PROCEEDINGS OF THE

International Conference on Legal Medicine from Cluj, 3rd edition

(Cluj-Napoca, Romania, 1-4 October 2020)

Editors
Costel Vasile SISERMAN
Cristian DELCEA

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INDEX

FOREWORD

The Forensic Institute of Cluj-Napoca organizes in 2020 the 3rd edition of The International Conference on Legal Medicine from Cluj, during 1-4 October 2020 in Cluj-Napoca, Romania.

This edition gathers specialists in the domain of forensic medicine from the country and from abroad, together with specialists from psychology, psychotherapy and clinical supervision.

On the occasion of this event, interdisciplinary topics are discussed, in fields related to the forensic field (medical, legal, human and penitentiary sciences), the general objective being to encourage the local and national community to participate in the development of the scientist-practitioner model in forensic medicine. The scientific contribution of specialists in the domain contributes to the innovation of scientifically validated working tools in the field.

Transdisciplinarity is also a key element in all fields, thus the participation of practitioners and specialists from other theoretical and research fields only adds value to this collection of manuscripts, which is *The Proceedings of The International Conference on Legal Medicine from Cluj, 3rd edition.* This volume thus collects some studies that are accepted to be presented in the International Conference on Legal Medicine from Cluj, 3rd edition, considered to be the most relevant for the scope of this event.

The volume thus brings together interdisciplinary topics related to the forensic, legal medicine domain (medical, legal, human sciences and penitentiary studies) to encourage the local and national community to participate in the development of the scientist-practitioner model in forensic medicine. Our goal is to convene researchers and practitioners in the fields of medicine, law, penitentiary, psychology, etc. to contribute to the benefit of our community, giving scientific robustness in our forensic activities.

All the papers registered in the conference are first analysed and reviewed by the conference Scientific Committee, and go through a blind peer-review process before being accepted to be published in the conference Proceedings.

The conference schedule includes sessions of studies presented by researchers, forensic doctors, lawyers, psychologists and sociologists from all over the country and abroad, covering a wide range of current topics for the discipline of forensic medicine and psychology. This event is an exceptional one both due to its scientific content and its organization and has as objective to become a tradition for the field of forensic medicine in Romania.

Associate Professor Costel Vasile SISERMAN MD, PhD, MSc
Associate Professor Cristian DELCEA PhD

Difficulties of Forensic Analysis of Postoperative Complications of Surgical Diathermy

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Abstract

The increase in responsibility of the medical-surgical act, introduced by the scientific and technological progress, popularized sometimes at an unrealistic level, constitutes one of the current causes that led to the avalanche of accusations of medical malpractice. Within these, postoperative complications play an important role. The present paper aims to present one of the complications of surgical diathermy (secondary diffusion of an unknown, uncontrolled, at distance, of electric current – SDUUDEC), in relatively common cases (cholecystectomy, hysterectomy, laparoscopic biopsy, adhesiolysis in peritoneal adhesion syndrome), focusing on principles of forensic analysis.

Keywords: medical malpractice, electrocoagulation, two-stage complications, deviations

1. Introduction

Since Bovie introduced in surgical practice the technique that uses electric current for dissection/coagulation, based on diathermy (the therapeutic method consisting in raising the temperature of some internal organs with the help of high frequency currents), a series of incidents and complications was reported, some belonging exclusively to the principles of the technique, which have not yet been fully solved. In practice, they are more common than reported, as up to a two-thirds percentage are not known/recognizable or are incorrectly attributed to other causes [1].

There are several types of electrode and circuit configurations: monopolar (the most popular nowadays) and bipolar, which is mainly represented by an electrode hook, used to perform electrocoagulation and electro section, the action being dependent on the heat generated (Cutting – the electrode touches the tissue and a high power density is applied to vaporize the water content of the tissue; Coagulation – vaporization explosive, but producing a thermal coagulation; Dissection; Lightning – the electrode is kept away from the tissue, and in the air space between the electrode and tissue, ionized, is a discharge of an electric arc – useful when monitoring the haemostasis of a bed bleeding diffusely) [2].

Such effects are possible due to the small contact surface of the instrument, the surface that concentrates the electrical flux and generates heat at the place of penetration into the tissue (Since the heating rate is proportional to the square of the electrical density or close to the peak of the sample). Based on this information, the following features can be presented:

- when the coagulation is applied on a ductal element with almost constant diameter, the current coagulates it uniformly on a length of 1-2 cm;
- if the ductal element narrows or branches, coagulation will occur first not, at the place of application, but instead at the place of narrowing or branching. This is an unwanted effect, which in some circumstances can be dangerous.

After passing through the tissues, the current is captured by a passive electrode, the ground plate, which is the current outlet from the body. Through its large surface – at least 70 cm^2, it disperses the electric current, avoiding its overheating. It is placed in intimate contact with the patient's skin, in the area where the intervention takes place, in order to achieve a short circuit.

The bipolar circuit involves the use of electrodes of similar dimensions arranged in the forceps, the current path closing between the arms of the forceps. This type of circuit acts more targeted, the current passing through the tissue between the two electrodes, so that it is safer and accidental burns are very rare. Possible complications involve:

Electric shocks are a risk, especially when a grounding pad is not used and the current is scattered randomly throughout the body, creating the build-up of static electricity. Shocks may be felt by the patient if there is contact with grounded objects such as nearby metal or metal on the treatment table. Shocks may also be delivered to grounded people nearby, including the practitioner.

Burns may occur in the presence of flowing oxygen or when flammable cleansers such as alcohol are used. The use of non-flammable cleansers such as povidone-iodine or chlorhexidine may eliminate the risk. It may also occur after the use of aluminium chloride solutions that contain alcohol.

Electrical burns may occur if a patient is in contact with a grounded object, creating a low-resistance path that concentrates the current in a small surface area. Avoiding placement of the grounding pad over metal implants, scar tissue, and bony prominences, as well as ensuring good contact between the grounding pad and the skin, will minimize the risk of burns. Return electrodes should always have full contact with the skin and be placed on the same side of the body and close to the side where the procedure is performed. To prevent unwanted burns, the skin is cleaned and a conductive gel is used to establish contact with the return electrode.

Eye injury may result from sparks or direct thermal injury when electro-surgery is used near the orbit. **Electromagnetic interference with** implantable electronic devices is a much-discussed risk of electro-surgery when using the instrument directly over the device.

Uncontrolled, unknown, at distance, secondary diffusion of electric current – SDUUDEC **–** including channelling (penetration of current beyond the target site, usually narrow, when followed by a wide base), direct coupling injury (transfer between two conductors – usually between the electrode and another surgical instrument) or capacitive coupling injury (migration of the current not through the tip of the instrument, but along its length, in conditions of loss of insulation) – *migration of electrical power* on paths of minimum electrical resistance and realization of the forecasted electric discharge (for the purpose of electrocoagulation/sectioning) at a distance from the place of application – is the consequence appearing on the body taking over the electric current following paths of low electrical resistance – derivative pathways – most often vascular – the blood vessel, through its liquid content, being very good conductor – which will produce the desired initial effect (electrocautery – coagulation) by electric discharge/voltaic arc – at a distance from the place of application (possibly injuring the operator's hand, too).

These type of lesions (thermal lesions), produced at a distance, may appear outside the visual field of the surgeon or morphologically unapparent at the time of its occurrence. Electric current can cause direct damage in case of contact between instruments and tissues – most often of sectioning type – respectively of thermal eschar type (by remote discharge of the voltaic arc) or ischemic necrosis (by vascular coagulation and consecutive ischemia, by subsequent stopping of the supply with blood in the served territories, which leads to the appearance of a focal necrosis of the vessel/duct/intestinal wall), with a dry, non-bleeding, supple appearance, possibly initially macroscopically unapparent or, at most, appears only as a whitish or brown area – electro – thermal). The area affected by the thermal effect of the electric current – the scale thus produced – from the vessel wall/duct/intestinal wall is delimited within a few days

(similar to any ischemic burns/necrosis), and can be cured (given the small size), but if the repair processes fail to replace the necrotic tissues, there is a breakdown and subsequent perforation – in two stages. [3]

In conclusion, an injury of migration of the electric current, non-perforating per primam, can be either of the thermal escarpment type – which can be cured or a rupture can occur and later a perforation in two times; or an ischemic necrosis, a consequence of vascular thrombosis, produced by coagulation, by the migration of electric current on the blood vessel.

Both types of lesions appear immediately after the formation of their morpho-lesional substrate (thermal coagulation, thrombosis), with minimal or no macroscopic changes (which makes them unrecognizable), and only by their evolution to necrosis suffering alterations in the appearance of normal structure. Intraoperatively, such lesions are impossible or very difficult to observe, especially since they are located outside the operating field, respectively having very small dimensions.

In contrast, if a direct intraoperative perforation occurs, by direct contact with the electrode hook, it would most likely lead to the immediate (and not subsequent) perforation of a blood vessel/intestinal wall etc. and would have immediately generated a significant haemorrhage, or in case of perforation of a bile duct, the bile would have leaked, also easy to spot intraoperatively, or by externalization on the drain tube in the following postoperative hours or the appearance of florid manifestations specific to a coleperitoneum, and in case of perforation of a cavitary organ – duodenum/intestine/colon – an orifice with intestinal contents would appear – all these are very easy to identify by the surgeon and lead to search and the identification of the continuity solution [4].

2. Materials and Method

We selected from the personal case studies, four cases demanding forensic analysis, in different stages of evaluation/re-expertise (initial assumptions, first or new forensic expertise), in criminal investigation or civil court cases, at that time. Their common indicator is represented by surgical acts in the abdominal sphere, followed by the favourable initial postoperative evolution, followed by deterioration and the need for a new surgical intervention, on which occasion they were identified as the cause of aggravation of new lesions, possible complication associated with the first surgery.

We present a brief history of the case, the technique and the initial intraoperative findings and those found during the new intervention, the forensic interpretations offered and the particular observations of each case, supporting the principles of analysis and contradiction necessary for proper evaluation.

2.1 Case no. 1

A 7-year-old child, with nephrotic syndrome resistant to chronic corticosteroid therapy, underwent diagnostic surgery on March 29, 2xxx. Laparoscopically, the left colic angle was taken off, the dissection in the left renal lodge until the kidney was highlighted, which is biopsied at the level of the lower pole. The child's evolution post operation was normal, presenting only the manifestations of the basic disease. In this case, the patient benefited from monitoring and postoperative treatment correctly indicated and administered. Four days later, 02.04.2xxx: the general condition altered, the abdomen was much relaxed in volume, important pneumoperitoneum and hydroaerial levels (empty radiography), with parietocolic and retrovesical fluid (ultrasound). The patient was re-hospitalized in an emergency regime, finding perforation, with unevenness, non-bleeding edges, on the descending colon in the vicinity of the postero-lateral splenic angle, with a diameter of 1 cm, through which the intestinal contents

are externalized. The perforation was sutured, but the evolution was unfavourable, death occurring 5 days later.

The forensic conclusion was: *the death was a consequence of multiple organ failure as a consequence of a colon perforation with generalized faecal peritonitis. Colon perforation could occur during laparoscopic surgery for remove biopsy - kidney - from an organism with cortico-dependent nephrotic syndrome. Between the instrumental perforation of the colon and death there is a direct causal link conditioned by the failure and timely treatment of the colon perforation produced by instrumental manoeuvres.* The penal indictment of the operating doctor for the crime of homicide contains as motivation the above conclusions. The following elements of interest necessary for the correct and complete assessment of the case are presented:

- the biopsy indication and the approach used are the recommended practices.
- the operating doctor has the necessary qualification and experience, and the intervention was practiced in conditions of adequate endowment of the medical unit.
- the operation technique was the current one used for this type of interventions.
- without finding any intraoperative incident by any of the members of the operating team (remember that in the case of laparoscopic interventions it is possible to follow the operation on a monitor – by the other people in the operating room).
- in this case, the lesion that was the basis of peritonitis was located on the postero-lateral face of the splenic flexure – away from the operating field, outside the visual field offered by the laparoscope chamber, away from the incision lines and the biopsy site.
- the location of the lesion at a relative distance from the incision, outside the operating field (strengthens the lack of direct damage).
- the location of the lesion on the latero-posterior face of the colon (outside the visual field provided by the laparoscope – impossible to identify intraoperatively).
- use of electro-cautery – intraoperative electric scalpel (which implies the possibility of electric current diffusion – unpredictable and uncontrollable incident).
- absence of intraoperative identification of any lesion secondary to electro-cauterization,
- absence of spillage of intraoperative intestinal contents (attesting the absence of any direct intraoperative lesion).
- favourable initial postoperative evolution, persistent for 4 days (which shows the absence of peritonitis immediately postoperatively – and strengthens the direct production of the lesion).
- the appearance of recent peritonitis (rare deposits of fibrin and fluid with the appearance of intestinal contents, not modified, purulent, without adhesions or cloazonations.) identified at the time of the next intervention (performed 4 days later) – (which attests the perforation of the intestine at a distance from the initial surgery).
- the appearance of the lesion identified at necropsy (irregular, fractured and non-bleeding edges) which shows that it is not a wound produced by direct cutting, but by the evolution of possible thermal scarring or ischemic necrosis.
- reactivity and limited regenerative capacity of the disease and chronic therapy outlined the causes, conditions and circumstances, that contributed to the unfortunate evolution of the case: the incision of the peritoneum with electrocautery could generate an uncontrolled, at distance, electrical current through diffusion on vascular ways, which induced a thermal eschar and/or thrombosis of these vascular pathways with the appearance of a possible necrosis of the intestinal wall, which against the background of marked decrease of reactivity and regenerative capacities, healing and anti-infective defence, too, has progressed to intestinal perforation.

Against the background of hypoproteinaemia in nephrotic syndrome (decreased blood protein leads to tissue edema and does not provide the substrate for restorative synthesis), but

also the limitation of inflammatory capacity (which associates in the early stages common steps with those of healing processes) [4], the body could not initiate efficient healing processes that would have blocked the evolution towards perforation. We reiterate that these lesions do not have compulsory perforating potential, the evolution being able to be made towards complete recovery-healing of the initial lesion, only in some cases the perforation appearing.

The serious evolutionary potential is dictated by the body's inability to trigger these repair processes in time and in an efficient manner, against the background of a systemic energy (decreased reactivity) or local complications generated by pathology. Once the diagnosis was established, based on clinical and imaging elements, surgery was promptly performed.

2.2 Case no. 2

A 34-year-old patient, multidisciplinary diagnosed, with lithiasic cholecystitis, on 26.02.2xxx benefited from laparoscopic cholecystectomy, according to modern recommendations. There were no contraindications – the intervention took place without incident, without intraoperative biliary extravasations or at the end of the intervention, which possibly raised a suspicion of biliary injury; the subhepatic space was routinely drained.

The postoperative evolution was normal, with serohematic drainage approximately 50ml (at 24 hours, without bilious appearance), drainage that was suppressed, and the patient was released in good condition on 27.02.2xxx. On 06.03.20xxx he was re-evaluated, no symptoms were found (absence of spontaneous abdominal pain and palpation of the abdomen), and without pathological elements at the clinical examination.

On the morning of 07.03.2xxx he called the Ambulance for abdominal pain, and was hospitalized with suspected renal colic. Only on the morning of 08.03.2xxx (after about 24 hours) emergency surgery was performed, with the suspicion of acute peritonitis and exploratory laparoscopy, lavage and multiple drainage was performed, finding a lateral thermal lesion of the choledochal canal; a laparoscopic suture and an endoscopic prosthesis of the lesion ware performed.

The patient addressed the Monitoring and Professional Competence Commission for Cases of Malpractice – *the Commission*, accusing the incorrect choice of approach for cholecystectomy, as well as the postoperative complication as due to improper handling of surgical instruments, concludes that the biliary tract injury was perforated, and the fact that it was produced intraoperatively represents the very proof of an act of malpractice.

The forensic evaluation assessed the following: The intraoperative description, is suggestive for a thermal scale; In fact, the perforation of the choledochus could not be mechanical, direct, or consecutive to the contact with the cutting electrode, but could have occurred only as a result of SDUUDEC.

The arguments that support the production of perforation after surgery as a result of an uncontrolled, at distance, diffusion of electric current excluded at the same time the perforation of the choledochus of mechanical nature or by direct contact electrode/choledochus produced during the manoeuvres of the first intervention:

- no surgical accident reported intraoperatively was found in the conditions in which the laparoscopic intervention is followed by the whole team of doctors;
- no secondary lesions to electro-cauterization were identified intraoperatively;
- the lesion could be located outside the visual field offered by the laparoscope (considering that the viewing angle is about 60-70 degrees compared to the naked eye which has about 120 degrees, and the magnification of the laparoscope camera limits the operating field to only a few cm^2);
- the initially constituted lesion was impossible to identify intraoperatively and due to its non-specific aspect and difficult to individualize;

- the absence of intraoperation bile overflow contents attested the lack of direct intraoperative injury;
- the absence of postoperative biliary drainage supported the absence of intraoperative injury;
- the favourable initial postoperative evolution for 10 days showed the lack of peritonitis immediately – and strengthened the subsequent production of lesions;
- the appearance of recent peritonitis (indirectly sustained by practicing a suture per primam of the choledochal lesion – procedure prohibited in the case of old lesions or with adjacent infection, absolutely common in perforations with an evolution of 10 days, as Commission assumed) at the time of new intervention (performed at 10 days later), which attests the perforation of the choledochus at a distance from the first intervention,
- the appearance of the lesion that allowed a limited suture, therefore without the aspect of cross sectioning, shows that it is not a wound produced by direct cutting, but by the evolution of possible ischemic necrosis (vessel thrombosis – thrombosis produced by current diffusion), or thermal eschar by uncontrolled diffusion of electric current).
- the aspect of the solution of continuity of the choledochus that allowed a limited suture, which pleaded for a lateral lesion of extrahepatic bile ducts Strasberg D (as it is known in the literature and practice) identified during the new intervention, is in total contradiction with the possibility of direct instrumental production (which would have induced aspects of the wound with clear edges, with quasi-sectioning).

As can easily be seen, the Commission has not established the imputable act, the damage, the causal link between them, respectively the value of each of the factors simultaneously competing in establishing the causal relationship between the incriminated medical act as *defective* and injury (anyway, unspecified).

The elements that support the fault were: the deviant behaviour from the professional standard that caused harm to the patient (with the mention that we do not know what was the damage assumed by the Commission or the motivation of the undoubted assessment, implicit in the absence of, that the injury was a consequence of negligent medical care), which was the usual and standardized practice (legislated – guidelines – or recommended) and what consisted in non-compliance with this practice – the concrete act that constituted the deviation from good medical practice (e.g., improper handling of medical instruments, incorrect establishment of the operating periods and, more specifically, which tools were used incorrectly, for example: incorrect placement of trocars, incorrect use of video camera, light source, wrong dissection of interposed structures, wrong handling of the electrode hook, wrong traction of the gallbladder, wrong dissection of the gallbladder, etc.) and how this act produced the result – choledochal perforation.

2.3 Case no. 3

A 44-year-old patient, clinically-preclinically, multidisciplinary diagnosed, with multiple uterine tumour formations – uterine fibromatosis, whose radical cure, based on the patient's age, was the surgical excision of the uterus.

She benefited from laparoscopic surgery on 04.03.2xxx: After bipolar electrocoagulation and manopolar sectioning of the bilateral mesosalpingia, the anexal pedicles, the round and uterosacral ligaments, the uterine and cervicovaginal arteries, total hysterectomy was performed with bilateral sal vaginal discharge.

Control of the peritoneal cavity and the remaining uterine lodge did not identify pathological content. Slope peritoneal drainage was performed with externalized drainage tube. She was discharged from the hospital, after a simple, favourable postoperative evolution, with

resumption of intestinal transit, in the absence of externalization of any abdominal drainage, on 7.03.2xxx.

She returned, 48 hours later, presenting faecal content in the vagina, and the intervention took place on 11.03.2xxx: the presence of a sigmoid-vaginal fistula included in a pelvic inflammatory block following a perforation of the sigmoid, with a lesion of 1 cm on the posterior wall of the vaginal trench, and at the level of the sigmoid loop hole 4-5 mm (*thermal lesion*). Temporary colostomy and, later, colostomy removal, were performed in sequenced operative schedules.

The initial forensic evaluation assessed the following: *it resulted that during the laparoscopic operation for total hysterectomy an incident occurred in the manipulation technique of the electrocoagulation instrument (thermal damage of the sigmoid loop) ... It resulted that during the laparoscopic gynaecological intervention there was a technical deficiency in handling of the electrocautery, which was not recorded in the operating protocol... There is an indirect causal link between the incident of laparoscopic surgery resulting in abscess and colo-vaginal fistula and the consequences of repeated interventions of necessity (''temporary colostomy'' and ''colostomy removal''), followed by scar sequelae of the abdominal anterolateral wall.*

The indictment of the operating doctor for the crime of serious body injury through fault contains as a motivation the above conclusions. The following elements of interest necessary for the correct and complete assessment of the case are presented. The indication for hysterectomy and the approach were those recommended and the ones usually practiced. The operating doctor had the necessary qualification and experience, and the intervention was performed in conditions of adequate equipment of the medical unit.

The operating technique was the current one used in this type of intervention, achieving natural operator time periods, without finding any intraoperative incident for any members of the operating team (remember that in the case of laparoscopic interventions it is possible to follow the operation on a monitor, other people in the operating room can do this). The following information was taken into consideration:

- the absence of any intraoperative discovery of any possible sigmoid damage or spillage of intestinal contents in the peritoneal cavity;
- the presence of digestive tolerance and the resumption of intestinal transit 2 days after the operation;
- the absence of peritoneal irritation signs 4 days after the operation;
- the postoperative evolution inconsistent with the possible diagnosis of faecal peritonitis, which would have altered very quickly and would have endangered the patient's life;
- the minimal treatment applied during this period that cannot influence the evolution of a possible already present faecal hyper-septic peritonitis; it is believed that the sigmoid perforation found at the operative intervention from 11.03.2xxx occurred at a distance from the initial operative act, at there were no signs or symptoms, at which time there were firm indications of simple uncomplicated postoperative evolution.

2.4 Case no. 4

A 42-year-old patient with a history of multiple abdominal interventions (cholecystostesis with cholecystostomy, followed by subtotal cholecystectomy), complained of pain and the sub-occlusive phenomena, for which imaging investigations, ultrasound and computed tomography are performed, which in the initial interpretations revealed only changes compatible with an abdominal adhesion syndrome and its consequences.

Against the background of persistent symptoms and slow progressive aggravation, a new surgery is decided, performing total cholecystectomy, about 2.5 years after the first intervention.

Subsequently, at about 5 months, the symptoms return and, against the background of the failure of drug treatment, laparoscopic surgery is performed at another hospital. The inspection showed a close process of supramesocolic perivisceritis, large omentum, transverse colon, enteral loops adhering to the anterior abdominal wall.

Careful adhesiolysis with scissors and bipolar forceps is performed. There was a block of intestinal loops under the costal rim. Adhesiolysis is practiced until the presence of a loop tightly adherent to the anterior abdominal wall, below the costal rim, which couldn't be released. Due to the high risk of perforation, it was decided to abandon the adhesiolysis at this level. Relatively favourable evolution for a few days followed by the worsening of symptoms at about one week (fever, chills, abdominal pain), which forced a new surgical operation two weeks later – median umbilical iterative celiotomy.

At a *subhepatic level there was a conglomeration of intestinal loops, closely adhering to the parietal peritoneum, which was also found during adhesiolysis. At the attempt of viscerolysis, a cavity from which sero-purulent content was externalized in a minimum amount appeared, delimited by two ileal loops and the antero-lateral parietal peritoneum, from which a coloration compress of approximately 25 cm is extracted at the distal extremity. The space in which the first compress was located, under the visceral face of the liver and above the colonic angle, had bilious content. A solution of transverse continuity with fractured edges and areas of fibrosis is found after viscerolysis at the level of the parietal peritoneum of the DI approximately 2 cm distal to the pylorus. Multiple (3?, 4?) enteral continuity solutions were also identified* (lacking descriptive details, photographic material or electronic recordings), *on a segment of about 40 cm, after* performing duodenoraphia, eneteroraphy and segmental enterectomy with LL entero entero-anastomoses. Histopathological examination: *fragments of richly vascularized connective-adipose tissue, showing intense areas of cauterizing necrosis and ulcerations on the surface, with rich fibrino-hemato-leukocyte exudate and abundant granulation tissue, acute enteritis with the presence of numerous acute inflammatory infiltrates and submucosa and marked edema in the submucosa, associated with fibrino-purulent peritonitis with the presence of large necrotic-hemorrhagic areas in the subserosal and partially in the own muscle and abundant granulation tissue in various stages of evolution (7-10 days), sometimes with micro-vascular thrombosis and rare multinucleated giant cells.*

The reinterpretation of the initial computed tomography examination supported the existence of a textiloma designed sub-hepatically. The doctor incriminated by the patient is the surgeon who performed cholecystentesis and cholecystectomy, based on the statement of the second surgeon – who intervened 5 months later, who placed the entire lesion procession identified on the occasion of the second intervention as being caused by textilom. The forensic evaluation mentioned the following:

- practicing the surgical act of cholestectomy in difficult working conditions, consequence of the adhesive syndrome generated by iterative inflammations, involving neovascularisation and diffuse haemorrhage in the operating field, difficult recognition of modified anatomical structures, intraoperative bleeding, favoured – due to deficiencies metering of the use of soft material – when omitting the evacuation of the entire used haemostatic textile material, with the appearance of an evolving textiloma;
- adhesolysis performed 5 months later is likely to lead to significant devitalisation following intraoperative manipulation and sectioning, and possible side effects of using electrocautery.

The possible erosive mechanism of the foreign body on the enteral loop could not be sustained:

- in the absence of the typical chronic inflammatory reaction, of a foreign body at this level;

- nor by the plurifocal aspect of the perforations, with the simultaneous detection of several perforations in different anatomical loci;
- nor by the histopathological aspect of one of the perforations (the only one available for histopathological examination) of recent type, with adjacent appearance of fibrino-purulent peritonitis and necrotic-haemorrhagic areas and 7-10 days old inflammation, detected at 13 days laparoscopic postadhesiolysis; on the other hand;
- considering that the temporal asynchrony between the surgical act from 09.07.2xxx and the finding of intestinal perforating lesions 14 days later, is highly super imposable on the sequence of surgeries and the histopathological aspect (perforations found at 2 weeks post-laparoscopy that associated wide debridement);
- and the high plausibility of the analogy of the detected lesion type and the possible incidents associated with laparoscopy;
- progressive worsening of symptoms during this interval;
- solving one of the perforations mentioned by suturing per primam (method that proved to be effective) in order to support the recent character of the perforation.

From the submitted documentation one can underline the fact that the duodenal perforation occurred as a result of the erosion of the intestinal wall by the foreign body, but certainly, at least one of the enteral perforations has a recent character, in full process of recent post-cauterization changes (therefore, the more likely, the consequence of the adhesiolysis processes performed about two weeks earlier). Deficiencies in the provision of medical care found in this case resulted in the following conclusions:

- soft sanitary material left intra-abdominal after surgery for cholecystectomy;
- non-diagnosis by computer-tomography examination, circumvention that contributed to the delay of the intervention, but also to the decision to practice a subsequent minimally invasive surgery;
- practicing a laparoscopic intervention 5 months later, on an abdomen with a rich adhesion process, previously known and documented imagistically, with specific diagnosis in the same direction - likely to increase the risks (especially perforative, immediate or late) associated with manoeuvres of laparoscopic adhesiolysis;
- the production of a/some perforations of the digestive tract in the conditions of practicing a laparoscopic surgery, in the conditions of a relative contraindication of this approach.

3. Discussions

Any medical act, no matter how innocuous and common it may seem, involves risks in medicine, expression of the development limits of medical sciences and adjuvant technologies, but also the unpredictable reactivity of biological and individual anatomical-topographic variations associated with changes in pathology.

Incidents and side effects of medical treatments can occur in any therapeutic scheme, technique or in any patient, and cannot be predicted or certified in a particular case, only statistical data can be provided. For specific cases, the analysis of the causes that led to the concretization of these known and cited incidents may or may not identify factors with favourable/circumstantial value in their genesis.

The present cases raise a thorny issue in surgery, that of undetected or undetectable intraoperative iatrogenic visceral lesions, most often thermal lesions, most often the consequence of the use of monopolar electrocoagulation.

A. Ferriman presented in BMJ the report of 19 medical insurance companies from the USA that debated laparoscopic lesions in dispute in 535 patients, a report that found that thermal lesions of the main bile ducts gained the first place (followed by the intestinal ones) and

unfortunately two thirds of the lesions are not recognized intraoperatively, which amplifies the severity of complications. [4] The forensic examination must identify the interference or not of any known factors, in order to have an augmentative potential on the rate (statistics!) of occurrence of subsequent perforations and to establish their possible causal role, respectively if the medical practice included diligence in order to reduce the eventual concretizations of this risk.

It is important, even essential, that in the complete and especially correct analysis of the establishment of the value within the causal relationship, to evaluate the possible unpredictability of the injury constituted by SDUUDEC, which can be the basis of legal non-imputability.

Frequently, the consecutive consequences of SDUUDEC (and with great similarities, and those produced by devascularisation) cover, from the evaluation perspective of the medical care provided, the aspect of fortuitous incident due to lack of real possibilities of absolute prevention, by late postoperative complication, which does not belong to clumsiness/ignorance/inexperience, but exclusively to the technique and equipment limits that are not infallible in absolutely preventing the production and unwanted effects.

Given that most thermal lesions are unnoticed intraoperatively during direct inspection, small, clinically move in the postoperative period unpredictable, but well-known to medical practice, without the possibility of recognizing their occurrence intraoperatively, their consequences (either by vascular ischemia or at distant thermal eschars, either by devascularisation, with the subsequent slow-progressive punctual-focal necrosis of the visceral wall, which leads to the loss of its tightness, manifested by perforation and extravasations of content and the appearance of peritoneal irritation symptoms) are assumed risks.

The consent of the informed patient is an additional defence of the doctor in case of such a complication about which the patient was informed preoperatively. By simultaneously meeting specific criteria for incidents of fortuitous medical practice (belonging to the nature of things and not to guilt) – diligence, unpredictability, impossibility of immediate detection – forensic conclusions should seek and highlight the elements of denial of medical practice as fault, and to make the appropriate evaluation, consequently, as an incident of the medical act (*medical act of necessity*, recommended and effective), distinctly framed in the absence of illicit conduct, as an incident known to the medical practice that can be constituted regardless of the doctor, medical unit (similar with *the practice of the neighbourhood*, in which doctors with the same training and equipment would have acted similarly, or differently, and if this would have led to the same, or another, result, in the same circumstances), technique, diligence, equipment, incident belonging to the development limits of current medical sciences (the medical care in the case being based on the existing of a recommended practice and without possible deviations from it).

Conclusions should be drawn after fully assessing the causal value of all factors in the causal relationship (unpredictable, subsequent, late and unforeseeable postoperative complications, dependence and unpredictability of individual reaction – many of these lesions do not end up in constitute perforations, the repair processes of the body healing the burn or the ischemic area initially).

Such an incident, known to medical practice and relatively common, can be prevented only by measures related to the possible use of a bipolar current, which is easier to control, which limits the risk of long-distance migration, but without cancelling it, but also by the most judicious use of electrocautery (especially in active inflammatory adhesive blocks, condensed on small surfaces), by choosing the right abdominal approach, based on known indications and contraindications (although, even when appropriate, although it can limit the incidence of such incidents.

It can generate such complications, because, regardless of the approach, the detachment of the structures and the excisions are done by the same dissection, sectioning and haemostasis manoeuvres, by using blunt, sharp tools, the operator's fingers, electrocautery, ligation/clipping and haemostasis).

Frequently, no lesions have been described or identified intraoperatively to support the direct, instrumental injury of any of the visceral structures – typically generating lesions with sharp edges, immediately visible intraoperatively, with immediate manifestations (bilirubin, haemorrhage, dung fluid leakage), all the more so as the intraoperative laparoscopic intervention is followed by the whole team of doctors, with the magnification of the images; on the other hand, it is necessary to mention the limitation of the laparoscopic field precisely because of the magnification, and the reduced possibility of wide exploration.

No lesions secondary to electro-cauterization were identified intraoperatively – perforation, eschar; possible and due to their non-specific and difficult to individualize appearance, as well as spillage of biliary/intestinal contents or intraoperative haemorrhage, which attests to the lack of direct intraoperative lesion, consistent with the absence of postoperative pathological drainage and the favourable postoperative evolution for several days (generally at least 2, on average 4).

The appearance of recent peritonitis, at the time of new interventions, attests that the perforations occurred at a distance from the first intervention, and the appearance of lesions showing that symptoms were not caused by direct cutting, but by the evolution of either ischemic necrosis), or of a thermal eschar (by SDUUDEC).

On the other hand, it was shown that the infectious/inflammatory processes subsequent to the perforation, modified the aspect of the perforation, the lesion mechanism on the macroscopic characteristics, and can no longer be sustained through this; histopathological examination may bring additional elements of dating the lesion.

Also, literature unanimously mentioned that such lesions are almost impossible to predict, anticipate, prevent or recognize intraoperatively, only careful postoperative follow-up being likely to confirm/refute their production [4]

The clinical mute character in the lesion postoperative period initially determined by SDUUDEC contributes to the classification in an unpredictable and unpredictable event, but well-known to the medical practice, without the possibility of recognizing its intraoperative appearance and in the immediate evolution.

Practically, only in the case of the perforation complication – after the necrosis of the entire wall in the affected area, respectively the elimination of the initial burn – it is possible to establish, retrospectively, the production of such a lesion.

The forensic analysis algorithm must also include the differential diagnosis, in the absence of elements with pathognomonic value, of absolute certification of the character of subsequent SDUUDEC lesion. Such lesions must be differentiated from postoperative visceral lesions that may occur through other mechanisms, some of which both fall into the sphere of error:

- *The sectioning* is immediately followed by the loss of its continuity and the leakage of content in the peritoneal cavity; this type of lesion is easily visible directly during surgery, and is highlighted by expression of drainage tubes in the postoperative period;
- *The accidental direct ligation* or *crushing* (compression between planes/instruments or clamping with forceps) of the viscera/duct – lead to a devitalisation of the wall in the injured area with the production either immediately or in a short time of a continuity solution with the same consequences. up and in addition with high risk of infection by microbial cantonment on devitalized tissues; upstream expansions may occur;
- *The devascularisation*, a consequence of the sectioning of the nutritive vessels during the surgical manoeuvres, has practically similar manifestations with the SDUUDEC lesions;

- *The obstructive periadventricular fibrosis* occurs as a consequence of inflammation (consequence of interventions in the neighbourhood, infection) which through subsequent healing/healing processes leads to an intense local fibrinogenetic process and the formation of obstructive-strangulating clamps, which include or stenosis the viscera, progressively – the solution continuity, through the mechanism of diastatic rupture, occurs upstream, at the site of suprastenotic dilation, compared to the presumed area of inclusion in fibrosis, never downstream.

4. Conclusions

Postoperative complications generated by the evolution to aggravation of consecutive SDUUDEC lesions, all the more surprising as the initial operative act took place without incident, respectively the initial postoperative evolution was favourable, without risks assumed in excess of the norm, most often require a new intervention surgery.

The descriptions in the medical documents, often lacking semiological precision (regarding the possibility of reconstitution by the given data of the production method), as well as the interference of the inflammatory-infectious processes consequent to the loss of intestinal tightness, for example, or the character of major urgency due to fudroaiante haemorrhages), together with the anamnesis data reported by the patient in contradiction with the recorded medical data, creates difficulties for the forensic expert in allocating the cause and the mechanism of lesion that led to the complicated evolution, but also for scoring possible deficiencies in the provision of medical care, by comparison with the recommended norm.

If a lesion of thermal eschar or post-trombotic necrosis (both consecutive SDUUDEC) occurs, only the postoperative follow-up is the only one able to detect possible lesions of the initial surgical act, which cannot be known – recognized intraoperatively and the evolution of which is in generally favourable, but with the potential for late complications.

These complications belong to an incident known to medical practice, being the consequence of injuries in two stages: post devitalisation or post electrocautery, inherent and implicit gestures of the surgical act, without being able to document, as a rule, the possible errors of surgical technique in their genesis.

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Oesophageal Fistula – Forensic Implications

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Abstract

Oesophageal fistula is a rarely encountered disease both in forensic practice and in professional literature. Two sudden death cases are presented in this paper, the first occurring secondary to an undiagnosed oesophageal-cardiac fistula of unknown origin, and the second a trachea-oesophageal fistula as implication of an undiagnosed and untreated squamous cell carcinoma. The information presented is correlated with high quality scientific literature. This paper highlights the need of addressing the lack of accessibility to quality medical care through the strengthening of the first line by financial and organizational optimization of the general practice and preventive medicine network, and also though the medical education in general population.

Keywords: sudden death, autopsy, trachea-oesophageal fistula, oesophageal atrial fistula, squamous cell carcinoma, etc

1. Introduction

Gastrointestinal pathology is a less frequent cause of sudden death, as compared to other disorders, such as cardiovascular ones. In some cases, gastrointestinal pathologies may remain undiagnosed and untreated, if the subject lives alone and hasn't got the chance of requesting medical assistance or if s/he refuses medical treatment [1]. Lethal oesophageal disorders are even less frequent, emergence including upper airway obstruction, due to tumours or foreign bodies, intraluminal bleeding due to vascular malformations, or perforation with fistula formation resulting in bleeding and sepsis. [2]

The oesophageal fistula is an abnormal communication between the oesophagus and the neighbouring organs (trachea, bronchia, lung, heart, large mediastinal vessels or tegument), the most frequent being the trachea-oesophageal or broncho-oesophageal fistulae. [3] The aetiology of the oesophageal fistulae changed permanently over the last 3 decades, as the iatrogenic, malignant or traumatic causes exceeded the inflammatory ones. 50% of the acquired fistulae are currently considered results of mediastinal neoplasms (tumours originating in the oesophagus, trachea, larynx, lungs, thyroid and regional lymph glands), and all have been reported as premises to the formation of an acquired oesophageal fistula (77% oesophageal tumours, 16% primary lung tumours. [4, 5]

2. Case Presentation

A rare case of a left oesophageal atrial fistula diagnosed during the autopsy procedure is presented to support the research presented. Clinical data of the first case presented include the following: The patient was a female aged, aged 62, with hepatic cirrhosis and residual CVA, with no personal pathology history of atrial fibrillation or neoplasia, who came to hospital with upper digestive bleeding demonstrated by hematemesis and melena, and also with minor TBI

as result of a fall. The patient was admitted with BP = 160/80mmHg, ventricular rate = 133/min, GCS-3p, and the biological tests revealed a severe post haemorrhagic anaemia with Hb-5g%, Ht-16,8%. The patient's condition remained severe, being hemo-dynamically unstable, death occurring within 3 days after admission.

The autopsy findings included the following information: Autopsy revealed minor trauma and traces of medical treatment (venipunctures). Internal exam highlights a major visceral anaemia, Aortic and coronary atherosclerosis, stomach with minimal sanguinolent discharge, bowels with melena contents. In the anterior wall of the thoracic oesophagus, in the sub-bronchial segment area, retro-cardiac, there was an oval-shaped laceration of 2/1cm with thickened edges, covered in blackish blood, originating in a 0.5 cm diameter perforation of the pericardium and of the left atrium's posterior wall. The pericardium also had a lacerating perforation on the left atrium's posterior face corresponding to the heart-penetrating oesophageal ulcer (see Fig. 2.1, Fig. 2.2 and Fig 2.3).

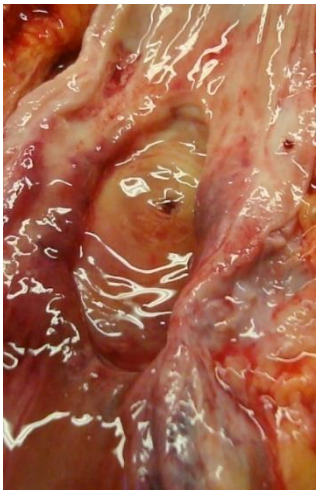

Fig. 2.1 Ulcerating perforation in the oesophagus

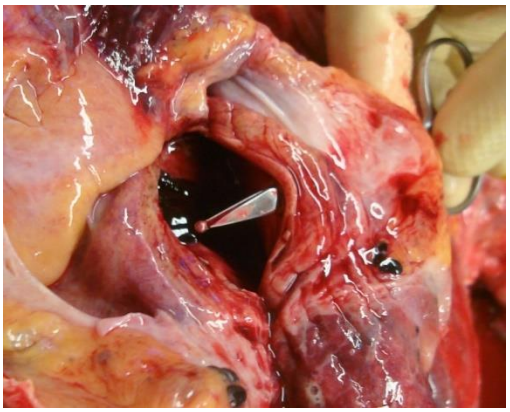

Fig. 2.2 Ulcerating perforation in the pericardium

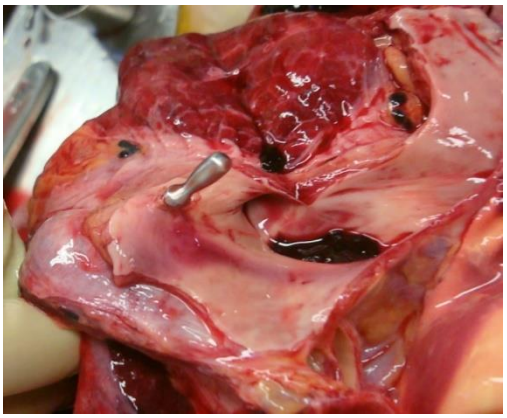

Fig. 2.3 Ulcerating perforation in the left atrium

The corroborated clinical and autopsy data allowed the establishment of the cause of death: acute cardiorespiratory failure due to perforated oesophageal ulcer in the sub-bronchial area, penetrating the left atrium with upper digestive bleeding and cardiorespiratory arrest, resuscitated.

The second case presented is of a man found dead at his home; the autopsy exam revealed an oesophageal tumour mass with tracheo-oesophageal fistula.

Clinical data include the following: The patient was a male aged 56 years, found dead at his home, with no personal pathology history known.

Autopsy findings: at the external exam cachexia was found, without any trauma sings on his head, body and limbs. The internal exam revealed stasis in organs, aortic atherosclerosis and purulent inflammation pneumonia. In the third caudal of the oesophagus an 8/4/2cm sessile was found, and a vegetative tumour mass of infiltrative, cauliflower-like appearance and whitish colour; anterior, at the base of the tumour implantation, a 1,3/1cm oval-shaped substance-missing area was discovered, creating a communication channel with the trachea. In the posterior wall of the trachea, at the tracheal bifurcation, there is an oval-shaped substance-missing area creating the communication channel with the oesophagus (Fig. 2.4, Fig. 2.5, and Fig. 2.6).

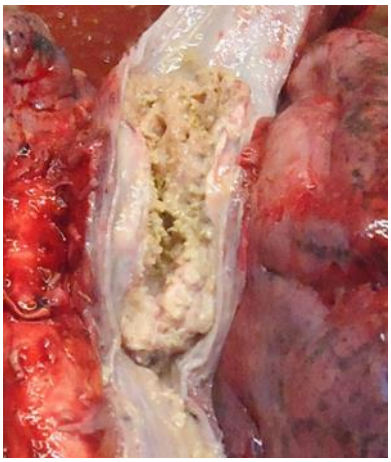

Fig. 2.4 Tumour mass in the oesophagus

Fig. 2.5 Tumour mass in the oesophagus

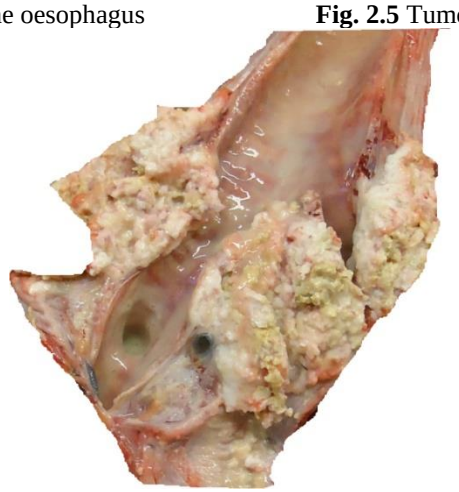

Fig. 2.6 Tracheoesophageal fistula

The histopathological diagnosis was based on atypia and invasion, the oesophageal wall featuring a malignant proliferation of squamous cells invading the external musculature (pT2), with necrosis nidi and moderate lymphocytic response.

The tumour was well differentiated, forming squamous pearls, keratinizing individual cells and creating intracellular holes (bridges), the neoplastic cells featuring an increased nuclear size (some multinucleated), hyperchromasia, pleomorphism and an increased mitotic rate with atypical mitosis (see Figures 2.7, 2.8, 2.9, 2.10).

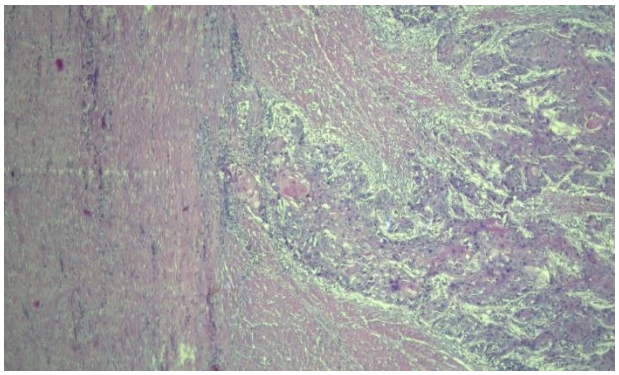

Fig. 2.7 Squamous cell carcinoma invading the external musculature (pT2). HEx40

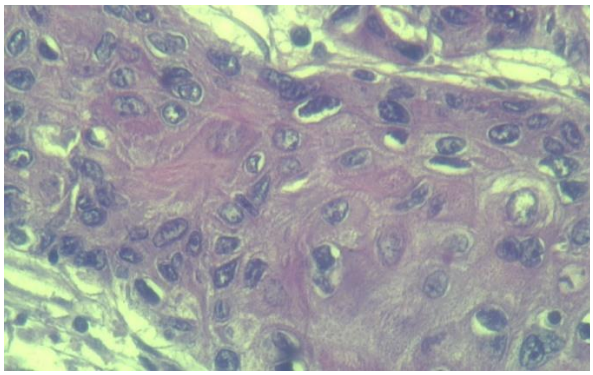

Fig. 2.8 Malignant keratinocytes with intercellular bridges. HEx400

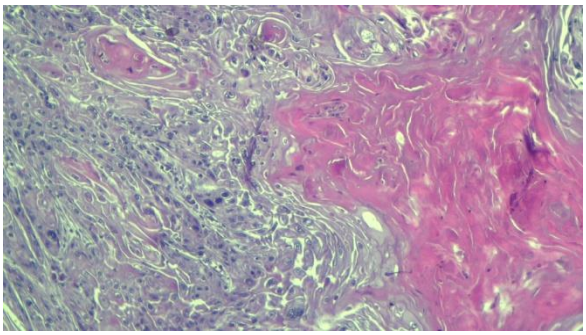

Fig. 2.9 Formation of keratin pearls, individual cell keratinisation and neoplastic multinucleate keratinocytes. HEx100

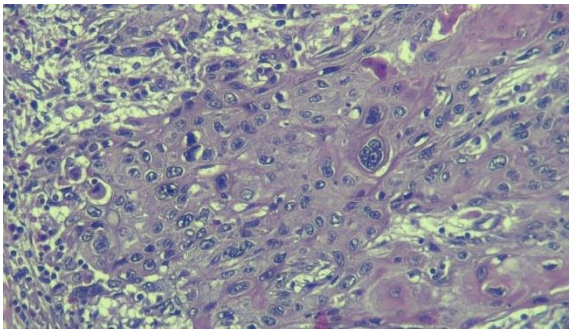

Fig. 2.10 Squamous cell carcinoma with multinucleate cells, individual cell keratinisation and moderate lymphocytic response with inlaid eosinophils. HEx200.

The corroborated clinical and autopsy data allowed the establishment of the cause of death: acute cardiorespiratory failure due to an oesophageal squamous cell carcinoma with tracheoesophageal fistula, complicated by purulent inflammation pneumonia.

3. Discussions

Oesophageal cancer is the eighth most common cancer type, and it is the sixth most common cause of neoplasm-related death worldwide. There are two oesophageal cancer subtypes: oesophageal adenocarcinoma and squamous cell carcinoma, the squamous cell being the most frequent, representing 88% of the total number of oesophageal cancer cases worldwide [6, 7, 8]. Oesophageal squamous cell carcinoma occurs predominantly in the middle third of the oesophagus, being followed by the lower third and, very rarely, upper third occurrences, our case being consistent with such incidence and topography.

The tracheoesophageal fistula is a fatal complication of the oesophageal cancer, the survival time of diagnosed patients being of approx. 8 weeks. [9]

In terms of histopathology, squamous cell carcinoma is characterized by the invasion of the neoplastic squamous cells in the same plate and in deeper layers. It may have multiple cell differentiation degrees, the most frequent being the well-differentiated squamous cell carcinoma, where keratin pearls, individual cell keratinisation and intercellular bridges occur, such aspects being common to the case histopathology exam. [10]

In the second case, purulent inflammation pneumonia in the lungs was found, as a direct complication of the tracheoesophageal fistula, which is also substantiated by the professional literature mentioning aspiration pneumonia and sepsis as main causes of death in patients with oesophageal cancer with tracheoesophageal fistula, despite secondary disseminations. [11]

Maciej Zechowicz presented the case of a 55-year old male admitted with syncope, dyspnoea, cough and cachexia. After having performed several investigations, he diagnosed the patient with oesophageal cancer and tracheoesophageal fistula with respiratory complications; the placement of an oesophageal stent considerably decreased the symptoms, yet the patient's condition worsened short after discharge, death occurring within 28 days. [12]

Non-tumorous causes leading to the formation of oesophageal fistulas include penetrating, perforating open injuries of the mediastinum, mediastinal local purulent processes, intake of foreign bodies (fish bones, small batteries), and HIV infection. Iatrogenic causes include: placement of oesophageal stents, atrial fibrillation ablation, oesophageal or tracheal endoscopy, oesophageal echocardiography, or tracheal intubation, percutaneous tracheotomy. [5]

The oesophageal-atrial fistula is defined as a communication between atrium and the lumen of the oesophagus and it has an occurrence rate of 0,1% to 0,25%, with a fatality rate over than 50%. The most accurate diagnostic method is contrast-enhanced thoracic CT scan and the required approach is immediate surgical intervention, if positive. [13]

This is a very rare complication of the medical procedures, having three possible iatrogenic causes and it is very hard to diagnose. [14] The most frequent localization of the oesophageal-atrial fistulas is in the left atrium, near the pulmonary ostium of the veins [9, 15, 16, 17].

According to professional literature, the left oesophageal-atrial fistula is a complication occurring secondary to atrial fibrillation ablation, but in the case one couldn't underline exactly what caused the occurrence of this fistula. Parth Rali described an oesophageal-atrial fistula case in the Respiratory Medicine Case Reports in 2017, a 58-year male with a history of atrial fibrillation coming to hospital for chest pain and hematemesis, his condition growing worse into sudden cardiac arrest. Investigations continued after resuscitation and CT angiography reveals an oesophageal-atrial fistula in the left atrium, and an immediate surgical procedure is performed based on this diagnosis. The patient died short after the surgical procedure. [9, 18]

Authors describe cases of aortic-oesophageal fistulae leading to massive bleeding in the upper gastro-intestinal tract with hematemesis, the gastric content spilling very rarely into blood circuit, with a fast evolution towards death. The most common cause of a primary aortic-oesophageal fistula is an atherosclerotic aneurism of the thoracic aorta (51-75% of total cases). [19, 20] The pericardial-oesophageal fistula is a rare condition with a high enough death rare, less than 70 cases being documented by the professional literature. Authors report a pericardial-oesophageal fistula caused by a recurring oesophageal tumour one year after resection of lower third oesophagus for oesophageal cancer. Professional literature has no other case report on a pericardial-oesophageal fistula with the same aetiology. [21]

Broncho-oesophageal fistula is rarely noticed in adults and it is caused by malignity in most cases. However, it could be produced by benign lesions, such as trauma or infection caused by mycobacterium tuberculosis, especially in endemic countries; nevertheless, formation of broncho-oesophageal fistula as a complication to TB is significantly rare. [22]

Ahn *et al*., have shown that benign broncho-oesophageal fistula in adults represented only 4,8% of the total broncho-oesophageal fistula cases, while malignant processes were 95,2% of total cases. [23] The lack of healthcare services in the rural Romania and long distances to the nearest healthcare facility, poor equipment in the existing healthcare facilities and also the lack of education in general and eventual limited expertise of the physicians in these areas may lead to the situations presented above. In the cases presented, patients did not undergo specialized medical investigations to identify the conditions resulting in their death, as demanded. [24]

Reluctance of senior people to go to specialized healthcare facilities for medical investigations, limited access to healthcare services and non-diagnostic by the medical staff in due time added their effects to the death occurrence. Accurate and fast diagnostic is of paramount importance in medical practice, as survival chances are minimal in case of lack of immediate intervention in cardiac-oesophageal fistula. [25, 26, 27]

Moreover, in case of squamous cell carcinoma with tracheoesophageal fistula, the diagnosis and treatment of the condition were impossible as the patient ignored the symptoms and did not go to a specialized healthcare unit, which resulted in death.

4. Conclusions

Oesophageal fistulae are conditions rarely mentioned by specialty literature and more rarely by forensic literature, most of them being complications of oesophageal cancer and atrial fibrillation ablation. The cases analysed in this paper, include two extremely rare sudden deaths, the first being secondary to an undiagnosed atrial-oesophageal fistula of unknown origin, and the second, with a tracheoesophageal fistula, being a complication of an undiagnosed and untreated squamous cell carcinoma.

This particularity of this paper resides in the extreme rarity of both cases in forensic practice, which is also confirmed by specialty literature. This paper highlights the need of addressing the lack of accessibility to quality medical care through the strengthening of the first line by financial and organizational optimization of the general practice and preventive medicine network, and also though the medical education in general population.

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Non-accidental Electrical Death

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Abstract

The low incidence of electrical deaths and an even lower rate of its non-accidental form determined us to advance the following study consisting of a series of six cases of violent deaths by electric shock with the deliberate connection of the victims' bodies to the electrical grid. The results of the study are correlated with data from scientific literature.

Keywords: electrocution, suicide, homicide

1. Introduction

In recent years, in Romania, out of all the violent deaths almost three quarters are accidental deaths – about less than a quarter (23% in 2018), suicides – with a downward trend and about 3% homicides [1]. As thanato-generator mechanism, the electricity action has a share of 1.6% being the cause of death in 1% of all suicides. Most deaths by electric shock are accidental, followed by rare suicides and extremely rare homicides [2].

There are many factors playing a determining role in the severity of the tissue damages and the physiological effects of the exposure to the electric current, including the parameters of the electric current (type of current, voltage, resistance, length of the event, current path) and biological factors related to the body [3, 4, 5].

The first death caused by an electric current was registered in France in 1879 when a carpenter was killed using 250 volts alternating current [6]. Twenty years later, the need to find a more human death than the execution by hanging, the electrocution was used a method of capital punishment, thus the death by electric chair was adopted for the first time in New York in 1899 for the prisoners "to die as pleasantly" as possible [7].

The low incidence of electrical deaths and an even lower rate of its non-accidental form determined us to advance the following study consisting of a series of six cases of violent deaths by electric shock with the deliberate connection of the victims' bodies to the electrical grid. The results of the study are correlated with data from scientific literature.

2. Material and Method

The study "Non-accidental electrical death" was conducted by an observational method based on a retrospective survey and analysing the forensic reports within the period 2005-2019 from Galati County Medico-legal Service. We found and selected a number of six voluntary deaths by electric shock presented in the following table (Table 1).

Table 2.1 Demographic, morphological and forensic data on non-accidental electrocution

No	Sex	Age	Contact	Current path	Voltage	Associated traumatic injuries	Toxic substances	Forensic form and investigation data
1	M	22	Bipolar	Linear-superior to inferior path (from hand to leg)	Low	Bruises, excoriation, 2nd degree burns Electric burns (coetaneous plan)	Blood alcohol concentration (BAC) – 2,10 g ‰ Drug Test – negative	Suicide - at home, in the bathtub; - mouth tied with a towel; - hands wired with electric cable conductors; - medicine tablets in the sink.
2	M	50	Bipolar	Linear-superior path (from hand to hand)	Low	-	Blood alcohol concentration – 0 g‰	Suicide - at home; - hands wired with electric cable conductors.
3	M	61	Unipolar	Linear-superior path (from hand to hand)	Low	Excoriations	Blood alcohol concentration – 0 g‰	Suicide - at home, after stabbing his wife.
4	M	46	Unipolar	Linear-superior – inferior path (from hand to hip)	Low	Excoriations Electric burns (muscular plan)	Blood alcohol concentration – 0,20 g‰	Suicide - at home; - hand wired with an electric cable conductor; - 3rd suicide attempt.
5	M	57	Bipolar	Linear-superior path (from hand to hand)	Unknown	-	Blood alcohol concentration – 0,40 g‰	Suicide - at home; - hands wired with electric cable conductors.
6	M	17	Unipolar	Linear-superior-inferior path (from hand to leg)	Low	-	Blood alcohol concentration – 0 g‰	Manslaughter - the victim touched the anti-theft window bars of a store connected to the electrical grid.

3. Results and Discussions

The results of this study were largely similar to those previously published, showing that suicides are relatively rare and homicides extremely rare. Out of the six cases presented, five are legally classified as suicide, and the sixth as manslaughter. We would like to point out from the beginning that we do not focus on establishing the legal classification, its determination does not fall within the powers of the forensic doctor, but it is his/her attribution to provide all available medical elements that can contribute to the legal classification of the offence.

Electrocution occurs among young and middle-aged males. In an attempt to find an explanation, experts see this as a reflection of the fact that men are more frequently employed in industries with a risk of electric shocks and are more likely to undertake home or garden improvements [8].

All suicide cases occurred inside personal homes and internal electric supply is used. The method used involved the use of cables, the victim removed the sleeve exposing the wires and winding them round the wrists, fact which indicates the voluntary action of the act. As for the type of electrical contact, there were two types of contact: unipolar and bipolar. Only low voltage power supply was used, in our country the most accessible source of power supply being the domestic current of 220 volts.

The worldwide electrical suicides using high voltage current have rarely been reported [9].

A voltage of 40 volts is considered life-threatening; moreover, cases of fatal electrical injuries for voltages between 15-40 volts were registered by specialty literature [10].

The alternating current is more dangerous than the direct one, leading to the death of the victims at lower amperage, to cardiac arrhythmias and tetanic contraction of muscles so that the victim cannot let go of the conductor in the attempt to rescue oneself. Alternating current is said to be 4-6 times more likely to cause death. The possibility of a fatal event often increases in the case of a longer contact of the human body with the conductor. For this reason, deaths that were reported at lower voltages, the contact was maintained for sufficiently long periods. This also explains the paradox of surviving in high voltage electrocution when muscle spasms result and

the victim is thrown back clear of the conductor reducing, thus, the duration of contact [11, 12, 13].

It was easily to confirm the diagnosis of death by electric shock in all cases due to the multiple electric marks, associated in two cases with deep electric burns of the muscle tissue.

In half of the subjects, primary mechanical traumatic lesions were found, mostly linear excoriations, which probably occurred in the agony stage of death by friction against a rough surface during the convulsive phase of mechanical asphyxia.

The presence of toxic substances in the body was investigated, half of the subjects did not consume alcohol when the suicide was committed, but one was inebriated with a blood alcohol concentration of 2.10g‰. Alcohol consumption in suicide cases is said to be a trigger of the autolytic act. [14, 15, 16, 17, 18]

According to specialty literature, the suicidal electrocution is a common pattern among people suffering from mental illness with borderline personality and depressive disorder [19].

Among the cases studied, a 22-year-old man suffering from 'mixed personality disorder with alcoholic decompensation', and another victim had several suicide attempts by using other methods, such as: ingestion of toxic substances – pesticides, wrist cutting, and head injury caused by a nail.

As previously mentioned, the homicide by electric shock is extremely rare, there are several sporadic cases reported in the literature [20] and in our study, only one case of homicide was found. It was suggested that the quoted data of homicides by electric shock are, probably, underestimated due to the fact that it is difficult to establish the cause of death in certain circumstances, such as victim found dead in the bathroom with an electric device in the water. [21] This fact reinforces the importance to thoroughly investigate the scenes in all cases.

The case of a young woman found dead under uncertain circumstances can also be presented in this case study. A 16-year-old girl was found dead at home by her mother in the fall of 2008.

That day, the mother claimed to be at home with her family; at one point she heard the water running in the bathroom and because her daughter didn't answer her calls, she entered the bathroom and found her in the tub full of water, in ventral decubitus position, with a plugged-in 'hair dryer'. The forensic medical examination did not reveal external or internal traumatic lesions but at the water level, a pale border could be observed on the skin. A blood alcohol test was performed and the result was 0 g‰. The internal organs were assessed under a microscopy analysis and revealed congestion in all organs, interstitial brain lung and splenic bleeding as well as myocardial hepatic and renal dystrophic lesions. The following questions arose: Was her death violent or nonviolent? Was the death caused by the electric shock? If so, which is the legal classification: accident, suicide or even homicide? [22, 23]

The research carried out in both Romanian and foreign literature concluded with the observations of Beliș and Tsokos, two of the greatest forensic doctors: the electrocution can occur with no visible electric burns when body resistance is low and the contact area is large, which is the case of the electrocution occurring in a tub where a great part of the body is exposed to the conductor and the resistance is considerably reduced due to the presence of the water which also cools the skin leaving no visible skin-burning. They added that under these circumstances, linear markings of the skin at the water level may be visible but this is not specific to deaths caused by electric shock [3, 11].

Specialized studies have shown that the most common method of homicide is the electrocution by a plugged-in electric device introduced in the tub while the person is taking a bath because no visible electric burns occur and if the device is subsequently removed, the cause of death cannot be determined [24].

Therefore, medical arguments need to be thoroughly gathered for every forensic form which combined with judicial data will scientifically lead to accident, crime or suicide [25].

4. Conclusions

Suicide and homicide are currently an important social issue whether these are supported by emotional, intellectual, economic, religious or mental illness conditions. They occur in multiple ways and methods and our study illustrated the fact that non-accidental electrical death is another unusual cause of death even though the electricity is easily accessible and has a high success rate.

The forensic characteristics of electric shock deaths, as well as various individual biological factors, need to be closely discussed in order to help the criminal prosecution bodies to rule out accidental death. The study reported common circumstances of death with clear forensic form as no trace of fighting was observed at the scene of the incidents, the external examination of the bodies did not reveal other thanato-generating traumatic lesions except for the self-generated electric marks and the toxicological analysis ruled out the possibility of lethal intoxication.

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Incarcerated Mothers. A Psychosocial Perspective

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Abstract

Imprisoned women in Europe account for about 4.5% of the total incarcerated population.

According to the statistical data of the International Centre for Prison Studies (ICPS), in Romania 4.6% of the penitentiary population is made up of women. Deprived mothers are a high-risk group in terms of successful parenting, on the one hand because of the mental health problems they may face, on the other hand because of their own history of abuse and neglect, from childhood or adult life. The purpose of this paper is to present and analyse data obtained from our research on demographic data, attachment style and parental behaviour, parenting self-efficacy, strengths and difficulties of imamate mothers' children as reported by the mother, violence occurring in inmate mother's relationship with their partner and vice versa and stalking behaviours.

Keywords: incarcerated mothers, children with incarcerated parents, psycho-social aspect, attachment style, exposure to domestic violence, exposure to violence and neglect, mental health

1. Introduction

Delinquency is a mass social phenomenon that develops from individual behaviours, with the particularity of legal determination. Legal norms define the behaviours that fall among the crimes; also, the means and modalities that are applicable to them. [1]

Taken as a mass phenomenon, delinquency has multiple social causes, causing a wide variety of individual human behaviours, behaviours that have multiple effects on both the perpetrator and those around them, these effects being felt in the level of the whole society. Women incarcerated in Europe represent about 4.5% of the total incarcerated population. [2]

According to the statistical data of the International Centre for Prison Studies (ICPS), in Romania 4.6% of the penitentiary population is made up of women. [1] Mothers deprived of their liberty are a high-risk group in terms of parenting, on the one hand because of the mental health problems they face, on the other hand due to their own history of childhood abuse and neglected adults. [3]

The data presented and discussed in this paper resulted from the research and intervention activities effectuated during the "Raising a Child through Prison Bars" (JLS-2008-DAP3_AG-1260) international project. The project targets 5 particularly vulnerable groups of beneficiaries in 3 Balkan countries (Bulgaria-Greece-Romania): imprisoned mothers and pregnant women, infants living in prison and children whose parent is incarcerated.

2. Study Methodology

The purpose of this paper is to present and discuss the results of our research on demographics, attachment style and parental behaviour, parenting self-efficacy, strengths and difficulties of immature mothers' children as reported by the mother, violence occurring in inmate mother's relationship with their partner and vice versa and stalking behaviours.

The research population is made up of incarcerated mothers, the studied group being made up of 136 mothers deprived of liberty.

The research tools used included a questionnaire of needs assessment developed within the project (demographic data, educational level, marital status, and residence, working status, economic status of the family, self-assessment of relationships and problems, parental family, incarceration history, health and mental health history) and a set of standardized tools used to assess the dimensions listed above.

The tools included in this set were the following: Relationship Structure (RS) Questionnaire, TOPSE-Tool to measure Parenting Self-Efficacy, SDQ-Strengths & Difficulties Questionnaire, Revised Conflict Tactics Scale-CTS2, and Obsessive Relational Intrusion (ORI) Scale-Short Form combined with the Relational Pursuit for Stalking Perpetration [10], both used for measuring experiences, including victimization and perpetration. Thus, the scales used were:

1. The Relationship Structure (RS) Questionnaire [4] was used for measuring inmate's attachment style with "mother or maternal figure", "father or paternal figure", "dating or marital partner" and "best friend". The same 10 items are used per target and scoring varies within the limits of 0 (strongly disagree) and 6 (strongly agree). Scoring: two scores are produced for each interpersonal target; attachment-related avoidance score and attachment-related anxiety score.

The first four items of RSQ (counted for the calculation of the avoidance score) need reversion. The avoidance and anxiety scores are computed by averaging the scores on items 1 to 10 respectively. A general or global attachment style is also calculated estimated by averaging the scores computed across the four attachment figures and, consequently, two global means are produced; one for the global avoidance score and one for the global anxiety score.

2. The TOPSE-Tool to measure Parenting Self–Efficacy [5] was used for measuring parenting self-efficacy. The questionnaire is composed of 8 main sections, Emotion & Affection, Play & Enjoyment, Empathy & Understanding, Control, Discipline & Setting Boundaries, Pressures, Self-acceptance, Learning & Knowledge, each one consisting of 6 individual items. Scoring varies within the limits of 0 (completely disagree) and 10 (completely agree). Scoring: a total score for each section is produced by summing the valid items' scores within it. The number of each section is pre specified, and the sum of the certain section varies from 0 to 10 (0 to 60 similarly).

3. The SDQ-Strengths & Difficulties Questionnaire [6] (Parent version) was used for measuring children's mental health, applicable for children from 4-16 years old, but in order not to exclude minor children from 17-18 years old, the age range for the purpose of this study was extended to 18 years old. The questionnaire consists of 5 main scales: Emotional Symptoms, Conduct Problems, Hyperactivity, Peer Problems and Prosocial, each one consisting of 5 individual items. Scoring varies within the limits of 0 (not true) and 2 (certainly true). For each of the 5 scales, the total score can range from 0 to 10 (given that all items have been answered) and is prorated if at least 3 items are completed within it.

4. The Revised Conflict Tactics Scale-CTS2 [7] [8], was used for measuring Intimate Partner Violence (IPV) experiences, including victimization and perpetration. 39 items are asked twice: once about the respondent's partner's behaviour towards her (victimization items) and then about the inmate's behaviour toward her partner (perpetration items). The 78 items are composing 5 scales (Negotiation, Psychological Aggression, Physical Assault, Injury and Sexual Coercion), with two subscales of severity (cognitive – emotional for the Negotiation scale and minor – severe for the remaining scales) in each of them.

5. The Obsessive Relational Intrusion (ORI) Scale-Short Form [9] combined with

6. The Relational Pursuit for Stalking Perpetration [10], were both used for measuring stalking experiences, including victimization and perpetration. Both questionnaires contain 28 questions aiming to measure stalking behaviours, namely behaviours used by people for

pursuing intimate relationships with other persons without realizing that the other person does not want such a relationship.

3. Results

3.1 Descriptive statistics

The results obtained following the application of the needs assessment questionnaire [1] show that out of 136 mothers deprived of liberty, 68.4% were of Romanian nationality and 31.6% declared another nationality (of which 27.9% Hungarian and 67.4% Roma).

Their age ranged from 19 to 58 years (the average age was 34.07 years). Regarding the level of schooling, a percentage of 23.5% did not graduate any class, 1.5% are graduates of a faculty, and most of them have a baccalaureate (49.3%). The rest graduated only eight classes (15.4%) or attended a technical/vocational school (2.9%).

77.6% said they were married before incarceration, 17.9% lived in cohabitation, and the rest were separated from their life partner (0.7%), divorced (1.5%), their partner had died (1.53%) and a person stated that she was a single mother (0.7%). Only 13.7% of these women said that their marital status changed during detention.

Regarding the environment of origin, only 12.7% come from rural areas, the rest coming from urban areas (87.3%). 32.1% said they had a job before incarceration, 69.4% had never worked, 2.2% were unemployed and 0.7% retired.

Regarding their economic situation, 64.5% said that it was very precarious, at 0.8% it was very good, and 34.7% said it was moderate.

According to the literature, most women deprived of their liberty are convicted of nonviolent crimes, possession or drug-related offenses [11] [3], with drug offenses being reported as the most widespread source of conviction for women offenders in the United States [12] [13] and also around the world [14]. In the case of our sample, only 1.08% of mothers deprived of their liberty were convicted of drug-related offenses, 29.5% committed economic crimes, 18.9% life crimes, and 50.8% committed other crimes. Only 3.9% of the crimes for which they were imprisoned are related to children.

16.4% of mothers deprived of their liberty were recidivists. In the case of 17.9% there were convicted persons from the parental family, and 16.14% declared that someone from their close entourage was deprived of liberty.

International statistics show that a high percentage of incarcerated women have drug-related problems, with other research showing that rates of problem drug use are higher among women incarcerated than men deprived of their liberty [11].

It is also interesting that women in prison are more likely to inject drugs than men deprived of their liberty in the European Union [15]. It is also estimated that at least 75% of women at the time of arrest had problems with drugs or alcohol [15]. In the case of the researched population, only 5.2% stated that they had problems with drugs. In addition to drug and alcohol abuse problems, the same analysis reports very high rates of mental health problems in women incarcerated, such as post-traumatic stress disorder, depression, anxiety, phobias, neurosis, self-mutilation, and (attempted suicide) suicide [16] [17].

Another study on the population of women incarcerated in England and Wales [18] shows that 90% of these women have a diagnosed mental disorder, use substances (hallucinogens, drugs) or both, while it is estimated that 9 out of 10 women incarcerated has at least one of the following conditions: neurosis, psychosis, personality disorders, alcohol abuse or drug addiction. In this regard, 40.40% of the research population said they suffer from a chronic illness or disability. 30.7% said that they or a member of their family had to visit a mental health centre to alleviate the problems they were facing, and 98.81% underwent medication to alleviate mental problems.

The following text presents the results obtained from the application of standardized tools [19].

3.2 The attachment style of inmate mothers

The Relationship Structure (RS) scale is the instrument designed to assess the attachment style for 4 interpersonal targets (attachment figures): mother/mother-like figure, father/father-like figure, dating or marital partner and best friend.

According to the results obtained, the range of values (mean scores) within the figure types of mother, father, partner and best friend equals to 6 for the anxiety dimension.

In the avoidance dimension the range varies from 4.6-6 according to the target. For the maternal figure the difference between the mean scores of avoidance and anxiety seems significant and equals to almost 1 unit, with the avoidance score being greater than the anxiety.

For the remaining attachment figures, this difference equals to 0.76 (paternal), 0.44 (partner), 0.04 (best friend) and 0.55 (global style) units and the mean avoidance score is always greater than the mean anxiety one.

Both parametric (T-Test) and non-parametric (Wilcoxon) paired samples statistical tests for the significance of difference between the mean scores of avoidance and anxiety agree; results obtained show that in all cases, apart from best friend (p=.854, p=.311) the difference is statistically significant and the mean avoidance scores outclass these of the anxiety.

In Table 1 each inmate mother is classified to one of the four attachment styles according to the combination of her mean anxiety and avoidance scores for each attachment figure.

More precisely, if both mean anxiety and avoidance scores are less than 3, then inmate mother's style is secure, if mean anxiety score is equal to or higher than 3, but mean avoidance score is less than 3, then inmate mother's style is preoccupied, if mean anxiety score is less than 3 and mean avoidance score is equal to or higher than 3, then inmate mother's style is dismissing and, finally, if both mean anxiety and avoidance scores are equal to or higher than 3, then inmate mother's style is fearful.

As one can see, the higher score for fearful attachment style is related to the partner figure as the dismissing one point out the father figure with the higher frequency.

Table 3.1 Attachment style

Attachment figure	**Attachment style**				**Total N (%)**
	Secure	Preoccupied	Dismissing	Fearful	
	N (%)	N (%)	N (%)	N (%)	
Mother (like) figure	125 (94.7%)	2 (1.5%)	3 (2.3%)	2 (1.5%)	132 (100%)
Father (like) figure	95 (73.1)	3 (2.3%)	31 (23.8%)	1 (0.8%)	130 (100%)
Partner figure	91 (67.9%)	17 (12.7%)	4 (3%)	22 (16.4%)	134 (100%)
Best friend figure	93 (69.9%)	35 (26.3%)	4 (3%)	1 (0.8%)	133 (100%)
Global	125 (92.6%)	4 (3%)	4 (3%)	2 (1.5%)	135 (100%)

(Source: *Survey with Imprisoned Mothers and Children of Imprisoned Mothers/Parents.* Internal Report)

3.3 Parenting self-efficacy

8 sections were evaluated: Emotion and affection, Play and enjoyment, Empathy and understanding, Control, Discipline and setting boundaries, Pressures, Self-acceptance, Learning and knowledge.

TOPSE questionnaire shows that the mean score of Empathy and understanding scale is the maximum among all and equals to almost 9.55 units, while mean score of Pressures scale is the minimum and equals to 5.1 units.

In general, mean scores of inmate mothers are higher when referring to boys than to girls: statistical tests that follow indicate significant differentiation of mean scores between girls and boys on Learning and Knowledge scale only (p=.034); mean values for boys are higher than those of girls on average.

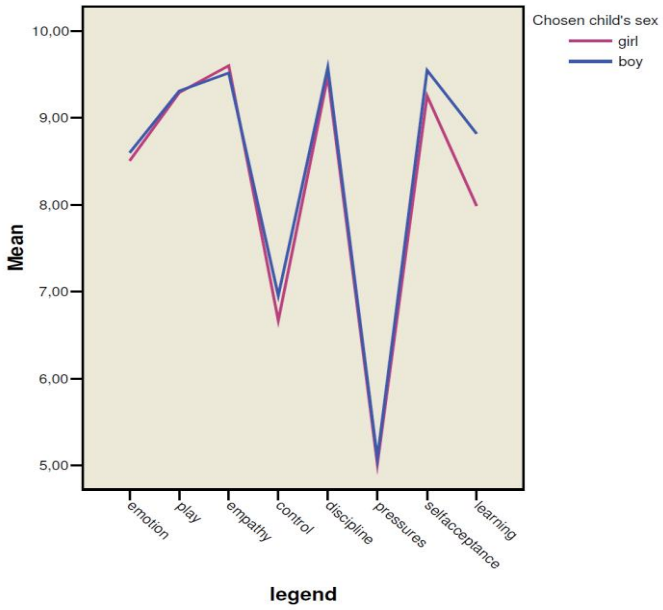

Fig. 3.1 Mean values and children's sex
(Source: *Survey with Imprisoned Mothers and Children of Imprisoned Mothers/Parents.* Internal Report)

3.4 Strengths and difficulties of inmate mothers' children as reported by the mother

According to the results obtained from the application of the questionnaire SDQ-Strengths & Difficulties Questionnaire: Emotional Symptom WHO: 24.38% of the children had the minimum score (0), while the percentage of children with scores 7 or 8 is only 1.4%. When talking about Conduct Problems: 8.8% of the children had the minimum score (0), while 2.9% had the score 6. Scores 7-10 do not appear at all in the distribution. Hyperactivity: 22.8% of the children had the minimum score (0), while the remaining children are distributed among the scores 1-4.

Peer Problems: 11% of the children had the minimum score (0) and only 0.7% had the score 6. Scores 7-10 do not appear at all in the distribution. Total difficulties: The distribution ranges from 1-19, with the vast majority of the children to concentrate in scores 3-8. Prosocial: scores 1-4 do not appear in the distribution, while the 90% of children is concentrated in scores 8-10.

Interestingly, boys have higher percentages than girls in the higher scores (9-10) and vice versa.

Inmate mothers seem to differentiate in the way they score for children of different sex.

However, statistical tests do not agree on the significance of this hypothesis; Paired T-test rejects it, whilst the nonparametric Kolmogorov-Smirnov Z cannot. Possible values of the total impact score data are 2 (0and 1), since none inmate mother scores higher than these values on the items accounted for total impact score estimation.

What is more the sample size of the two groups (boys/girls) differ and girls are less represented (N (girls) <30). It is straightforward that data assumptions of the parametric test do not hold and as a consequence, Z test is more reliable. The similarity of the total impact score between the boys' and girls' distributions is not rejected.

Table 3.2 Statistical tests among mean differences

	Mean Difference	Parametric				Non-Parametric	
		Levene's Test for Equality of Variances among girls and boys		(a=5%)		(a=5%)	
		F (df1, df2)	p	t(df)	p	z	p
Total Impact Score	-.20824	24.845 (1,63)	.000	-2.479 (59.657)	.016	.764	.087

(Source: *Survey with Imprisoned Mothers and Children of Imprisoned Mothers/Parents.* Internal Report)

3.5 The violence occurring in inmate mother's relationship with their partner and vice versa

Perpetration and Victimization results shows that Negotiation: cognitive subscale's items appear at a rate that ranges from 48% to 97% for the inmate mothers and from 0% to almost 74% for their partner, while emotional ones occur in the 25-91%of inmate mothers and in the 26%-98% of partners.

In case of Psychological Aggression: 0%-44% of Inmate mothers report behaviours of minor psychological violence as victimization methodologies, while 0%-59% (more than half) consider to be severe psychological abused. 16%-58% of Inmate mothers declare conducting minor psychological abuse to their partner and 0%-20% confirm severe acts. Victimization items are mostly accumulated on "more than 20 times" category for 2 items and for the rest the majority of frequencies does not exceed the1 time only during the past year with the partner.

This is also the case for the perpetration behaviours; in one case only (Threatening to hit or throw something at the partner/inmate mother) the highest percentage indicates repetition of 6-10 times within the last 12 months living with the partner. In general, 4 out of 8 perpetration rates are smaller, 3 are higher and 1 equal to the victimization one.

Physical Assault: minor physical victimization varies from 0.7%-43.4%, while severe does not exceed 30.5% of inmate mothers. Similarly, minor physical perpetration is apparent in 7.4%-15.3%and severe in up to 18.4%. According to the comparison of percentages' pairs, it is straightforward that in 3 minor physical abuse behaviours inmate mothers are mostly accounted for as victimized mothers rather than perpetrators, though in the rest 2 the inverse holds.

Referring to severe physical endorsement, 4 cases show intense victimization, 1 intense perpetration and 2 equality between these two types of rates. As for as these last 2 behaviours are concerned, "Using a knife or gun on my partner/inmate mother" (minor) and "Burning or scalding my partner/inmate mother on purpose" (severe), none inmate mother denotes them as methods applied to their partner or to them. Repetition of individual victimization techniques during the last 12 months together with the partner is mostly detected on either "1 time" or "more than 20 times" categories, apart from1 case where "3-5 times" category concentrates the majority of frequencies. Perpetration is rarely reported (no more than once).

Injury: the two minor abuse-distinct categories do not appear for the majority of perpetrator inmate mothers and victimized Inmate mothers (occurrence up to 7.4% and 35% respectively).

Likewise, up to 8.8% of perpetrator Inmate mothers and 19% of victimized ones mention severe injury. Individual victimization percentages are greatest (especially the first 4 rates) than the equivalent perpetration percentages, except for the previous to last, which is zero. The majority of individual incidences is detected on "Once in the year" category in both types of endorsement.

Sexual coercion: all but 2 sexual abuse items are absent in the majority of interviewed sample. In particular, minor sexual perpetration ranges from 0%-51% and minor sexual victimization from 0%-29% of Inmate mothers. Similarly, 0.7%-49% of Inmate mothers declare severe sexual coercion conducted by their partners and 0%-1.5% of Inmate mother's sexual coercion enforced to partners by the Inmate mothers. Indeed, all behaviours had zero frequency from either the perpetration or the victimization experiences scale (the former occurs more often).

Percentages of agreement: emotional negotiation agreement percentages are higher than those of cognitive scale. For physical assault, injury and sexual coercion, the lower minor percentage is smaller than the respective percentage of severe category. On the contrary, for psychological aggression the inverse holds. For all scales, apart from sexual coercion, the upper minor percentage is always smaller than the respective of severe behaviours.

For negotiation and sexual coercion mean values of inmate mothers (inmate mothers – perpetrators) are greater (the latter only slightly) than the mean values of their partner (inmate mothers – victimized mothers). For all other scales, injury, psychological aggression and physical assault, the inverse occurs, i.e., mean values of inmate mothers (inmate mothers – perpetrators) are smaller than the mean values of their partner (inmate mothers – victimized mothers), especially in the case of physical assault, where mean difference of perpetrators – victimized mothers equals to 19.99 units.

Emotional negotiation behaviours mean score is higher than the cognitive ones in both inmate mothers and their partner. This is also the case of minor psychological aggression, physical assault and injury scales. In sexual coercion the above applies only to perpetration sub category, since in victimization the inverse emerges (mean (severe) > mean (minor)).

Slightly more than 99% of inmate mothers mention that they had conducted at least one of the behaviours from the cognitive or emotional negotiation scales and almost 99% mention that their partner had conducted at least one of the behaviours from the cognitive or emotional negotiation scale.

Statistical tests provide evidence of statistically significant differentiation among the mean values of perpetrators and victims. Correlations between the suitable pairs are all statistically significant and positive, but none of them indicates strong linear correlation (all <0.7).

Table 3.3 Statistical tests on the mean values of perpetrators and victims

		Parametric (a=5%)			Non-Parametric (a=5%)	
Severity	Mean	T	Df	p	z	p
Psychological Aggression: perpetrator-victim	-.463	-6.939	135	.000	-5.966	.000
Physical Assault: perpetrator – victim	-.125	-2.171	135	.032	-2.139	.040
Injury: perpetrator – victim	-.441	-6.053	135	.000	-5.204	.000
Sexual Coercion: perpetrator – victim	-566	-5.574	135	.000	-5.353	.000

(Source: *Survey with Imprisoned Mothers and Children of Imprisoned Mothers/Parents.* Internal Report)

3.6 Stalking behaviours

The scales Obsessive Relational Intrusion (ORI) and Relational Pursuit were used to evaluate behaviours used by people for pursuing intimate relationships with other persons without realizing that the other person does not want such a relationship. The following data were obtained:

Victimized inmate mothers: exposure of inmate mothers to stalking is more limited than the non-exposure. Percentages of positive answers vary from 0% to 71.3% and individual frequencies are more concentrated in the lowest category, that of "only 1 time".

Perpetrated by inmate mothers: the negative answers for the use of stalking behaviours have even higher frequencies than these in the victimization items; hence, the range of the positive answers percentages is 0-57.4%. Individual frequencies are also more concentrated in the lowest category that of "only 1 time". The positive answers are assigned to the ordered frequency categories and show that these decrease as the frequency level increases; namely, the 1st level contains the majority of responses, the 2nd level (2-3 times) less than the previous one, the 3rd level (4-5 times) much less and the 4th level (over 5 times) does not include any positive replies at all.

According to the results, inmate mothers score rather higher on victimization scale items than on perpetration ones. Indeed, inmate mothers tend to endorse fewer stalking tactics when presented as perpetrators. This is not the case however, when they are perceived as victims; quite on the contrary, IMs reveal either multiple or repeated stalking exposure leading to total score increase.

Data from table 4 show the difference among total scores of victims and perpetrators is significant.

Table 3.4 The mean values of perpetrators and victims

		Parametric (a=5%)			Non-Parametric (a=5%)	
	Mean	t	df	p	z	p
victim-perpetrator	7.33824	12.386	135	.000	-9.018	.000

(Source: *Survey with Imprisoned Mothers and Children of Imprisoned Mothers/Parents.* Internal Report)

4. Conclusions

The results of our research confirm the psycho-social vulnerability of the research group.

This vulnerability often occurs from the childhood of these mothers, a period characterized by instability in family life, sprinkled with various forms of domestic violence and/or bullying by the peer group. Early interruption of the educational process, involvement in temporary cohabitation or early marriages, psychological vulnerability, brought them far too quickly among female crime.

Deprived mothers are a high-risk group in terms of parenting, on the one hand because of the mental health problems they face, on the other hand because of their own history of childhood abuse and neglect or their life. adult [1] [3].

After these mother's face feelings of shame and/or guilt because they committed the crimes that separated them from their children [20]. As a result of deprivation of liberty, mothers often experience "frustration, conflict, and guilt because they are separated even though they cannot care for their children." Although 70% of the mothers in our research sample said that their children do not suffer because of their incarceration, on the occasion of participating in the support groups they said exactly the opposite of the initial statement. Despair and depression are described as prevalent in incarcerated mothers, even by those who characterized themselves as inappropriate parents when living with their children [22].

The way mothers deal with their emotional problems regarding deprivation of liberty affects the way their children adapt to the new conditions [23].

Thus, it is considered important to emphasize that deprivation of liberty does not mean that a parent, especially a mother, cannot continue affectionate relationships with her children. On the contrary, it is essential that these relationships be sustained or reconstituted when the mother is released or when it is in the best interests of the children [24].

Qualitative findings show that mothers deprived of their liberty unanimously report their desire to do what is right for their children. [25] [26] [27] [28] From this perspective, planned efforts to strengthen their maternal role as well as relationships with their children are helpful. Numerous studies Delcea C, Enache A, Stanciu C, [30], Delcea C, Enache A, Siserman C. [31], Gherman C, Enache A, Delcea C. [31], Delcea, C., Fabian, A. M., Radu, C. C, Dumbravă D. P. [33], Rus, M., Delcea, C., Siserman C., [34], Siserman, C., Delcea, C., Matei, H. V., Vică M. L. [35], Gherman, C., Enache, A., Delcea, C., Siserman C., [36]. confirm our results.

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Diagnosing ADHD Syndrome in Adults: Identifying Symptoms and Assessing Treatment Options

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Abstract

This article represents an overview of the main assessment criteria for adults manifesting attention deficit and hyperactivity syndrome (ADHD), the medication utilised, as well as a series of aspects related to attention function, and planning capacity, learning capacity, inhibition and responses, abstract thinking, emotional adaptation and social traits found in such individuals.

Keywords: ADHD, assessment criteria, treatment, psychological aspects

1. Introduction

Although, in principle, it is believed that it affects children, it is estimated that 10 million adults in America suffer from this syndrome [1]. Since symptoms and treatment for children with ADHD are slightly different from those in adults, and research related to adults is still in its incipient stage, most adults do not know whether they suffer from this disorder or not. There is no single test which can identify the syndrome and lead to establishing a diagnosis. The latter will be based on a comprehensive evaluation which must include: examining antecedents and a physical exam, in order to exclude any other potential source of symptomatology, a psychological examination, as well as an interview with the adult's life partner or a close friend.

ADHD symptoms differ from person to person, but, according to DSM 5 criteria, they include inattention and hyperactivity – impulsiveness. Some symptoms of hyperactivity-impulsiveness or inattention must have been present before the age of 12, with difficulties stemming from these symptoms being present in two or more circumstances (at school, in the workplace, at home, with friends or relatives, in other activities) and there must be clear evidence that these symptoms interfere with or reduce the quality of social, academic or occupational functioning. The last criterion mentions the fact that symptoms do not occur against the background of schizophrenia or other psychotic disorders and cannot be explained by another mental disorder, such as mood disorders, anxiety, dissociative disorder, personality disorder, substance abuse etc. [2]

The diagnosing process for this syndrome in adults is much more complex, due to the variety of conditions which can produce similar symptomatology, such as alcohol or drug addiction or depression. Although recognising symptoms can be difficult in the case of adults, once diagnosed, they have several treatment options. Stimulants such as Ritalin may cause unwanted side effects. Several studies claim that medication should only be part of the treatment. A multimodal approach seems to be the best way to alleviate symptoms.

Among specific ADHD symptoms in adults, one can mention: chronic lateness and forgetfulness; anxiety, depression; low tolerance to frustration; boredom; lack of organisational skills; low self-esteem; difficulties in controlling anger; impulsiveness; and addiction [2]. These

symptoms can be manifested with various intensities, they can vary depending on the situation or they can occur at the same time. Ignoring these difficulties can lead to disturbances in the emotional, social and academic fields.

Specialists claim that adults manifesting this syndrome develop severe forms of depression, which only respond well to pharmaceutical treatment. As a result of anxiety and depression occurring against the background of personal and professional failures, these individuals become more easily addicted to various substances. Researchers in the University of California in the USA have observed that 40% of adults with this disorder are smokers, while the proportion in the general population is 26%. Other researchers have noted that ADHD is associated 5 to 10 times more frequently with alcohol consumption, compared to the general population.

A series of studies have examined the functioning level of children with ADHD, but very few have tracked these children in their development as adolescents and adults. Such a study was carried out in 1998 by a group of researchers on two samples of subjects, the first consisting of 85 teenage boys diagnosed with ADHD in their childhood, and the control sample consisting of 73 teenage boys. The goal of the study was to assess the differences between the two groups with regard to antisocial personality disorder, substance abuse, mood disorders and anxiety.

The results showed a higher rate of antisocial disorder in the first sample (12% compared to 4% in the control group), as well as of substance abuse (in the same proportions). On the other hand, no significant differences were found with regard to anxiety and mood disorders [2].

Being a disorder which debuts in childhood, most adults with ADHD have adapted to their condition, and if the disorder is treated accordingly and the patient is compliant with the treatment, his or her quality of life can improve significantly, personal and professional activities being carried out as well as any other active member of the community. Many people attribute their manifestations to their struggle with stress and to the rapid pace of life, but they may be undiagnosed symptoms of ADHD. In this context, answering the following questions can help [3]: Are you easily distracted? Do you have difficulties concentrating? Do you tend to be disorganised? During a conversation, do you focus on the message coming from your conversation partner? Do you usually forget things (e.g., a meeting or certain obligations)? Do you have difficulty following a process which has many steps? Do you have difficulty initiating or completing a project? Do you tend to postpone certain activities? Do you have difficulty establishing priorities? Do you quickly become impatient? Do you often feel agitated or restless? Do you have difficulties related to time management? Do you have difficulty finding objects at home or at work? Do you act before thinking of the consequences? Do you speak before thinking of the impact your words have on others? Do you tend to have a lot of thoughts? Are you easily bored? Do you make mistakes when you work on a boring or difficult project? Do you frequently take risks?

If the answer to most of the questions is “yes”, and the behaviours manifested are quite severe, interfering with the individual’s daily activities, then it is possible that the subject has the syndrome. A precise diagnosis can be established only by a professional, who is able to exclude a series of other syndromes with similar manifestations (depression, bipolar disorder, toxicomania, anxiety, phobias).

Using valid diagnostic criteria, a series of studies showed that the childhood symptoms of attention deficit persist into adulthood in approximately 50% of cases. However, specific manifestations can change throughout one’s life and it is possible that the adult syndrome be under-diagnosed. It would seem that, although boys suffer from this syndrome more frequently than girls, this gender difference does not continue into adulthood, both sexes being equally affected.

The clinical assessment of the ADHD syndrome in adults must take into account the following aspects: Evaluating symptoms present in childhood; Evaluating aspects referring to

behavioural issues, low attention focus ability, low academic performance which is non-concordant with intellectual potential; Neurological evaluation and Psychological evaluation.

Due to the fact that attention deficit and hyperactivity disorder debuts in childhood, its assessment in adults can be carried out in the following stages [4]: determining the patient's psychiatric status and establishing a retroactive diagnosis. If the patient's memory is not accurate, the most useful approach is for the patient's parents to supply information regarding childhood manifestations.

A parental assessment scale can be used to this end. Complementary, a self-assessment scale can be used for hyperactive manifestations in childhood. The second one is assessing specific ADHD symptoms present in adulthood, using for instance the Wender Utah rating scale.

Diagnostic criteria eliminate patients with severe mood disorders, schizophrenia, antisocial personality disorder or borderline personality disorder. With regard to the persistence of the syndrome into adulthood, Weiss and Hechtman carried out a longitudinal study in which they monitored the evolution of patients diagnosed with ADHD in childhood, for a period of 19 years. In adulthood, 60% of them manifested the syndrome.

In a similar study, Mannuzza *et al*., [2] tracked the evolution of patients diagnosed with ADHD, and in adulthood, 40% of them manifested the symptomatology, 18% manifested antisocial personality disorder and 16% presented substance abuse.

Utah criteria for the assessment of the ADHD syndrome in adults includes the following symptoms: childhood history consistent with ADHD; specific symptomatology; hyperactivity and deficient concentration; emotional lability; impulsiveness; inability to complete tasks and lack of organisation and low tolerance to frustration [5]. Utah criteria also include emotional aspects. Impulsive episodes, characterised by 'temperamental eruptions', are very quickly forgotten by the individual, but more difficult to forget by workmates or family members.

Emotional lability is characterised by short intense bursts, which vary from euphoria to anger and desperation. Other adult manifestations of ADHD include problems in the following 5 dimensions: activity and organisation (difficulties in organising one's daily tasks); sustained attention (includes aspects such as: distraction, daydreaming); durable energy and effort (drowsiness, low rate of task completion); managing affective interference (low motivation, irritability, low tolerance to frustration); and working memory and the ability to recall information (low performance).

P. Wender [4] carried out a wide study with a sample of 300 ADHD patients, using psycho stimulants in the experimental group: methylphenidate (Ritalin), pemoline (Cyclert), l-deprenyl (selegiline), bupropion (wellbutrin), levodopa, dl-phenylalanine and l-tyrosine, and a placebo treatment for the control group. The author observed that approximately 60% of the patients who had been administered stimulants manifested significant progress, compared to only 10% in the control group, which had received the placebo treatment. The results of the two groups were assessed using Global Assessment of Functioning (DSM-IV). Of all the substances administered, major effects were noted following the use of methylphenidate, pemoline and MAO inhibitors.

A complete treatment for adults with ADHD involves informing the patients about their disorder, as well as presenting the therapeutic matrix, in which the patient receives explanations on the advantages and disadvantages of receiving the medication. Among the changes patients can experience as a result of medication,

Wender lists: reducing the degree of motor agitation; patients become able to relax, to sit for longer at a desk or while watching a movie; concentration capacity improves significantly; the patients' attention to marital conversation increases, consequently, the rate of marital conflict decreases; moments of 'boredom' are reduced and the patients report a stable mental state; patients become less irritable, bursts of anger decrease in frequency and intensity, to the point of total disappearance; organisational ability increases (at school, at work and at home); patients

become able to face life problems, becoming more robust when dealing with difficult situations; the ability to listen to the conversations of other people improves; patients become more tolerant in traffic, obtaining increased impulse control in social situations.

The treatment of adults with ADHD often includes stimulant substances. Their side effects include an increase in blood pressure and pulse, which may lead to strokes and heart attacks.

Before initiating any treatment, adults with ADHD should undergo a complete medical examination [6].

Kane *et al*., (1990) reported that the cognitive manifestations of an adult with attention deficit include difficulties in directing and sustaining attention, difficulties in completing projects; becoming overwhelmed by daily issues; difficulties in maintaining an organised living and work space; inconsistent performance and deficient attention to details.

The same authors indicate that hyperactivity manifestations in adults and impulsive behaviour include decision making without anticipating consequences, risk or thrill seeking, commenting without thinking of the impact on the interlocutor, low tolerance to frustration, multiple violation of traffic rules Although most individuals with attention deficit seem to be normally adapted to adult life, the incidence of antisocial behaviour, substance abuse and academic failure can be found in a higher frequency than in the general population [7].

2. Traits Associated with ADHD

2.1 Attention and concentration

A wrong conception, often encountered in the study of attention deficit and hyperactivity, is that attention deficit occurs in a consistent manner in all fields of an individual's life. In reality, the true problem is the inconsistence of attention. Rather than an inability to pay attention, individuals with attention deficit manifest a 'defective distribution' of attention. People with the syndrome find it difficult to distinguish relevant from irrelevant details, or to identify important stimulation they experience.

Distraction is an essential attention issue experienced by individuals with attention deficit.

Some subjects in this category seem to be distracted by objects in the environment; others seem to be surprised by the outside world, while others become preoccupied by internal events (dreams, thoughts, and ideas). Symptoms in this category are often dismissed, since they are apparently less bothersome than impulsiveness and hyperactivity symptoms [6].

Inattention may disappear when the individual is preoccupied by something which is highly interesting. In a professional field, this is a colossal advantage, even if concentrating attention strictly onto one field may cause inattention in other fields. Relevant cases are exemplified in the literature, such as the case of a geologist who, on his way to a meeting, carefully observed the composition of each rock formation alongside the road, only an hour later realising that he had been driving in the wrong direction. Since the strategies used by this category of people are compensatory, they however require the expenditure of a large amount of energy, accompanied by rigidity and low tolerance to frustration. Individuals with attention deficit often cannot tolerate being interrupted and cannot change the order in which they perform tasks.

2.2 Organisation and planning

The impact of a low capacity to concentrate in the case of individuals with attention deficit also reflects upon planning and organisation tasks. Individuals with attention deficit also approach tasks in a disorganised and random manner, with a low degree of planning and a low sense of priorities. Such lack of organisation can consistently undermine even their best intentions and efforts.

An example is the student who spends many hours collecting articles with the purpose of writing a research paper, but then encounters difficulties organising them into a coherent paper.

Another example would be a person who has worked efficiently as part of a team in a multinational corporation, where her role was well defined, but did not perform when she had to work alone on a large project. Lack of organisation and planning can be observed in a cognitive evaluation, where many individuals make mistakes in open-ended questions, but give a higher performance in tests with limited parameters or when they receive precise indications and instructions. Individuals with attention deficit tend to be unusually dependent upon the structure of a task and have difficulty organising a complex, unstructured activity or project [7].

Attention deficit is also associated with difficulties in time management and establishing a timetable. Individuals with attention deficit have the tendency to create impossible timetables for themselves; they frequently take on several tasks at the same time, and then fail in prioritising, solving less important issues first and postponing urgent tasks. Consequently, they often exceed deadlines. Postponement is very frequent, probably resulting from the combination of task difficulty, deficient planning and a chronic tendency to underestimate the time required for completing a task.

2.3 The level of physical and mental activity

It was frequently noted that psycho-motor agitation and hyperactivity diminish in the middle stage of adolescence, which is why it was probably thought that the syndrome is overcome as one ages. However, many individuals continue to be bothered by the varied forms of their hyperactive behaviour. Some remain restless, while others tend to be very active in constructive activities. Many adults with attention deficit choose jobs, lifestyles and hobbies which fit their need for movement, change, stimulation and flexibility. This is one of the reasons why many individuals with attention deficit consider themselves to be 'late bloomers', reaching success in their mature years, after a troubled adolescence and youth.[4]

Both children and adults with attention deficit may experience excessive mental unrest, having difficulties in concentrating their attention. Still, in some individuals, excessive mental activity is not accompanied by motor hyperactivity, but can be limited to distracting thoughts, tangential associations, obsessive preoccupations, meditation and anxiety. This 'mild hyperactivity' can manifest as muscular tension; this, combined with mental unrest, can lead to insomnia and frequent dissatisfaction.[5]

Hyperactive adults, especially male, often crave strong stimulation and seek risky activities.

Typical examples include car races, flying, parachuting or skiing. Studies focused on hyperactive adults show that manifesting a behaviour which is detrimental to one's health, such as smoking or speeding, does not stem from a lack of information on the risks posed by these actions, but rather from the individuals' inability to apply such knowledge in a practical way.

Adults with intellectual inclinations can read several books at once. One such example is a mother of three who obtained her bachelor's degree in education, a PhD in psychology and another diploma of law. Some such individuals have the tendency to be unaware of their physical and emotional needs. They may ignore basic needs, such as hunger; others manifest unusual tolerance to pain or discomfort.

2.4 Inhibition and responses

Impulsiveness is another defining feature of attention deficit. It becomes evident in social and interpersonal situations and in decision making, as a lack of response inhibition. This type of behavioural control belongs to the neuro-cognitive field of executive functions, which are mediated by the brain's frontal networks – a theory promoted by Barkley ever since the '90s.

In unusual circumstances, in the case of these individuals, there is no time interval between the idea of acting and the action itself. Impulsive individuals tend to be impatient and have low tolerance to delays, frustration and stress. Impulsive responses may lead to car crashes, physical harm or fights with family members. Some individuals tend to repeat the same mistakes,

seemingly unable to learn anything from these experiences. [6] In decision making, impulsive adults often cannot put in the required effort to consider all factors involved, or cannot imagine the consequences of their actions. They risk making hasty decisions, even in the case of major life events.

2.5 Learning and memory

Learning and memory issues associated with attention deficit are special cases of deficient attention and focus, or inadequate organisation and integration issues, rather than a real mnesic problem. The results are inabilities in encoding or storing new information and the inability to partly or wholly retrieve the stored information. Individuals with attention deficit often use a passive encoding strategy; a part of the material is never learned, because it is only superficially processed. Attention deficit also occurs as a retrieval issue. Academic failure may result from an incomplete retrieval of information in tests.

2.6 Abstract thinking

Another cognitive manifestation of attention deficit is delay in developing certain forms of abstract thought. Although in some cases this can reflect inattention to details or incomplete data processing, Pennington (1991) brings proof supporting the existence of a subgroup with a primary frontal lobe deficit. The performance of this subgroup can be established by solving the tasks in the *Wisconsin Sort Card Test* or the subtests of *WAIS-R.* [8] These aspects do not imply a low IQ, although sometimes intelligence quotient scores do not reflect real ability. Individuals may have superior intelligence and even excel in solving problems, especially those with a high degree of structure and consistency.

2.7 Social and interpersonal skills

Adults and teenagers with attention deficit are frequently disadvantaged in social situations.

They often do not understand the conversation topic or cannot appreciate a joke. Not surprisingly, they often claim not to be 'in sync' with others and many prefer to withdraw rather than be perceived as socially 'weird'.

Those who are impulsive have difficulties in behavioural self-regulation; their comments may seem irrelevant or even intrusive. Individuals with a high distractibility rate manifest a phenomenon known as 'cocktail party' – they cannot concentrate on a discussion in a crowded room, being distracted by the other conversations going on. With regard to the social relationships of children who present ADHD symptoms with other children, one can mention the observations of W. Pelham and M. Bender from Pittsburgh University. The authors estimated that over 50% have major difficulties in relating with other children, are less able to cooperate and have fewer play mates. [9]

2.8 Emotional adaptation and mood stability

The cognitive and behavioural issues characteristic to attention deficit seem to improve only by maturing. Individuals with attention deficit learn by experience that, in order to survive, they must pay attention, impose certain priorities, make decisions, inhibit certain impulses and crystallise their plans. Since, from an early age they have used any emotional and cognitive resources in order to improve performance, individuals with attention deficit have used compensatory strategies, which serve to explain the manifestations of anxiety many exhibits.

Learned adaptations tend to remain costly in terms of effort and energetic consumption and often reside in states of stress.

A great part of researchers agrees that subjects with ADHD manifest symptoms of depression and anxiety, opposing and defying behaviour. Two thirds of them manifest stubbornness and aggression. They are easily enraged and can physically or verbally attack

children of the same age. [8] Many adults with ADHD manage their emotional sphere with difficulty, especially in situations in which they feel intense fury or frustration. Common emotional symptoms include: feelings of failure or lack of achievement; inability to control frustration; nervousness, irritability and rapid mood changes; hypersensitivity to criticism and low self-esteem.

3. Conclusions

The complexity of the attention deficit and hyperactivity syndrome implies a multi-modal approach, and therapeutic intervention must focus on the resources the individuals have at their disposal. Only a comprehensive approach of all mechanisms involved can lead to understanding the specific symptoms and to identifying the most appropriate intervention methods.

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Psychopathological Personality Traits and Decision Making in the Act of Murder

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Abstract

Schultz P. D. and Schultz E. S. [1] claim that the personality is a series of particular and significant patterns of cognition, emotion and behaviour which compose an individual's personal way of interacting with the environment and with other individuals. This article approaches psychopathological personality trans-theories related to the decision making involved in murder.

Keywords: personality, psychopathology, decision

1. Introduction

Psychoanalysts [2] claim that the human personality is determined by sexual biological instincts, aggression and experiences which occur in development in the first five years of life, while the structure of personality is composed of ID, ego and superego. Developmental stages are psychosexual, and decisions are mediated by instinctual pulse and by the ego platform as mediator between the id and the superego.

The psychoanalysts' approach regarding human personality and decision making was contested by the behaviourists [3], who emphasised that personality differences result from differences in learning experiences, and decisions are preceded by behavioural patterns, not sexual needs and impulses. By operant conditioning, decision makers learn to associate specific behaviours with rewards and punishments, so that decisions become a primer preceding a behaviour and vice versa. The cognitive paradigm of personality and decision making is based on the idea that personality differences stem from the different ways in which decision makers represent data on themselves, on others and on their personal world in order to make an adaptive decision.

The humanists [4] claim that personality and decision-making correlate depending on the needs and goals of the self, motivation being the central point of human decision making.

Evolutionist psychology attempts to reason human personality and decision making in terms of adaptability of certain characteristics for existence and successful reproduction throughout human history. Studies claim that decision making is mediated by personality traits and/or by adaptive or maladaptive cognitive schemas. For instance, Krasno J. and LaPides S. [5] set out from a study on decision making and personality in company leaders with narcissistic personality; they identified a series of correlations between psychopathological personality traits and decision making to the detriment or even against subordinates, no longer performing as managers in the organisation.

Sputtek R. [6] identified the personality trait of fury as mediator of individual decision making in relation to others, in the guise of perceived injustice, attack or unfair treatment from others, or of frustration resulting from the failure of a personal goal. Decision makers with a high level of fury as a personality trait experience recurrent and intense states of anger.

Stevens R. J. [7] adds another personality-decision making correlating study on impulsive individuals, identifying choleric and labile traits, lack of self-control and a high risk of decision making towards expressing violence and/or verbal aggression. Therefore, these decision makers have low tolerance to frustration and have no capacity to delay gratification. Below, an overview of several studies and research is presented, from the point of view of the cognitive/behavioural paradigm and of cognitive psychology, with regard to the psychopathology of personality traits, to conditioned or non-conditioned maladaptive cognitive schemas, as well as to maladaptive emotional schemas. The importance of these theoretical – experimental approaches is the object of the present paper, given their empirical robustness, since this research is current and more accurate in conceptualising and outlining the decision maker involved in murder.

2. Theoretical-experimental Approaches

The approach of psychopathological personality traits is done from two points of view: the categorical – nosologically approach [8], [9] and the paradigmatic dimensional approach [10].

The categorical – nosologically approach is a categorical index of personality disorders. In the two manuals (*Diagnostic and Statistical Manual of Mental Disorders-DSM* and the *Classification of Mental and Behavioural Disorders: Clinical Descriptions and Diagnostic Guidelines-ICD*), the ten personality disorders are structured: paranoid, schizoid, schizotypal, antisocial, borderline, histrionic, dependent, avoidant, obsessive-compulsive and narcissistic.

The table below presents psychopathological personality traits in clusters. Category A indexes bizarre and eccentric personality traits. Category B includes theatrical psychopathological traits like intense emotional expression, as well as lability, and Category C encompasses anxious psychopathological traits.

Table 2.1 The clusters of personality disorders, according to DSM-5

Cluster A – characterised by the bizarre and eccentricity	Cluster B – characterized by being theatrical, intense emotional expressiveness and instability	Cluster C – characterized by anxiety and worry
Paranoid disorder Schizoid disorder Schizotypal disorder	Antisocial disorder Borderline disorder Narcissistic disorder Histrionic disorder	Avoidant disorder Dependent disorder Obsessive-compulsive disorder

Sadock J. B. and Sadock A. V. [11] claimed, from the perspective of the category-nosologic approach, that the psychopathology of personality is a rigid, maladaptive personality pattern, which produces suffering and dysfunction. The five key characteristics of personality disorders are: rigid, extreme and distorted thinking patterns, problematic emotional response patterns, difficulties in impulse control and clinically significant interpersonal issues.

The same researchers claim that the fields of psychopathological personality traits are: *negative affect* (lability, anxiety/separation, docility, hostility, perseverance, depression, suspicion, affective limitations), *detachment* (withdrawal, avoidance, anhedonia, depression, affective limitation, suspicion), *antagonism* (manipulator, dishonest, grandeur, attention seeking, harshness, hostility), *disinhibition* (lack of responsibility, impulsiveness, distractibility, risky behaviour, rigid perfectionism); *psychoticism* (unusual beliefs and experiences, eccentricity, cognitive and perceptive affectation).

Table 2.2 Psychopathological personality traits

Existential purpose			Reproduction strategy		
	Developing life quality	Life conservation	Reproductive propagation	Reproductive care	
Deficiency Misbalance conflict	Pleasure – pain		Self/Other		
	Pleasure (reduced) Pain (reduced or great)	Pleasure – pain inversion	Self (low) Other (high)	Self (high) Other (low)	Self – other inversion
Adaptation modality	**Personality disorders**				
Passive: Accommodation	Schizoid	Masochist	Dependent	Narcissist	Compulsive
Active: Modification	Avoidant	Sadistic	Histrionic	Antisocial	Negativist
Structural pathology	Schizotypal	Borderline	Paranoid		

Source: adapted after Millon T., 2010 [12, 13]

Millon T. [12] proposes a dimensional indexing from the perspective of the psychodynamic paradigm, claiming that psychopathological personality traits can reunite several personality disorders or are limited to a few psychopathological traits. In table 2.2, Millon T. and Krueger F. R. [13] present the derivates of psychopathological personality traits in the evolutionist model, from the perspective of the dimensional approach. Depending on the relation to one's self and to others, individuals with social deviation can develop aggressive and antisocial behaviours, so that they can become criminals, rationalising their psychopathological behaviour. The researchers outline a profile in relation to the traits of a criminal, underlining that murderers are determined by labile expressivity, with an irresponsible interpersonal status, deviant thinking (own laws, social dogmas etc.), with a self-governed self-image, insensitive and non-disciplined, verbally and physically hurtful, without guilt or remorse.

Beck T. A., Davis D. D. and Freeman A. [14] bring to the table a robust theoretical – experimental approach in outlining psychopathological traits in criminals. They claim that decision makers accused of murder have an early history of behavioural disorder and an extremely irresponsible and socially threatening pattern of manifestation, incorporating criminal acts which threaten or harm others and their goods.

In table 2.3, one can identify the dimensional cognitive behavioural approach of psychopathological personality traits in criminals. The cognitive profile presented in table 2.3 describes the criminals' relation to themselves; they consider themselves alone, autonomous and strong, due to their distorted perception of society wishing them harm, or of being victims of society. Others simply see themselves as predators in a 'dog eat dog world', where violating values/norms is normal and even desirable. Decision makers involved in murder see their relation to others as based on exploitation, with some individuals being seen as powerless, vulnerable and deserving of their status as prey. Cognitive schemas are the decision maker's convictions, which mediate an antisocial behaviour. The psychopathological working strategies/coping mechanism of a decision maker with a criminal past involve attacking, robbing, openly stripping others, cheating, manipulating. A criminal's principal emotions are anger and a feeling of grandeur and power. [15].

Table 2.3 Psychopathological personality traits in criminals

SELF	OTHERS	COGNITIVE SCHEMAS	COPING
Lonely	Vulnerable	"I have the right to break the rules"	Attack
Autonomous	Exploratory	"the others are suckers and weak"	Steal, manipulate
Strong		"I am better than the others"	Cheat

Source: adapted after Beck T. A., & Davis D. D., 2015 [14]

On the other side, Michael H. Stone [16] outlined the psychopathological personality traits of criminals in the form of clinical intensity, from type 1, individuals who had committed occasional offences, being predisposed to criminality, up to type 12, individuals involved in serious and recurrent offences, such as murder. Table 2.4 presents Stone's antisocial scale, where one can see the behavioural dimensions of a potential criminal divided into several levels on a criminality scale/axis.

Table 2.4 Stone's antisocial scale

Type 1 – alcoholism, drugs, prostitution etc.	Type 2 – bully, drunk in public, inappropriate behaviour	Type 3 – fraud, fiscal evasions, dilapidation, theft from state/private institutions
Type 4 – breakings, car/pocket theft etc	Type 5 – arson, explosives	Type 6 – manipulation, deception etc.
Type 7 – harassing/nonviolent threatening etc.	Type 8 – not-intentioned crimes under the influence of substances	Type 9 kidnapping of people, without killing
Type 10 – uncontrolled fury reactions	Type 11 – criminal groups, rape, paedophilia, sexual abuse	Type 12 – crime, armed attacks, physical attacks, domestic violence

Sources: adapted after Stone, M. H., 2000 [16]

Babiak P. and Hare D. R. [17] identify a profile related to psychopathological personality traits, underlining the 20 psychopathological traits, such as glibness/superficial charm, grandiose feeling of one's own value, need for stimulation/inclination towards boredom, recurrent lying, manipulation, lack of guilt, superficial or absent emotions, lack of empathy, parasitic lifestyle, low behavioural control, promiscuous sexual behaviour, early behavioural problems, lack of realistic long term goals, impulsiveness, irresponsibility, criminal versatility etc. In table 2.5, Babiak P. And Hare present victim relation styles from the point of view of psychopathological personality patterns, emphasising the three stages in which a criminal approach the adversary in order to study their vulnerabilities, after which the criminal decision maker persuades the victim in order to be used, murdered and/or abandoned.

Consequently, in table 2.5, the authors underline the three stages of psychopathological relationships initiated by murderers. In the first stage, the decision maker studies the victim's vulnerabilities, in order to persuade him/her to give in to the decision maker's criminal challenges and interests, after which the victim is murdered or abandoned.

Table 2.5 The three stages of psychopathological relationships initiated by murderers

I. The victim evaluation phase	The psychopath's approach in relation with the other
II. The manipulation phase	
III. The abandonment phase	

Source: adapted after Babiak & Hare, 2007 [17]

As a result of studies performed on hundreds of murderers and other offenders, Kiehl A. K. [18] claims that decision makers with antisocial psychopathological personality traits are no different from non-criminals in terms of their apparent attitudes and behaviours, since they have

learnt from experience when contingency is immediate, clear and well specified, tangible and relevant for their self. In controlled studies of subjects being evaluated with a polygraph test, reduced electro-dermal reactions were confirmed, with antisocial psychopathological traits, due to the cognitive mediator and the maladaptive cognitive schemas.

3. Conclusions

Emerson D., Gacono B. C. [19] and Cleckley H. [20] refer to the criminal decision maker's psychopathological personality traits, underlining the psychopaths' antisocial patterns, distinguishing primary from secondary psychopathy.

On the one hand, primary psychopathy shows a lack of empathy/guilt caused by an immoral/illegal behaviour, due to acquired abilities and lifestyle of pathological lying, hurting others and not having moral values, rationalising antisocial behaviour without being aware of harming others. On the other hand, secondary psychopathy refers to an impulsive immoral/illegal manifestation, but with a marked feeling of guilt/anxiety, due to fear of consequences, with the individuals persisting however in their behaviour, rationalising antisocial behaviour and guilt through the victim's provocative attitude. However, the major significance being given to criminality is a controversial academic debate, due to vast and inconsistent terminology and conceptualisation, and due to the lack of controlled studies, which cannot empirically sustain all theoretical approaches [21], [22], [23].

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Individual Differences in Subjects with Psychiatric Comorbidities and Personality Disorders in Domestic Violence

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Abstract

This study aimed to research individual difference, as well as the involvement of associated pathologies and personality disorders in the domestic violence phenomenon. It also traced the particularities of each type of act committed and the patient's evolution, as well as common elements between psychiatric comorbidities or personality disorders, all this in order to become better able to prevent conflict situations within families. This research required qualitative and quantitative descriptive statistical analysis of several aspects regarding the subjects, both from a forensic and a psychiatric point of view. The results confirm forensic research regarding psychiatric comorbidities and personality disorders involved in acts of domestic violence. It also recommends furthering the topic through other studies in the field, in order to discriminate psychiatric vulnerabilities from other mental and personality disorders in acts of domestic violence, for the purpose of identifying and validating treatments and/or marriage counselling solutions to prevent and fight the phenomenon.

Keywords: psychiatric comorbidities, personality disorders, domestic violence, individual differences

1. Introduction

Domestic violence is a global public health issue, as shown by Trevillion and his colleagues [1]. Its pandemic nature and the seriousness of the situations this phenomenon generates forces one to seek solutions in order to stop or at least limit its consequences [2]. Domestic violence must be observed and analysed from two perspectives – that of the aggressor and that of the victim – in all its medical, psychological, legal and social aspects. Domestic violence manifests on several levels; it can be verbal, physical, sexual or psychological [3], [4].

There are multiple ways to analyse aggression within the family. One of the objective elements is psychiatric forensic testing. This is carried out by respecting all legal regulations in force, as well as all ethical norms [5]. Forensic institutions are the only entities which can provide the legal system with medical data, which is why they approach the circumstances under investigation in a global manner, taking into account medical, therapeutic, psychological, psychiatric aspects, all the way to establishing cause of death in fatal situations.

Identifying the motivation or context of such unhappy events is required in order to reduce the spread of the phenomenon and its consequences and in order to find efficient response and victim protection methods. Psychiatric forensic assessment is required in order to clarify such circumstances. At the same time, given the high likelihood of repeat offense, another goal of this research, as well as of other studies we have consulted, is to contribute to prevention [6].

2. Forensic Psychiatric Approaches

In case of domestic violence, the victim's medical state is always primordial, so that the first action carried out is a medical-therapeutic one. However, the next stage medical staff must complete is notifying the authorities [7], [8]. As Beliș shows [9], the most common injuries are less serious ones, such as bruising, haematoma or excoriation. But there are also numerous circumstances when the victim's life is in peril or when the consequences are fatal. Dermengiu underlined the existence of states of invalidity or infirmity caused by the traumatic lesions suffered as a result of domestic violence [10].

According to the Romanian Criminal Code, in the case of offences committed against a family member, the offence is classified the same way, but punishment is increased by a quarter compared to common offenses against someone's life, bodily integrity or health [11].

Lawmakers considered this situation to be one with aggravating circumstances. There is also the possibility of issuing a restraining order as a legal safety measure for such moments. Even so, regulations can be improved.

One of the most commonly encountered disorders in aggressors is paranoid schizophrenia, as shown by Hanlon *et al*., [12] and Tribolet-Hardy F. & Habermeyer [13]. Rigorous mental hygiene helps prevent this pathology, while the prophylaxis of this disorder and of its onset circumstances is precisely the treatment for repeat offenses in family aggression [14], [15], [16].

The problem is that it debuts in young individuals, and many times specific signs and symptoms are not recognised or even ignored. Thus, the relationship between domestic violence and psychiatric pathology is known [17] and it requires specific resources [18]. Also, one of the roles of psychiatric forensic assessment is that of establishing a certain diagnosis for the examined individual. The assessment committee consists of a forensic medical specialist, but also psychiatrists and psychologists, each with their particular importance, as specified by Gbadebo-Goyea and collaborators [19].

From a social standpoint, according to Joseph *et al*., traumatic events are in direct relation with the family's living standard [20], while Anderson *et al*., showed that most of the times, they are not the first such episodes [21], therefore there are multiple opportunities for intervention [22], [23]. Psychiatric forensic assessment also shows the negative social and legal outcomes of domestic violence. The most serious consequences are homicide; with regard to this, we support Delcea's idea that analytic reasoning in cases of homicide has not been elucidated [24].

3. Study Methodology

3.1 Research Objectives

The scope of this research is to trace individual human differences in domestic violence, as well as to clarify the contradictions which occur in the relationship between criminality as a personality trait, other psychiatric patterns and comorbidities considered to be defining elements in homicide and domestic violence.

The hypothesis starts from the assumption that subjects who have committed homicide/domestic violence have psychiatric personality disorders, compared to those who have not committed such acts.

3.2 Research Instruments

The Millon® Clinical Multiaxial Inventory-III (MCMI-III) was used to assess and test mental and personality disorder. Another research instrument was the Mini-Mental State Examination-II (MMSE-II) for cognitive deterioration and the Adaptive Behaviour Assessment System II

(ABAS-II) to assess degree of handicap and eligibility for social services in individuals with comorbidities. Finally, a psychiatric forensic examination was performed.

3.3 Participants

123 respondents took part in this research, 50% from the urban and 50% from a rural environment, classified into three groups (41 people from the experimental group, 50% female 50% male with the average age of 45, average educational level 12 grades; 41 people with comorbidities, 50% female 50% male with the average age of 49, the average educational level 12 grades and 41 healthy people, 50% female 50% male with the average age of 55, average educational level 12 grades).

3.4 Work Procedure

Three groups were proposed in this research: an experimental group of participants who had committed acts of domestic violence or homicide and had personality disorders, a control group of participants with psychiatric comorbidities and other associated diseases, who had not committed homicide or acts of aggression within the family, and the last control group consisting of participants who had not committed acts of homicide or domestic violence, and who did not suffer from any psychiatric disorders or organic diseases. Selection criteria were proposed for the three groups as follows: the experimental group, subjected to psychiatric forensic assessment, having committed homicide and acts of domestic violence, consisted of 41 male and female individuals, aged between 18 and 90, having an educational level ranging from 10 grades to higher education and coming from both urban and rural environments.

The first control group, having undergone a psychiatric forensic assessment, without having committed homicide and acts of domestic violence, consisting of 41 male and female subjects aged between 18 and 90, with an educational level ranging from 10 grades to higher education and coming from both an urban and a rural environment, with organic comorbidities and other associated diseases, having been considered fit to be put under interdiction, lacking the ability to care for themselves. The second control group consisted of 41 male and female individuals aged between 18 and 90, who had an educational level ranging from 10 grades to higher education and came from both an urban and a rural environment, who had undergone a psychiatric forensic assessment, had not committed homicide or acts of domestic violence and presented no psychiatric disorders or organic diseases.

Between-group (the domestic violence group and the non-domestic violence group) data was centralised with a focus on mean and standard deviation. The descriptive statistics table contains the following information for each group determined by the scores of the factor variable: number of participants in the 3 groups (123N), mean = 0.6667, standard deviation = 0.473333, standard error = 0.04268, confidence interval for mean) = 0.7480, extreme scores, statistics specific to the analysis model we requested (with systematic or random effects).

Selection took place from the database belonging to the Institute of Forensic Medicine in Cluj Napoca, Romania. Based on the criteria presented above, the group categories above were indexed and standardised taking into account the objective results mediated by the psychiatric and psychological assessment and testing instruments used during the psychiatric forensic assessment.

3.5 Results

Table 3.1 shows the following data regarding the mean and standard deviation of each research item. For instance, the table presents mean and standard deviation for each separate group regarding sex (Sexvd, m = 1, 10/SD 0.300), age (Agevd, m = 40.59/SD = 14.68), education (Svd, m = 2.37/SD = 0.859), environment (Evd m = 1.37, SD = 0.488), family environment (FEvd, m = 17, SD = .381). The table containing the descriptive statistics results

can be consulted in detail. All the data below centralise mean and standard deviation for the scores and variables invoked in the research.

Table 3.1 Descriptive Statistics Domestic violence and homicide group

		Statistic	Bootstrap[a]			
			Bias	Std. Error	95% Confidence Interval	
					Lower	Upper
Sexvd	N	41	0	0	41	41
	Mean	1,10	,00	,05	1,02	1,20
	Std. Deviation	,300	-,011	,071	,156	,401
Agevd	N	41	0	0	41	41
	Mean	40,59	-,01	2,24	36,59	45,07
	Std. Deviation	14,680	-,334	1,661	10,973	17,349
Svd.	N	41	0	0	41	41
	Mean	2,37	,01	,13	2,10	2,63
	Std. Deviation	,859	-,021	,091	,666	1,015
Evd	N	41	0	0	41	41
	Mean	1,37	,00	,08	1,22	1,51
	Std. Deviation	,488	-,007	,025	,419	,506
FEvd	N	41	0	0	41	41
	Mean	,17	,00	,06	,07	,29
	Std. Deviation	,381	-,011	,055	,264	,461
Sexpi	N	41	0	0	41	41
	Mean	1,49	,00	,08	1,32	1,66
	Std. Deviation	,506	-,007	,010	,471	,506
Agepi	N	41	0	0	41	41
	Mean	58,73	-,04	3,67	51,52	66,05
	Std. Deviation	23,189	-,403	1,751	18,820	25,986
Spi	N	41	0	0	41	41
	Mean	2,00	-,01	,22	1,56	2,41
	Std. Deviation	1,378	-,022	,102	1,157	1,543
Epi	N	41	0	0	41	41
	Mean	1,49	,00	,08	1,32	1,63
	Std. Deviation	,506	-,007	,010	,471	,506
FEpi	N	41	0	0	41	41
	Mean	2,27	-,01	1,98	,20	6,32
	Std. Deviation	12,612	-2,835	7,654	,401	21,311
Sexm	N	41	0	0	41	41
	Mean	1,51	,00	,08	1,37	1,66
	Std. Deviation	,506	-,006	,009	,471	,506
Agem	N	41	0	0	41	41
	Mean	75,63	,07	2,53	70,32	80,10

	Std. Deviation	16,542	-,803	4,237	8,836	24,144
Sm	N	41	0	0	41	41
	Mean	2,54	-,01	,14	2,24	2,80
	Std. Deviation	,897	-,018	,108	,673	1,096
Em	N	41	0	0	41	41
	Mean	1,22	,00	,07	1,10	1,37
	Std. Deviation	,419	-,006	,047	,300	,488
Fem	N	41	0	0	41	41
	Mean	1,93	-,01	1,76	,07	5,54
	Std. Deviation	11,224	-2,533	6,826	,265	18,964
Valid N (listwise)	N	41	0	0	41	41

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Group data was centralized (domestic violence group and non-domestic violence group) regarding mean and standard deviation. The descriptive statistics table contains the following information for each group determined by the scores of the factor variable: number of participants in the 3 groups (123N), mean (0.6667), standard deviation (0.473333), standard error (0.04268), Confidence Interval for Mean (0.7480), extreme scores, statistics specific to the analysis model requested (with systematic or random effects).

Table 3.2 illustrates the results from testing homogeneity of dispersion, by using the Levene algorithm, (12,499), and the figures in the table confirm non-homogeneity of variances. From the point of view of variance analysis, results (Sig .001) show that the groups differ from each other significantly.

Table 3.2 Domestic violence and homicide group (Test of variances homogeneity)

Levene Statistic	df1	df2	Sig.
12,499	1	121	,001

Table 3.3 presents the results of the variance analysis (ANOVA), indicating the extent to which the three groups (G experimental, G1 control, G2 control) have very different means due to the different sample of research participants. The one-way ANOVA method was used. The results below (F = 9.800/Sig. = 0.002) show a significant difference, which means that the groups are distinct and unrelated.

Table 3.3 Domestic violence and homicide group **(ANOVA)**

			Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	(Combined)		2,048	1	2,048	9,800	,002
	Linear Term	Unweighted	2,048	1	2,048	9,800	,002
		Weighted	2,048	1	2,048	9,800	,002
Within Groups			25,285	121	,209		
Total			27,333	122			

Table 3.4 shows the results of using the Brown-Forsythe Test for equality of group differences, by carrying out an ANOVA on a transformation of the reply variable. When one-way ANOVA is performed, one assumes that the samples were extracted from distributions with equal variants. The results below show significance robustness regarding between-group difference.

Table 3.4 Domestic violence and homicide group (Robust Tests of Equality of Means)

	Statistic[a]	df1	df2	Sig.
Welch	8,711	1	62,351	,004
Brown-Forsythe	8,711	1	62,351	,004

a. Asymptotically F distributed

Table 3.5 below centralises between-group data (domestic violence and non-domestic violence groups) regarding mean and standard deviation. The descriptive statistics table contains the following information for each group determined by the values of the factor variable: number of participants in the 3 groups (123N), mean = 0.3821, standard deviation = 0.48789, standard error = 0.04399, confidence interval for mean Lower. 2950/Upper .4692, extreme scores, statistics specific to the analysis model we requested (with systematic or random effects).

Table 3.5 Comorbidity Group. Descriptive

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Between–Component Variance
						Lower Bound	Upper Bound			
,00		82	,1294	,33765	,03662	,0566	,2022	,00	1,00	
1,00		41	,9474	,22629	,03671	,8730	1,0217	,00	1,00	
Total		123	,3821	,48789	,04399	,2950	,4692	,00	1,00	
Model	Fixed Effects			,30790	,02776	,3272	,4371			
	Random Effects				,43752	-5,1771	5,9413			,33272

Table 3.6 shows results of the dispersion homogeneity test by using the Levene algorithm (7.396), and table figures confirm non-homogeneity of variances. From the point of view of the variance analysis, results (Sig .007) show that groups significantly differ from each other.

Table 3.6 Comorbidity Group. Test of variances homogeneity

Levene Statistic	df1	df2	Sig.
7,396	1	121	,007

Table 3.7 illustrates the results of applying variance analysis (ANOVA), indicating the extent to which the three groups (G experimental, G1 control, G2 control) have very different means due to the different participant samples. The one-way ANOVA method was used. The results below (F 185.325/ Sig. .000) show a significant difference, which means there are three distinct and unrelated groups.

Table 3.7 Comorbidity Group (ANOVA)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	17,569	2	17,569	185,325	,000
Within Groups	11,471	121	,095		
Total	29,041	123			

Table 3.8 presents the results of performing the Brown-Forsythe test for equality of group difference based on carrying out an ANOVA on a transformation of the reply variable. When a one-way ANOVA is carried out, one assumes that samples were extracted from distributions with equal variants. The results below (Welch/Brown-Forsythe, 248.825, Sig. .000) show significance robustness regarding between-group difference.

Table 3.8 Comorbidity Group. Robust Tests of Equality of Means

	Statistic[a]	df1	df2	Sig.
Welch	248,825	1	102,555	,000
Brown-Forsythe	248,825	1	102,555	,000

a. Asymptotically F distributed.

4. Discussions and Conclusions

The results obtained significantly confirm our research hypothesis. The experimental group obtained significant differences compared to the two control groups, which leads us to state that personality disorders, Delcea C, Enache A. [24] are a predictor of criminality. Homicide and domestic violence are mediated in individuals with personality disorders and other associated comorbidities. Numerous studies Delcea C, Enache A, Stanciu C, [25], Delcea C, Enache A, Siserman C. [26], Gherman C, Enache A, Delcea C. [27], Delcea, C., Fabian, A. M., Radu, C. C, Dumbravă D. P. [28], Rus, M., Delcea, C., Siserman C., [29], Siserman, C., Delcea, C., Matei, H. V., Vică M. L. [30], Gherman, C., Enache, A., Delcea, C., Siserman C., [31] confirm our results with regard to personality disorders being a strong indicator in the development and maintenance of homicide and acts of domestic violence. Given this situation, we believe our research to be a positive contribution to the literature, despite the study's limitations.

One such limitation can be that a participant's behaviour may change during the assessment.

Knowing they are being assessed, individuals in the work group may influence various manifestations or reactions by which their mental life is externalised.

Results are limited in the sense that the sample (123 people) is not so representative numerically, but future studies can complete and clarify trans-paradigmatic theories on violence and murder. An obvious paradigm with which we agree is that the topic is inexhaustible and requires periodic updates. The study directions of our group of researchers are focused on this end.

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Multiple Methods of Self-Annihilation – Case Report

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Abstract

Suicide is defined as the act of taking one's own life voluntarily and intentionally. It also represents a global health and social problem, which is determined by a myriad of factors, many of them not completely understood. In suicide cases, the victim is also the perpetrator, death occurring violently and unexpected. More often than not, their death leaves behind grieving family members and friends who find it difficult to project their emotions of guilt on other people but themselves. There are virtually countless methods for achieving this feat and quite frequently, victims of suicide choose more than one, which can be a precise indicator of their determination for self-harm and that can pose a challenge to medico-legal experts in establishing the cause of death. This paper presents a suicide case involving two consecutive methods of self-harm, which ultimately resulted in the victim's death.

Keywords: suicide, poisoning, slash wounds

1. Introduction

Suicide represents a worldwide public health problem, with close to 800.000 global deaths per year. It can be the result of mental illness, socio-economic struggles, recent or old psychological trauma. On a case-by-case basis, it is almost impossible to pinpoint the exact reason that led to self-annihilation. Due to the polymorphic nature of suicide, it is problematic to differentiate an attention-seeking attempt from an authentic final act. It is safe to say that people who use multiple successive methods for self-annihilation are more determined to end their life and are not just sending a distress signal.

2. Study Methodology

The case of a 72-year-old male is presented, who was found deceased in his home, lying on the sofa located on the first floor, presenting two cervical slash wounds. The authorities immediately requested an on-scene medico-legal examination of the body. The preliminary examination noted that rigor mortis had already set in and the presence of two parallel slash wounds in the left posterior-lateral area of the neck. A knife with a blade length of 13 cm with traces of dried blood was found near the body. A few feet away, there was a black suit neatly placed, hanging from a dresser's door. On the nightstand, there was an opened clear plastic bag, with the inscription "Copper Sulphate" containing blue powder.

Copper Sulphate is mainly used in agriculture as a fungicide, but also in plumbing, production of batteries and industrial applications such as textiles, leather and pyrotechnics [1].

It is highly toxic when ingested, leading to corrosive lesions of the digestive tract and ultimately to multi organ failure and death [2].

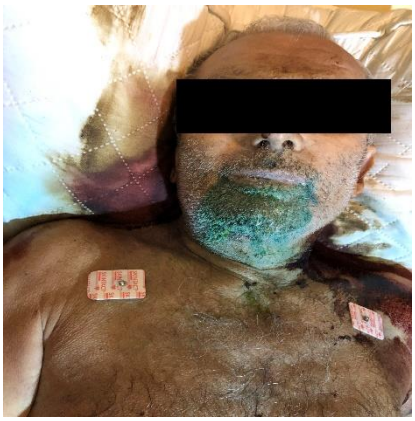

Fig. 2.1 On-scene examination of cadaver showing traces of blueish substance in perioral region and dried blood in cervical region

Near the bag, there was a glass half-empty with blueish liquid. Traces of the same substance were also located on the body in the perioral area (Fig. 2.1). A suicide note was also found, explaining that he had left all his affairs in order, but nothing to clearly reveal the motivation behind it. Taking into account the diligent preparation (funeral suit is taken out, dental prosthetics removed, no family members at home, two methods of self-annihilation, and a coherent suicide note) it is safe to assume this was a well-thought-out plan and not the consequence of an acute impulsive event.

3. Results

The next day, an autopsy was performed revealing the two slash wounds of relatively low depth, without any major vascular implication (Fig. 3.1). Due to the location and angle of these traumatic lesions, they were most likely self-inflicted, further excluding any criminal intent. The internal examination noted a green-blueish coloration of the digestive tract (oesophagus, stomach, intestines), respiratory tract (larynx, trachea), and also of the faecal matter (Fig. 3.2, 3.3).

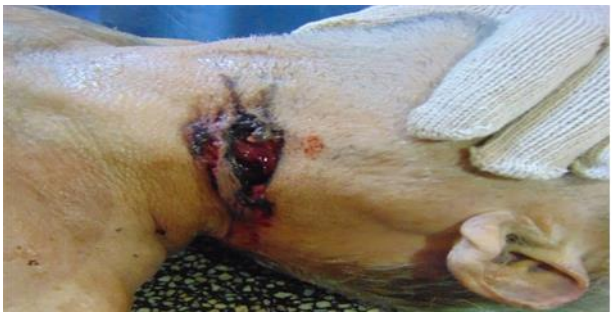

Fig. 3.1 Cervical area, left-side – two transversal parallel slash wounds

The stomach contained a green murky liquid, from which a sample was taken for further laboratory testing. Haemorrhagic areas of the gastric and urinary bladder mucosa were also noticed, most likely the local effect of the copper sulphate, as it is known to cause erosive gastritis. This is a strong indicator that the toxic compound was ingested prior to inflicting the slash wounds, as it completely passed through the system and was most likely fully absorbed leading to acute poisoning. There were no gross signs of visceral anaemia and the cadaveric lividities were well pronounced.

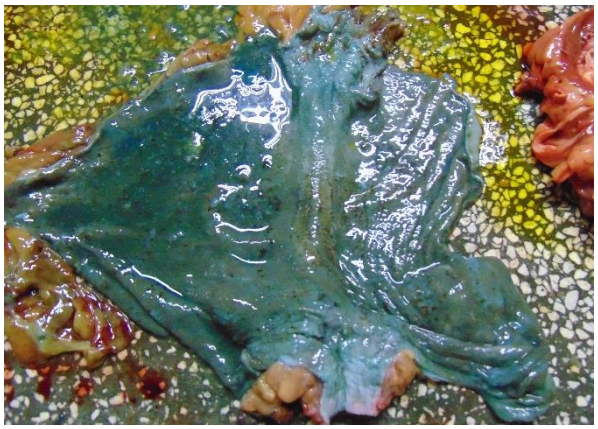

Fig. 3.2 Blue coloration and several erosions of the gastric mucosa

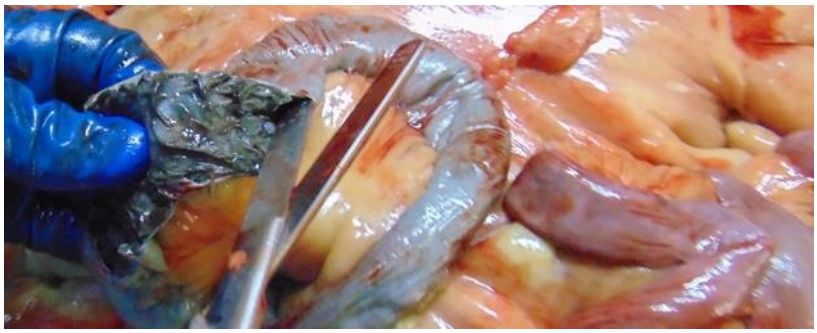

Fig. 3.3 Blue tinted small-intestine mucosa

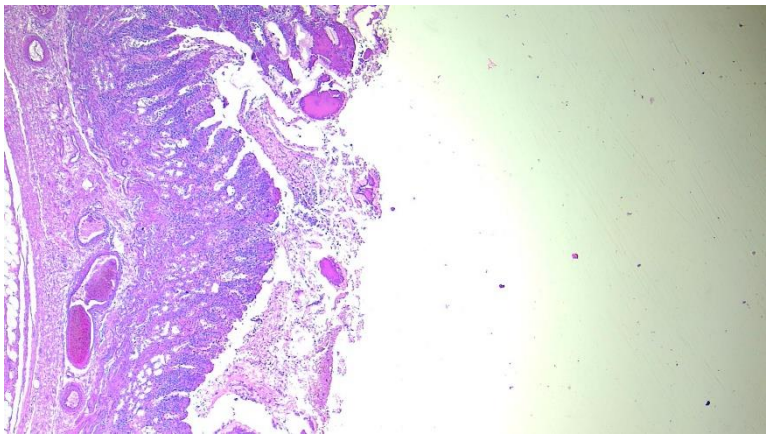

Fig. 3.4 Gastric sample showing small ulcerations of surface epithelium with micro-haemorrhagic areas and vast epithelial cell shedding – Erosive gastritis – HE 4x

The blood sample tested did not contain any alcohol. The histopathological exam revealed minimum haemorrhagic infiltrate in the cervical muscles affected by the slash wounds and confirmed the gross aspect of mucosal haemorrhaging of the stomach and urinary bladder (Fig. 3.4, 3.5).

In order to correctly determine the cause of death, we had to establish to what extent did each traumatic agent contribute to the person's death. For this scope, we analysed muscle tissue adjacent to the cervical slash wounds to determine the level of haemorrhagic infiltrate present, which came back as minimal.

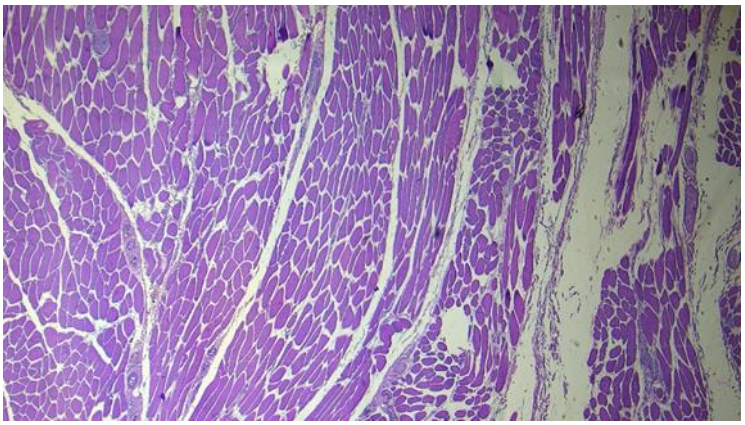

Fig. 3.5 Skeletal muscle fibres showing micro-haemorrhagic areas in the interfibrillar connective tissue – Minimal haemorrhaging of latero-cervical muscle tissue, HE 4x

With this information and considering the lack of visceral anaemia and the presence of intense lividities on the dorsal area of the cadaver, we were able to disprove external haemorrhaging as the cause of death, rendering the slash wounds as non-lethal. Moreso, the gross examination of the digestive tract organs strongly suggested that the copper sulphate was well absorbed into the victim's system, as it was already present in faecal matter and had already caused focal erosions in the urinary bladder mucosa [3]. This reasoning was confirmed by toxicological reports which came back positive for copper and sulphate ions. Taking all of this into account, the cause of death was established as acute fungicide poisoning with copper sulphate.

4. Conclusion

The final act of suicide is always a dramatic event, moreso when the victim chooses to enforce several means of ending their life, reflecting the determination by which they act. In those moments, in all likelihood, the need to end their inner conflicts becomes so overwhelmingly urgent, they feel compelled to act excessively violent towards themselves. This multifaceted method of suicide compels medico-legal professionals to distinguish between several traumatic agents and to accurately determine their impact in thanatogenesis, a feat which at times can prove a challenge even for the most experienced of experts.

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The Portrait of Inmate Mothers from Romanian Prisons – Case Study

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Abstract

Theories underline the negative health consequences of stress-combined with the conceptualization of incarceration as a stressful, isolating, and stigmatizing life event. Building on these insights, as well as other research suggesting that incarceration is negatively associated with individuals' finances, family ties, and physical health, we were interested in Proctor's (2009) four major "hooks for change" that inmates could use to overcome the negative consequences of imprisonment and move away from criminal lifestyles.

Keywords: inmate mothers, prison harms, imprisoned mothers support group

1. Introduction

The prison phenomenon is more than just the prison (construction/institution), it includes the effects of prisons on society and society's interpretation about prisons, the way in which criminals think about prisons, their role and effect [1].

The number of women incarcerated in the United States has increased by 832% over the past 35 years [2]. During the period 2005 to 2015, in Europe, the percentage of women inmate raised with 11%, although the total rate of imprisonment dropped out in time. In 2005, 4.7% from the inmates were women compared with 2015, when the percentage was 5.2% [3]. The reasons for the increase in women inmates can be related to low socioeconomic status and drug or substance abuse [4], [5]. Because they lack consistent employment, or have inconsistent family support, women may turn to crime such as robbery or fraud. These nonviolent crimes are committed out of poverty, addiction, and abuse [6], [7].

Parenting is stressful especially as children experience different stages of development. The incarcerated mothers face a range of other stressors as well. Many of the inmate mothers have children being cared for by family members, partners, or the foster care system, and this separation can cause increased stress [8].

Reflecting on potential prison harms at least three categories can be discussed: classic prison harms, inherent prison harms and immanent prison harms. When taking into consideration classic prison harm one can consider:

a. Prisonization: the inmates learn new criminal acts from each other, the inmates organize themselves into gangs.
b. Deprivation: the inmate suffers a lot from anxiety, and from very painful and highly distracting feelings of preoccupation, they are not be able to concentrate effectively on their work or tasks.
c. Labelling theory focuses on the linguistic tendency of majorities to negatively label those seen as deviant from norms. The concept explains how the self-identity and behaviour of individuals may be determined or influenced by the terms used to describe

or classify them, and is associated with the concept of a self-fulfilling prophecy and stereotyping (Data processed by American researchers since the 1930's).

As inherent prison harms, defined as harms already present in a person's life, and amplified during the time spent in prison, the following can be listed:

a) Low socio-economic status of the inmates will result in social poverty, also because of the prison the bond between the criminal and his/her family and a friend weakens, the individual becomes isolated.
b) Mental deficit: mental retardation which requires special attention in prison.
c) Victimization: to punish or discriminate against selectively or unfairly.
d) Bullying: the maltreatment of inmates of the same age.
e) Gang phenomenon: the belonging to a certain criminal interest group.
f) Drug consumption: use of drugs for non-therapeutic effect.
g) Institutionalizing: orphanage, hospital, mental institute, social home for the mentally challenged, fugitive status, homelessness.

Immanent prison harms aren't always obvious in the eyes of society, but they can be recognized as well. The inmates themselves feel these harms affecting them. They frequently express it by writing poems, creating drawings, or tattoos.

According to the International Centre for Prison Studies, the prison population in Romania at 25.10.2011 was 29,963. 16.4% of which consisted of prisoners on remand. The prison population rate was 140 per 100,000 based on an estimated national population of 21.4 million at end of October 2011 (from Eurostat figures) [1].

At the end of May 2010, female prisoners made up 4.6 % of the total prison population.

When analysing the female prisoner's percentage in Europe, in the prison population, one could see, that Romania is on 31st position with 4.6% on a scale from 1.6% in Montenegro to 16.4% in Andorra [1].

2. Methodology

Women are a small minority of the prison population, but this minority has special needs and rights. In Romania we organized 8 groups of "Discussion Groups for Imprisoned Mothers" (Imprisoned Mothers Support Groups).

The place and number of groups

Two groups of inmate mothers were organised in Târgșor Woman Prison – (2x15 person), six groups of inmate mothers in Gherla Maximum Security Prison's External Section: Cluj-Napoca – (6x15 person). Those groups were coordinated by one facilitator for each group. Initially 15 mothers were enrolled in each group (6*15). Inmate mothers enrolled were grouped on the basis of their children's developmental stage: Gr.1: Adolescence (12-18 years old), Gr.2: Children in middle childhood (6-12 years old), Gr.3: Adolescence (12-18 years old), Gr.4: Children in middle childhood (6-12 years old), Gr.5: Adolescence (12-18 years old), Gr.6: Children in middle childhood (6-12 years old), Gr.7: Children in middle childhood (6-12 years old), Gr.8: Adolescence (12-18 years old)

A number of 11 sessions was applied in case of each groups. The mean number of participants (per group) attending the sessions conducted were: Group 1: 14.54 participants, Group 2: 14.45 participants, Group 3: 14.63 participants, Group 4: 14.36 participants, Group 5: 14.27 participants, Group 6: 14.36 participants, Group 7: 13.45 participants and Group 8: 14.72 participants.

When talking about the activities organized in Cluj-Napoca, the inmate mothers were very interested to participate, first of all because of the topic, and secondly, because they considered an important possibility for them to have something new in their everyday life. Cluj-Napoca Prison is not a very large prison, only a few women have the possibility of working, so they are

all the time in their cells. They enjoyed participating on these sessions because it was interesting and also a good way to bring something "positive" in their everyday life.

They also brought a lot of pictures of their families, especially of their children. One of them even said that these sessions are "like air" for them, bring them back to their "normal" life, bring them answer to a lot of questions regarding their children's behaviour, and regarding their partners' behaviour. They declared that they really felt a benefit from these sessions.

The sessions were organized weekly, and the inmates waited very impatiently week by week to attend the sessions. The people not participating were ill, or in transit in another city for trial.

The life histories of these women offenders were characterized by extreme social and economic disadvantage, the same results as Frye & Dawe underlined [9]. They were disproportionately poor, undereducated, and unskilled [10]. They have been victims of sexual or physical abuse, poverty, and substance use. These are the common pathways to crime according to [11].

The following facts about inmates' lives have been discovered throughout our research:

1. Their childhood environment was characterized by: instability in their home life, including being bounced from home to home; early poverty – sometimes it was severe; volatile and sometime abusive relationships between parents were mentioned; difficulties with school system; difficult and/or numerous stepparents; face rejection and abuse inflicted by their biological peers.

2. The period of their adolescence was characterized by: difficulties with school system, which can lead to dropping out; engaging in early marriages/unions; participating in illegal activities, including substance abuse, with deviant peers; arrived at the "Doorway to Female Criminality".

3. In adulthood they: associated with deviant men, which lead to further sexual/physical/emotional abuse and increased their involvement in illegal activities and substance abuse; also we could find deeper immersion in substance abuse, that leads to imprisonment, and more serious involvement in criminality, which is similar with what Proctor described [12].

Proctor stressed upon the fact that inmate mothers in prison experience an unparalleled sense of isolation added to the pains of women's imprisonment are the frustration, conflict, and guilt of being both separated from and unable to care for their children, difficulties in maintaining relationships with their children have ramifications for the prisoners' parenting roles [13].

The most commonly identified issues are: the prisoner's loss of parental authority over their children, the prisoner's inability to protect their children, the physical separation of parent and child contributes to emotional distancing in parent-child relationships, there are severe constraints within the prison system that impact on a prisoner's capacity to participate in decision-making regarding their children, losing day-to-day contact with their children usually results in prisoners getting out of touch with the detail in their children's lives.

They are also confronting with mental health problems: conduct disorders, oppositional and attention - deficit disorders, schizophrenia, bipolar disorder; and Health risks (healthy inmates entering prison): tuberculosis, drug problems. On the long term, one of the most negative impacts on inmate women's is the social stigmatization: the label of a "bad mother", and the "self-imposed punishment".

The inmate identity issue is a logical one to appear in these cases. The answer for the question "Who am I?" is "I am an inmate". Nothing else is important, but the fact that they are part of a special category, the inmates. There is a clear stigmatization of role and status when a woman is imprisoned.

The woman inmate is discredited in the larger world, with its social and legal definitions of failings, shortcomings, and handicaps. This discreditation also recategorizes the individual as a

particular kind of social “outsider" because of defined infractions that have occurred in the larger community [13].

3. Case Study

Nora is a 23 years old inmate mother. She participated at individual interviews. She also participated in the “Imprisoned Mothers Support Group”. We have found out that she is incriminated of fraud and tentative of murder. Education: vocational school graduated. Her husband is also in prison because of fraud.

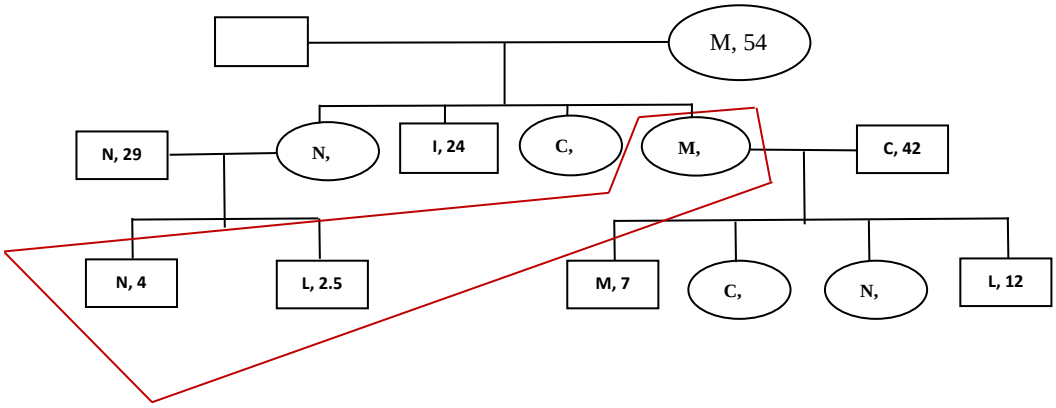

Fig. 3.1 Nora’s Family’s Genogram

Nora’s sister, M. is taking care of her children. Nora’s surviving strategy is not to communicate to anyone, to lock in herself.

The type of intervention used was individual sessions. The intervention activity included 5 sessions, each with a duration of 50 minutes.

About the background:

She lived with her husband’s parents and her two children while her husband was working abroad. She was a victim of her husband and after he left, his father used physical abuse. Once, when her father in law abused her, she took a knife and bruised him. In the meantime, she gets involved into fraud with his husband. He fraud some documents and put her signature on these.

At that moment she and her husband were both in prison.

Her major concerns:

She was and is away from her family. She doesn’t know if her children are safe. She is afraid what could happen to her in prison. She doesn’t communicate with the inmates, because she doesn’t want trouble. She considers herself a bad person.

The starting hypothesis:

Nora considered herself guilty for everything happens to her. She said she found the positive aspects of imprisonment.

First session

Her negative self-esteem was thus observed, and the fact that she couldn’t find any resources to help her survive this period. The objective was thus to develop her real self-esteem and the resources for surviving the period of imprisonment. It is important to notice that she didn’t contact her children yet.

Conclusions of the first meeting were that Nora has a big sense of guilt because of the bad communication with her husband and his family, and also because of the fact that she abandoned her children. She also developed a sense of fear about whether the children will

recognize her after she will be out the prison or not, how will they react, what will the neighbourhood say about her, how could she look in anyone's eyes and so on and so far.

Another problem is the sense of stigmatization, and lack of communication: she doesn't communicate with her sisters or brother (even she knows that her brother could give her material support). She is afraid of them because she considered herself only a "criminal" and thinks that she doesn't deserve their love and support. Our first hypothesis is confirmed, her negative self-esteem contributes to the lack of communication, the lack of possible resources.

Second session

Nora talked about herself. She described herself by using symbols. The symbol she uses was a door with grates. It symbolized her unopened situation. After we used the ECOMAP, we found out that she has nobody to support her. She feels that her family and friends are no longer there for her. She has no positive resources.

Third session

During the third session the issue of her relations was developed, and she declared that: "My relationships are different…, everything is different since I am in prison".

The relationship with her family

Before her marriage everything was on the right path, she had a good relationship with her parents, her brother, and sisters. During her marriage she interrupted the relationship with her family because they didn't support her marriage. Now, when she is in prison, they do not communicate, but her mother sends her packages, and her older sister takes care of her children. "My root, my body and my flowers" were the common and the particular attribute of her family members on three generation, as she said. The common attributes for all the three generations was helping to each other.

She described the three generations from her family like this: the 3rd generation is characterised by robustness, stay the course and positiveness. The 2nd generation attributes were honesty and fidelity as for the 1st generation she indicated persistency and reception.

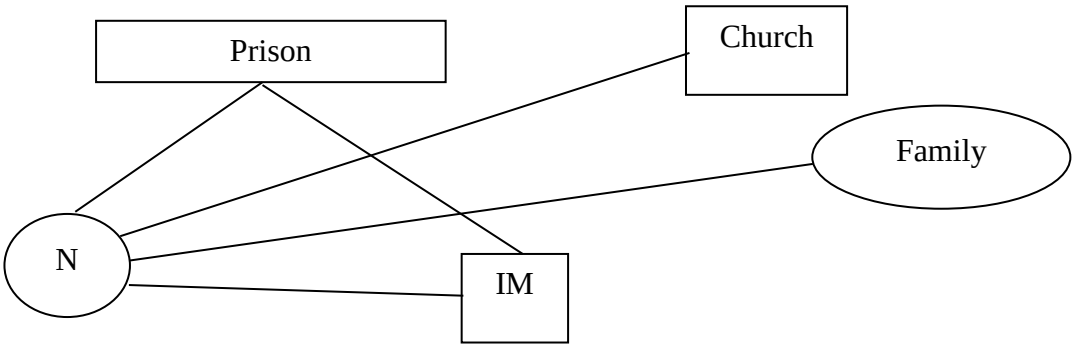

Fig. 3.2 Ecomap

Fourth session

The time-line method aimed what were the most important events during her life, and the identification of possible resources: how can she use her time in a profitable way, why it is important to work, why it is important to go to different programs inside the prison.

Fifth session

The half-sentence method was used for guidance to the future. Themes for this session were the importance of getting in touch with her children and her family, and how to do that. She agreed to keep in touch with the family by letters.

Sixth session

This session was marked by the fact that she got an answer to her letter and the subject of it was around her most important accomplishments. She could tell 5 accomplishments about

herself: accurate, honest, combatant, hard-working, respectful with the people and concluded that, overall, she is not a bad person. This is the first step to offset the inmate identity.

4. Conclusions

The general question is how an incarcerated person can combat the discreditation? Our experience confirms Proctor's [12] "specific hook" theory. He found out three major "hooks for change", and conceivably a fourth "hook" inmates could use to move away from criminal lifestyles.

The first hook for change is finding solace in religion and spirituality, as a coping method with past victimization and to end their criminal lifestyles. They offer to help others, especially by becoming involved with religious groups in prison and setting up prison ministries after their imprisonment ends, becoming engaged in pro-social activities (helping people in nursing homes and children foster care, establishing a toll-free, call-in ministry during imprisonment reminiscent, strengthening their relationship with God and helping others to do the same, ministering to their fellow inmates to ease their pain and suffering.

The second hook for change represented was the aspiration to improve one's vocation (ex – deviant counselling identity – [14]). This can consist, after their release from prison, in working with youth to prevent them from becoming engaged in criminality and ending up in prison, counselling women in prison who have histories of being physically abused by male partners, running programs for pregnant substance abusers, helping families in which substantial physical and sexual abuse is occurring.

The third hook for change was developing increased self-awareness. At this point it is important to understand how they historically undermined themselves (by participating in therapeutic programs within the prison, as well as reflecting on their past), raise their expectations for inmate relationships, no longer letting past destructive relationships trap them emotionally, take care of themselves in a more loving and respectful way, avoid rescuing and enabling those engaged in criminality. They are no longer letting past errors in judgement prevent them from engaging in more productive pro-social lifestyle.

The fourth "hook" for moving away from criminal lifestyles represented the advocating for measures at social level. Numerous studies of authors Delcea C, Enache A, Stanciu C; Siserman C.; Gherman C.; Fabian A. M; Radu C. C, Dumbravă D. P.; Rus M; Matei H. V, Vică M. L. [15, 16, 17, 18, 19, 20, 21, 22] confirm these results.

This specific "hook" can be used to prevent the extensive physical and sexual abuse of girls, which the inmates believe leads to substance abuse and ultimately imprisonment.

A conclusion, considering the importance and complexity of this "hooks" for change with desisting future criminality, is that putting them into practice imply certain amount of policy implication.

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Meta-Analysis Studies from the Perspective of Normative and Descriptive Theories in the Case of Committers of Murder

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Abstract

There are several extremely serious offences, such as organised crime, terrorism and the activities of extremist paramilitary groups, which have in common the "econ" type of rationality, while murder, domestic and sexual violence and robbery are mediated by early conditioned and unconditioned maladaptive emotional cognitions and schemas, doubled by visceral factors. As a result of the scientific contributions of Herbert Alexander Simon, Milton Frienman, Gary Stanley Becker and Daniel Kahneman, Robert J. Shiller, two scientifically validated paradigms have been elaborated on this subject: a normative one and a descriptive one. It has been noted that discrepancies exist in the conceptualisation of decisional processes.

This study aims to approach/investigate in a meta-analytic manner the decisional process involved in murder from the point of view of normative and descriptive theories and of cognitive paradigms.

Keywords: theoretical-experimental models, psychopathology, decision, murder

Introduction

The normative theory refers to the computational potential for representation and rational calculation of the informational processing carried out by the decision maker, so that any decision reached is real and logical. This theory has formulae for representation and computational calculation for decision making under conditions of uncertainty/certainty, multi-attribute type under conditions of uncertainty/certainty, for decision making under risk conditions and multi-stage type or group/social decisions. The second paradigm, named *descriptive* or *limited rationality*, takes into account deficits of time resources and cognitive data, due to processing large amounts, so that the individual will not relate to cost-benefit or the optimal version, but rather to the satisfactory calculation formula. This means that *satisfaction* is mediated by subjective cognitive or affective and/or emotional perceptions.

The theories above have majorly contributed to the description of human decisional styles, but they are insufficient in approaching the decision-making process in the act of murder. Most studies on decision making have been validated on consumer behaviour, on decision making in non-clinical conditions and on the optimisation of professional performance in the banking and industrial field and other associated fields. There are very few studies carried out from the point of view of limited rationality in the case of premeditated murder, terrorism and robbery, and existing studies are based on variables such as the visceral factor, maladaptive cognitive and emotional schemas as predictors of crime. There is also a great deal of criticism, given the reduced scope of experimental studies.

Compared to the studies mentioned above, research on personality disorders or psychopathological personality traits bring new theoretical-experimental insight with regard to decision makers who have been convicted for murder. These approaches have a better clinical

conceptualisation and a good description of the decision maker involved in murder. In fact, early maladaptive cognitive schemas can lead to the development of certain psychopathological personality traits, and these traits mediate a decision leading to crime. For instance, the field Separation and Rejection with its five early maladaptive schemas (abandonment/instability, mistrust/abuse, emotional deprivation, deficiency/shame, social isolation/estrangement) described and scientifically validated by Jeffrey R. Young, brings a new approach with regard to personality disorders, one that is much more predictable and robust in outlining the decision maker's profile.

Another approach with regard to the personality of the decision maker involved in murder can be found in H. J. Eysenck's research, being carried out from the perspective of factors which can define a psychopathological dimension of the decision maker involved in murder.

For instance, the paradigm's authors concluded that a high accumulation of neuroticism-psychoticism factors can lead to murder; low scores in extraversion and high scores in psychoticism may develop a personality trait leaning towards addiction and criminality. And these psychopathological personality patterns can mediate a decision leading to murder or to an antisocial lifestyle.

2. Theoretical-Experimental Models

Becker S. G. & Posner A. R. [1] are among the first modern researchers in the field of economic sciences who approach criminality from the point of view of the normative model in the case of decision makers who commit murder, terrorism and cybercrime. From this model's perspective, they explain that a criminal behaviour is guided by a set of economic – rational values and preferences regarding maximal material, social and group benefits and minimal costs (punishment, damages etc), and that this explains the existence of such a high number of murderers, terrorists and even individuals involved in organised crime who adopt this behaviour, due to the disproportionately high financial rewards (benefits) compared to those obtained from legal work. For example, the authors argue that poverty is a predictor of criminality, due to the latter's greatly superior earnings compared to the minimal financial gains of legal activities. Teenagers commit more offences than adults for the same reason: legal work provides a lower income and fewer opportunities for them than for adults, and the crimes committed by the former are mediated by rational cognitions in the field of "liberation", "freedom", "doing what you want" etc. and by cognitions related to the low cost of punishment compared to the maximal perceived social benefit.

Becker S. G. [2] claimed in his works that introducing capital punishment for murderers as a crime prevention method is welcome for two reasons: maximal cost (death) and reduced benefits, i.e. perhaps he/she will feel better if another person is disadvantaged from certain points of view. In fact, one can harm oneself (personal costs) in order to harm others (personal gains).

If Becker's formula is to be applied, one can see in Figure 2.1 how a murderer gives up the K_o units of what he/she uses in order to kill with the help of K_o units. The factor of the exchange between one's own act (cost) and the act that was committed (benefit) against someone, provided by the E_oS_o curve, is established on the one hand by one's ability to adopt a criminal behaviour, and on the other hand by the social and personal costs of preventing the crime. Cost increase (legal punishment, social isolation and stigmatisation, death penalty etc.) will increase the cost of criminality, thus motivating the would-be perpetrator to abstain from committing the crime.

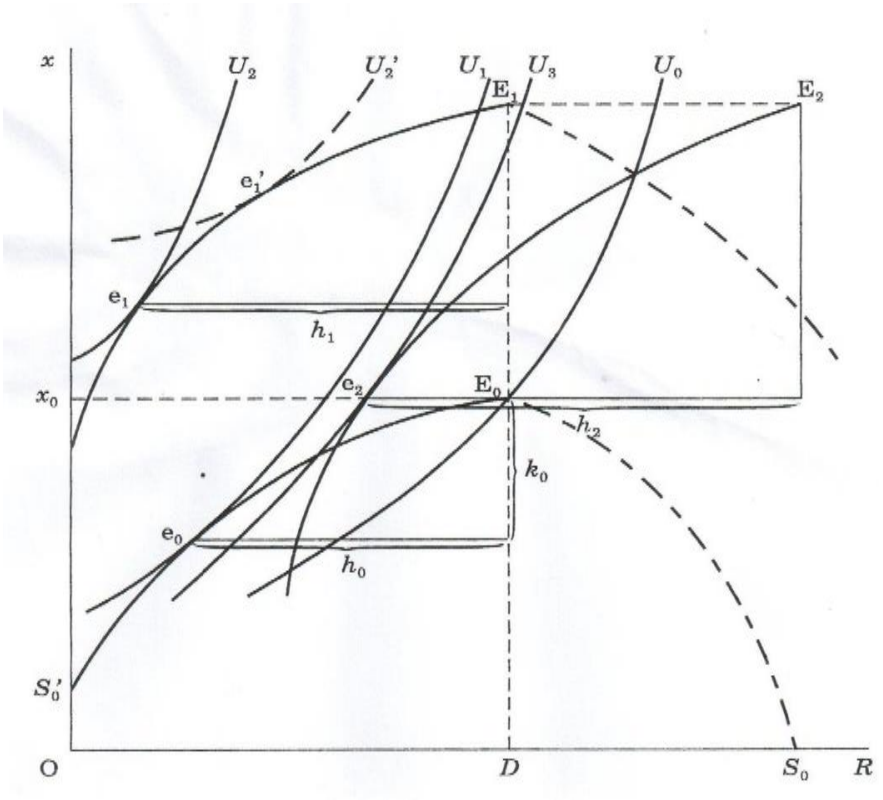

Fig. 2.1 Becker's formula
Source: Adapted after Gary S. Becker, *An Economic Approach of Human Behaviour,* 1998 [2]

McAdams D. [3], a well-known specialist in game theory applied to business, and Franklin C. [4] set out from game theory from the perspective of the normative models of unlimited rationality and from the perspective of psychopath and organised crime studies and propose tools to identify criminals, as well as their categorial patterns. If their theoretical – experimental concepts are used, success strategy in murder could be defined. Thus, one can observe how a murderer actively configures/designs a game. In fact, according to game theory, a decision maker involved in murder uses six strategic tools: *obtaining the victim's commitment, establishing rules* between the victim and the aggressor, *the fusion or collusion* between murderer and victim, *the murderer's riposte*, *the development of values* between the victim and the aggressor and *the psychopathic relationship style* between the murderer and the victim.

These work methods are called behavioural strategies (coping) of psychopaths in their relationship with the victim; they produce effects, developing perceived efficacy in psychopathological need satisfaction in murderers. Most serial killers prove such cognitive-behavioural abilities both in relation to the victim and in relation to the authorities. Observing such "games" developed by murderers, they have become theories which guide police departments and criminal psychologists.

A team of researchers from Cambridge University, consisting of Espejo G., L'Huillier G. and Weber R. [4] have used the Stackelberg method in game theory, by which *a leader faces a single follower.* In the USA, the police must simultaneously deal with more offenders, who can be organised or act independently of each other; it is impossible for the police force to anticipate the next crime. This mathematical application, scientifically validated by researchers, motivates the development of two game models: the first is a classic *leader-follower* interaction between officers and organised criminals, and the second is an interaction between the *leader* and the independent offenders. The aim is that the effect of offence movement under the supervision of the authorities be anticipated by the models proposed. The results, using data from a computer simulated environment, emphasise the way in which these models can provide decisional

support for the authorities, surpassing traditional strategies in the case of individuals who commit murder [5]. Introducing the ASPEN [6] method, another variant of game theory using the Stackelberg method, allows an approach of the mathematical branches and values which overcomes classic limitations in the field of criminality and terrorism, based on two key contributions: (1) a *column generation* approach, which exploits a new representation of the network flow, avoiding a combinatory explosion of programmed assignments and (2) a *branch-and-bound* algorithm, which generates limits by way of a fast algorithm for solving security games with lax programming constraints. ASPEN is the first known method for efficiently solving massive security games with random programs available to security departments, the police and the intelligence field.

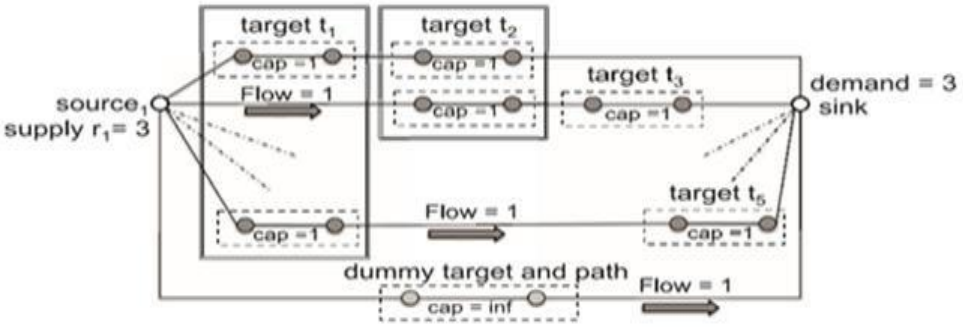

Fig. 2.2 Game-theoretic patrolling with dynamic execution uncertain, 2014

Figure 2.2 presents pathways for 3 of the 5 programs. The pathways correspond to programs {t1, t2}, {t2, t3} and {t1, t5}. Demand and supply are all according to the number of FAMS available. The double bordered box marks the flows used in order to calculate (t1) and (t2) assignment. Each combination scheme corresponds to a feasible flow in G. For example, the common program {{t2, t3}, {t1, t5}} has a flow of 1 unit each, each on the pathways corresponding to programs {t2, t3} and {t1, t5}, and a flow of 1 through the dummy. Similarly, any flow possible through graph G corresponds to a feasible common program, since all resource constraints are satisfied [7], [8], [9].

Szde Yu [10] proposes a rational typology of criminals from the point of view of normative theory, with three dimensions, encompassing *rationality, morality* and *affectivity. Rationality* refers to a criminal's power to make a reasonable choice with regard to maximum benefit, and then to obtain results consistent with one's mental projection. *Morality* is the ethical reasoning which can or cannot rationalise an antisocial act. *Affectivity* is the extent to which criminal behaviour is touched by emotions. From these dimensions stem eight models with points much accessed by a decision maker who commits murder. Table 2.1 shows the strong and/or weak mobility categories in maintaining acts of murder in a decision maker.

Table 2.1. The Criminal Mind Model

Model & Criminal model	Rational M_1 = {1, 2, 3, -8}	Moral M_2 = {1, 2, 3, -8}	Affective M_3 = {1, 2, 3, -8.}
Rational model	100%	100%	≤49%
Moral model	≤49%	≤49%	≤49%
Emotional model	≤49%	100%	100%
Justification model	100%	≤49%	≤49%
Hedonism model	100%	100%	100%
Self-righteousness Model	≤49%	≤49%	100%
Full model	100%	≤49%	100%
Irrational model	100%	≤49%	100%

(Source: Adapted from Yu S. A Typology of Criminal Propensity, 2010 [10])

Other research endeavours abound in conceptualising criminogenic typology on the topic, but due to space constraints, we shall only cite [11], [12], [13]. The approaches above also have limitations – the samples did not have criminal – non criminal vs. clinical – non clinical control groups [14], in order to strongly and predictably discriminate the hypotheses invoked, and those from the field of game theory have used interventions from the point of view of digital (artificial) intelligence and their laboratory results are non-ecological to be extrapolated on a criminal – non criminal and/or clinical – non clinical population [15].

Cornish D. B. and Clarke R.V. [16] are among the first modern criminalist researchers who approach decision making from the perspective of the descriptive model in serial killers and in the case of associated offences. They claim that the decisions of those who kill are made following reasoning which is not limited but motivated by strong emotions, peer pressure and other factors which can interfere with the decision. Their studies [17] on murderers also confirm the "cost-motivated" hypothesis of individuals who commit murder. Their model refers to decisional heuristics mediated by econ factors and cultural-criminal and/or group factors.

Topalli V. Wright R. and Fornango R. [18] bring a new conceptualisation from the perspective of descriptive decisional theory on murderers, emphasising that street crime is a behaviour mediated by bias heuristics in a decision maker accused of street crime. Their research on hundreds of participants who had committed street crime, as well as other studies [48], have shown that feelings of fear, fury, desperation can interfere with the decision, developing a maladaptive behavioural pattern, due to errors in thinking/heuristics which are repeated in the decision-making process.

Hemmingby C. & Bjørgo T. [19] mention the benefits of the "lone wolf" decision maker who adopts a criminal and terrorist attitude to the detriment of the victim, in order to satisfy one's sadistic desires, with a great emotional load as a factor for maintaining and persevering in committing a crime. Researchers start from the case of Anders B. Breivik and bring to the table a lone wolf decisional typology. According to Daniel Kahneman and Amos Tversky's prospective model, the authors show that the "lone wolf" decision maker can represent the world from the perspective of ideology/strategy (*accessibility from memory*), target alternatives (*representativity*) and from the perspective of external and internal factors (*anchoring*), so that he or she develops a terrorist or serial killer behaviour.

Lindegaard, Bernasco, Jacques and Zevenbergen [20], [21] bring new contributions in favour of the "rational – motivated" model with an applied study on 200 respondents, with predictable results following qualitative and quantitative interviews with inmates. Researchers used instruments to test and assess cognitions and emotions in order to identify both the negative and the positive experiences which affected the perpetrators throughout the three stages of a robbery: before, during and after the act. As a result of the interventions, five emotions were recognised as being predominant in a robbery: *happiness*, *aggravation*, *shame*, *fury* and *fear*. Moreover, they show that, while some emotions are experienced during several stages, others are prominent in a single stage, in order to maximise rational-motivational benefits for the criminal decision maker.

Bouffard J.A. [22] adds another study from the perspective of the descriptive model on 352 respondents, of which n=172 male and n=180 female, who were requested to take part in a research regarding cost reduction due to sexual arousal in the case of sexual aggression. Post-intervention studies showed that, in the case of decision makers who commit sexual crimes combined with murder, in relation to the cost-benefit ratio, the decision maker only takes into account the benefit of sexual desire in the shape of aggression leading to death, as an arousal preference. The table below underlines major tendencies in criminals who operate with several techniques for *misleading* the victim: they *inebriate* or *drug* the victim, and/or manipulate the victim in order to carry out the sexual aggression.

Table 2.2 Correlations between the level of sexual arousal and tactics of sexual coercion/force

Tactic type	*E. Total*	*Male*	*Female*
Tearing clothing	.044	−.039	.212**
Victim cheating	.163**	.131†	.144†
Victim intoxicating	.198**	.185*	.178*
Sexual agression	.156**	.131†	.160*

*†p<.10, *p<.05, **p<.01 (two-tailed)*

Results in the table above show that arousal preference inhibits the criminal consequences (costs) of a decision maker who commits sexual aggression, while the aggression itself is the maximum benefit. Strong significant correlations at the threshold **p<.01 also show that an arousal preference may also develop self-efficacy and/or the ability to successfully complete the sexual aggression, apart from arousal benefits. The studies of Exum M. L. and Zachowicz A. [23], [24], [25] also bring the same arguments regarding decision making in sexual crime.

Following his research in African communities and other similar communities in America, Richard B. Felson [26] claims that a criminal may make a decision depending on several types of heuristics: situational/in the moment, based on the illusion of benefit and a material, emotional benefit and/or image capital in one's community. All these decisions based on the four heuristics are rather rational than reactive, or decisions made under the influence of visceral factors. The arguments of Felson R.B. [27] have limited empirical support from the perspective of the descriptive model, due to its conceptual extensions to psychopathological personality traits, without having clinical vs. non-clinical results. However, his research outlines a previously undiscovered aspect regarding the latency of a criminal in decision making in the case of murder mediated by rapid and satisfactory heuristics.

Other studies and research from the perspective of limited rationality in offenders have highlighted the fact that individuals accused of break-ins and vandalism [28], assisted by heuristics which can mediate a decision based on certain information, are motivated to commit offences in order to maximise profit. The same as in the case of car theft, [29], [30], [31], contributions have been brought in the assessment of the risks and advantages of a crime, underlining the way in which these assessments contribute to crime persistence. Carleen M. Thompson and Benoit Leclerc [32], [33] also apply the perspective of rational choice to domestic violence and family murder, where the emphasis falls onto a visceral accumulation, on psychopathological parental loyalty, as well as on image gains in a group where domestic violence and killing are promoted [34].

All these studies have contributed to the generation of new research directions from the perspective of the descriptive model, but psychopathological personality traits and early maladaptive schemas have not been taking into consideration, even if they may mediate a clinical decision in the decision-making process, as well as general cognitive abilities [35]. A question remains: the way in which murder committed by an individual who is intellectually disabled, has psychopathological personality traits or mental disorders can operationalise from the perspective of the normative or descriptive model. [36]. The limitations of these studies can launch new challenges for other researchers in the field of clinical psychology, forensic psychiatry and the criminal sector, in order to develop new theoretical-experimental models in conceptualising the decision-making processes involved in the act of murder [37].

3. Conclusions

This study has indexed an exhaustive analysis of data in the specialised literature with regard to normative vs. descriptive or mixed decisional styles in murderers and terrorists. The goal of this research is to propose new psychometric instruments for psychological assessment and

testing for psychiatric medical-legal evaluation, instruments which can provide good predictability in outlining the clinical conceptualisation picture of the psychopathology of a criminal decision maker, as well as improve methods for standardised clinical interviews in specialised committees.

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Multifactorial Determinism of the Request of Forensic Expertise Regarding Sentence Interruption on Medical Grounds

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Abstract

Incarcerated people represent a particular category of population that for the past few years was often mentioned as being marginalized, subject to different deprivations, besides deprivation of liberty. Objective information, specific to penitentiary environment, is represented by those coming from the institutions with direct involvement in the penitentiary environment. Within the concerns of forensic institutions, specific competences are included by carrying out forensic expertise, at the request of the criminal investigation organs and courts.

The forensic expertise is an important tool in the elaboration of assessments regarding life in detention through various situations approached such as traumatic, psychiatric and also establishing a certain death diagnosis in the penitentiary death cases. Identifying diseases/conditions patients-prisoners have, death causes among penitentiary population and including violence phenomena assessment is the key to identifying the necessary measures in medical assistance and psycho-social or psychiatric measures adjustment, in order to provide the necessary treatment, but also for preventing/neutralizing and reducing the incidence of these phenomena.

Keywords: multifactorial, forensic expertise, sentence interruption.

1. Introduction

Within the large mass of incarcerated people, those suffering of different pathological conditions stand out from the rest because of their special needs and necessities. One should give more attention to this special category in terms of quality healthcare right that should be at a comparable level to community healthcare assistance. Behavioural restructuring appears under the influence of limited penitentiary environment due to the set of institutional rules, but also from the need to adapt to the coexistence among other inmates, to integrate into the new type of community, which aims, among others, an increased susceptibility to influence and suggestibility mainly from experienced colleagues in detention.

One should pay special attention to the provisions applicable to juvenile delinquents that constitute a particular category in terms of psycho-educational development needs during the maturation period. Besides ensuring the compliance with general rights, they need measures that would allow mobilising all available human resources – family, volunteers and community – in order to facilitate the development of a balanced personality capable for reintegration into society.

However, in our country, there are few studies addressing the issue of medical care in the penitentiary and the possibility of sentence interruption on medical grounds. The situation of incarcerated people is a topic of constant concern worldwide and at European level. This must also be seen in the light of joining specific provisions related to human rights and implicitly the right to medical care to which our country has acceded.

The subject proposed in the present work is the approach of multi-factorial determinism of forensic expertise request for sentence interruption on medical grounds. Within the subject, it was necessary to carry out a complex analysis regarding the respect for the rights and medical care of prisoners. Aspects related to legal evolution framework and current provisions were analysed, providing medical assistance situation in the penitentiary environment (specifying the realities regarding morbidity and mortality notions) and doctor-patient relation in forensic expertise carrying out.

Considering detainees access to health care as having a restrictive and limiting aspect (by the fact that the ANP treats inmates within their own health network) it becomes obvious that forensic expertise for sentence interrupting on medical grounds is required as a necessary addition to ensure detainees full access to complete medical care, almost equivalent to medical care that the rest of the population benefits from.

In this respect, the present paper proposes, mainly, the knowledge of the realities regarding informing the prisoners about the framework within which forensic expertise institution operates and an analysis of their perception regarding the accessibility and use of this type of expertise. At the same time, the aim was to identify the cases that abusively exceed the limits of requesting the interruption of the prison sentence on medical grounds.

Personal contributions have materialized in carrying out a series of studies that outline the problematic approach from different perspectives. Thus, in the first part, a retrospective statistical study was conducted on the mortality among the prison population in the area studied.

The hierarchy of the main causes of death among the prisoners, along with other parameters studied, was the starting point in approaching the subject. Further, the next study carried out took into consideration possible links between penitentiary deaths and the institution of forensic interruption of the sentence on medical grounds.

An important chapter of his own contributions included the administration of a structured comprehensively for the proposed issue questionnaire, directly to the people potentially involved in the process for carrying out the forensic expertise, represented by the patients-detainees within one of the largest penitentiary hospitals in the country, the Penitentiary Hospital Dej. The recorded results were processed statistically, for an adequate illustration of the investigated aspects and the outline of a more accurate image of the complex problem represented by the detainees calling on the institution of the forensic expertise regarding the interruption of the sentence on medical grounds.

Last but not least, the purpose of this analysis also aims to identify the issues regarding time required to carry out the forensic expertise and the issues that need to be solved for optimizing the framework in which the forensic expertise is carried out for interruption of the sentence, also referring to the situations that may charge in an unjustified manner the activity of specialized commissions.

2. Guidelines in Legal Medicine Development in Romania and Interdisciplinary Connections

Legal Medicine is a specialty with roots close to the debut of the implementation of medicine in the state of Romania, which took place starting with the 19th century, recorded upon the establishment of the Department of Legal Medicine headed by Mina Minovici. The actual establishment of the Institute of Legal Medicine of Bucharest (the first in the world), originally called the Mortuary of Bucharest City, on the initiative and under the leadership of Professor Mina Minovici [1]. During the communist regime, due to the great professional and moral quality, the independence and impartiality of forensic activity from the interference specific to that political regime is maintained.

After 1989, the components of the network of Legal Medicine in Romania did not undergo significant changes from an organizational point of view, maintaining the structure comprising the "Mina Minovici" National Institute of Legal Medicine in Bucharest (INML) – with territorial branches called External Laboratories located in the country's main academic centres: Cluj-Napoca, Craiova, Iasi, Tirgu-Mures and Timisoara [2].

Since 2000, the Government Ordinance (OG) No 1/2000 (approved by Law 459/2001 and amended by Law 271/2004), established a new organization of the network of Legal Medicine, having at the base the "Mina Minovici" National Institute of Legal Medicine in Bucharest, and establishing Institutes of Legal Medicine (IML) corresponding to the old External Laboratories which became independent institutes, having the County Forensic Services (SJML) and the Forensic Pathology Private Practices subordinated to them in accordance with the existing assignation. [3, 4]

From the point of view of the activity, one can note the ongoing concern regarding covering the widest possible range of potential interferences of the medical and legal sciences, materialized through a wide range of expertise and other forensic work. Through the implementation and development of new branches, a series of tools were created which are useful to respond with the best possible accuracy to the objectives formulated by the criminal investigation bodies and courts. Their role is to analyse and present medical aspects in an accessible form to the competent bodies having an interdisciplinary nature resulting from the various aspects clarified for the judicial process. Thus, acquisitions in the various medical specialties were also reflected in the evolution of the specialty of Legal Medicine which recorded the development of multiple branches: clinical forensics, morgue and histopathology, toxicology, serology, immunology, genetics, biochemistry.

3. Comparison Between the Criminal Codes/Criminal Procedure – Before and After February 1st, 2014 Underlining the Changes in the Provisions of the Legislation

A special place amongst forensic expertise belongs to the Expertise for postponing or interrupting the enforcement of the penalty involving deprivation of liberty on medical grounds, this being at the same time a key link in the relationship between Legal Medicine and Justice.

The aspects relating to this type of expertise have been regulated in the special part of the old Code of Criminal Procedure, in Title III, Chapter. III, Section II (art. 453-454) and section III (art. 455-457). [6] The cases of deferment of the execution of the penalty on medical grounds were laid down in Article 453 (1), letters a and b, and the cases of interruption in article 455.

The execution of the imprisonment penalty or life imprisonment can be delayed/interrupted if it is found, after carrying out a forensic expertise, that the condemned is suffering from a disease which makes it impossible to execute the penalty, until upon treatment, the condemned shall be in the situation of being able to execute the penalty. Within the forensic meaning, a person is considered to be unable to execute a sentence involving deprivation of freedom in the penitentiary, from a medical point of view, in the following situations:

- if the person cannot be diagnosed and treated within the ANP (National Administration of Penitentiaries) network;
- in order to remove, in the case of serious diseases, the risk for the patient to develop serious complications of the disease (which would not have been able to have been corrected at a later date, after the execution of the penalty, and on the other hand, the possible risk of the patient's death because of the disease(s);
- all cases of acute or chronic diseases generating critical states of patients who cannot be delayed and where the possibilities of diagnosis and treatment within the ANP health network are non-existent or unsuitable (but here the possibility to ensure hospital admission for a short period of time, under guard, was stipulated);

- the situation of patients who are in a terminal state, with prognosis appreciated as probably infaust, as stage of the affection they are suffering from;
- the existence of special situations in which, owing to the immediate execution of the penalty, serious consequences may affect the condemned, their family or the unit where they work.
- In the event that a convict is pregnant or has a child younger than one year old (the execution of the penalty could be deferred until the cessation of the cause which had led to the deferral; and we note in this case that the period of deferral may be established only in relation to the legal rules with regard to the leave granted in such situations) [7].

The formulation of the request for deferment of execution of the imprisonment penalty or life imprisonment could be made "by the prosecutor, by the sentenced, by the legal representative, by the defender, by the management of the convict's place of work, and for the defendant, even by her husband" – the people were indicated in the last paragraph of Article 362. Withdrawal of the request for deferral could be made by the person who had made the request. The entry into force of the deferral shall be made on the date of the Sentencing made by the Court.

In addition, in Article 455 there were indications relating to the enforcement of the imprisonment penalty or life imprisonment, to the effect that it could be interrupted in the cases and under the conditions laid down in Article 453, at the request of the people referred to in paragraph 2 of the same article (i.e., by the prosecutor, convicted, etc.).

Article 239 mentions the suspension of criminal prosecution and Article 303 mentions the suspension of the trial phase of the case, where the ability to participate in the phases of the trial does not exist, such as: when the patient has an inherent risk with immediate character for the appearance of severe complications that can create disabilities or there is a risk of death and in the situation of the existence of diseases in terminal state with probable infaust prognosis.

With the entry into force of the new Code of Criminal Procedure [6], the numbering of the item's changes, relating to the above situations and changes in their contents has occurred.

Thus, article 589 in relation to the cases of deferral of the penalty (corresponding to article 453 in the old CCP) makes changes regarding the possibility of deferral of the execution of the penalty with imprisonment or of life imprisonment, specifying instances and conditions:

- the condemned presents a disease state that cannot be treated in the ANP's own health network (proved by performing a forensic expertise) and which causes the impossibility of the execution of the penalty, when the specificity of the disease does not allow treatment by hospitalization under permanent guard within the health network of MS.
- in addition, it is shown that the application of these provisions is only possible if the Court decides that deferring the execution of the penalty and releasing that person does not pose a threat to public order and that the penalty execution can be deferred only for a specified period of time.
- the condemned is pregnant or has a child younger than one year old – the execution of the sentence shall be deferred until the cessation of the cause which had led to the deferral.

There are additional provisions relating to circumstances in which the condemned is excluded from the possibility of benefitting from deferral of the execution of the penalty of imprisonment. Thus, the patient that is in a state of illness due auto-aggression (self-provoked lesions), the refusal of the medical and surgical treatment indicated, and if they abscond from the forensic expertise (or waive it), they cannot be granted deferral of the penalty.

New elements have been introduced, with restrictive nature in respect of the nomination of the people who may make the request of deferral of the penalty execution on medical grounds – the request may be submitted by the prosecutor and the condemned, but it is stated that the management of the penitentiary also has this option. Additionally, it is also mentioned that the

deferral shall be granted for a definite period. One can note the difference from the previous provisions, which stipulated deferral until cessation of the cause that led to the deferral, but also the opportunity opened by the new legislative framework for the formulation of multiple requests and the possibility of benefitting from two or more deferrals.

In addition, there is an indication of the fact that, in the situation in which, for the person benefiting from deferral, a new warrant of execution of the sentence is issued; this can be delayed until the current deferral expires. A new element within the recent regulations is constituted by the provision of the possibility of appeals against the decision of the court.

The obligations of the condemned benefiting from deferral of the penalty on grounds of disease are also provided (Article 590); with reference to the observance of the territorial limits fixed, registration and ensuring communication with the authorities responsible for surveillance. After the release, they shall have to observe each request for appearing before the court, to inform on any changes of residence, to observe the instructions given for carrying out the treatment, and to pay for the care of the children (in specific cases). [5, 6]

The institution of delegated judge has the competence to receive the application/request for deferral/interruption of the penalty (which must be accompanied by medical documents) and it has, depending on the individual case, the competence to resolve the case or to carry out the forensic expertise.

The decision relating to the granting of the deferral/interruption of the penalty on grounds of disease shall be taken by the enforcing Court (Article 591). The decision of carrying out a forensic expertise by the court triggers the stages of the forensic expertise, which, in the end, shall be finalized by the issuance by the forensic institution empowered of a document entitled Forensic Expert's Report (REML) [7]. This forensic document is aimed to inform the court of the result of the evaluation of the patient from a medical point of view, using scientific methods and criteria, and to propose deferral/interruption of the penalty or not. The role of the forensic expertise consists in facilitating a correct decision-making act on the part of the court. [8]

In accordance with Order 1016/2007 on the provision of medical assistance to people deprived of freedom who are in the custody of the ANP (joint order of MJ and MS) in Section 16, concerning the conduct of various types of forensic expertise, the director of the penitentiary and the chief physician have the obligation to submit the people deprived of freedom, for the purpose of carrying out the forensic expertise.

The physician of the penitentiary is part of the forensic expertise commission and shall draw up a medical referral letter on the health status of the people deprived of freedom to be expertized (the drawn up referral shall have to be endorsed by the chief physician and shall be made available to the Forensic Expertise Commission together with the medical documents existing in their medical record). [8]

The clinical and paraclinical investigations necessary for carrying out the expertise (recommended by the physicians in the Commission), are to be carried out in the indicated health units and specialized services, and the physician of the penitentiary will determine whether the disorders can be treated in the ANP's health network or not.

On the occurrence of the death of a person deprived of freedom, the medical and sanitary staff shall immediately report to the director of the penitentiary and the ANP about the possible cause of death and about the circumstances in which it occurred. [9] All cases of death during detention constitute cases with forensic implications and it is mandatory to carry out a forensic autopsy which is ordered by the criminal investigation body attached to the court to which the penitentiary unit is assigned.

Regulations and methodology relating to the carrying out of the forensic expertise for deferral or interruption of the enforcement of the penalty involving deprivation of liberty.

The legislation in this field is supplemented by the Procedural Rules for carrying out expertise, assessments and other forensic work, Article 30 in Section 4 – Assessments and

forensic expertise relating to the person who is alive. [10] The request of the forensic expertise is to be communicated in writing to IML or SJML under whose authority the Expertise Commission operates. The direct examination by the commission of the person who is the subject of the forensic expertise is mandatory.

The Expertise Commission has the following constituents:

a. a medical examiner who is the president of the Commission, designated by the director of the institute;
b. the physician who is the official representative of the ANP health network and who decides, together with the medical examiner, where the indicated tests can be carried out, who specifies whether the treatment of the disease is possible within the ANP's health network or not; in the situation in which the unit of origin of the patient to be examined belongs to a different structure – e.g., in the case of arrests, the Ministry of Administration and Internal Affairs (MAI) – the participating physician is from the network in question;
c. one or more medical specialists in accordance with the type of pathological ailments presented by the convict-patient, these having the role of establishing the diagnosis, stage of the disease and therapeutic indications with the recommendation of the units within the MS network in which they may be carried out. [11]

The schematic of the stages of requesting and carrying out the forensic expertise for the purpose of postponing/interrupting the sentence execution is presented below:

In accordance with recent amendments to legislation, the first expertise relevant to deferral/interruption of the penalty execution on grounds of disease is to be carried out only within the Forensic Institutes and the drawing up of a new forensic expertise may be ordered only within the framework of INML "Mina Minovici" in Bucharest.

A series of special features of the expertise are identified, resulting from the legal provisions referred to in CPP, and the legislation specific to legal medicine. [12] In accordance with the procedural provisions, the initiation of the process of carrying out of the expertise by the forensic institution cannot be made as a result of provisions other than those transmitted by the original.

Carrying out a forensic expertise is an official activity, its nature arising from the fact that this type of expertise is carried out only on the basis of a document (ordinance, motivated resolution, conclusion of hearing) which is issued by a criminal prosecution body or by a court; the ordered work shall be carried out only within the designated forensic institution. The ordinance shall have to have identification elements also attesting its authenticity (header, seal of the issuing unit, registration number and file number, date of issuance and deadline for completion); it shall include particulars relating to the person to be examined (last name and first name, date of birth, first name of both parents, whether they are free or in detention, with an indication of the place of detention, and the capacity in which the person concerned is being expertized, i.e., defendant, accused, or convicted). At the same time, the request should also specify the name and title/rank (clearly) of the person who requested the expertise, with their signature.

For the purpose of establishing the diagnosis it is necessary to carry out certain clinical and paraclinical investigations in specialized sanitary units belonging to MS, depending on the profile of the disease (university clinics or county clinical hospitals are recommended).

Medical documents drawn up after the performance of the specialized examinations indicated shall have to contain the diagnosis of the disease (and co-morbidities recorded) and the therapeutic indications and any other recommendations, and it shall have to meet the methodology-specific conditions of authenticity. In the situation where the patient has already issued medical documents, it is necessary to carry out certain examinations, for the purpose of obtaining an additional opinion. The special character with absolute necessity of celerity should

be pointed out, in order to avoid the extension of the time required for the completion of the forensic expertise and the indication of the appropriate measures.

The physician of the penitentiary must take into account the scales developed periodically by the Medical Direction within the ANP which provides a current image with the illnesses which cannot be treated in the health network of the penitentiaries.

The medical examiner, as president of the commission, also has the following tasks: coordinates the activity of the members of the Commission; verifies the identity of the person examined; legitimates the escort (policeman, gendarme, etc.); supervises the drawing-up and signs the requests for examinations; collaborates with the other members of the Commission in order to establish the correspondence between the clinical examinations and paraclinical investigations; in doubtful or inconsistent cases, he or she orders the re-examination of the person; checks whether during the period of deferral or interruption the therapeutic indications were observed; supervises the preparation of the conclusions of the expertise report; in the case of the absence of the person to be expertized, he or she refers the matter to the body issuing the request. [13]

The findings and conclusions of the forensic commission regarding the deferral or interruption of the penalty execution shall be entered into a Forensic Expertise Report (REML) which shall be signed and sealed by all the members of the expertise commission and shall have to bear the seal of the issuing unit.

It is considered that a person is, from a medical point of view (due to the disease), unable to carry out the custodial penalty, if:

- the pathology they present cannot benefit from qualified medical assistance within the ANP's health network which would eliminate the risk of death or of the occurrence of serious complications, unrecoverable subsequently after the execution of the penalty;
- the ANP health network cannot provide the admission of short duration, under guard, at a specialized sanitary unit (which does not belong to the ANP) with a view to resolving an acute or chronic state, whose treatment can no longer be delayed;
- is in a terminal state due to the unfavourable evolution of chronic diseases, and the infaust denouement is expected.

The person cannot take part in the criminal prosecution or the trial, if:

- the disease they are suffering from is serious and requires hospitalization immediately, due to the risk of death or complications generating disabilities;
- presents neuro-mental diseases with alteration or lack of discernment or with the impossibility of understanding question or answering to these;
- is in a vegetative/terminal state following the development of a serious disease (cancer, hepatic cirrhosis, etc.), with predictable death.

The duration of deferment/interruption of the penalty execution proposed by the Commission shall not exceed three months (exception-chronic diseases with prolonged and serious evolution or incurable diseases, when it shall be mentioned whether the therapeutic needs exceed this period). In the case of multiple coexisting diseases, the most serious disease shall be taken into account firstly. In the event of a convicted requesting deferral or interruption of penalty execution on the grounds of pregnancy, it is necessary to establish the pregnancy diagnosis with certainty and to specify the gestational age (clinically, by ultrasound, pregnancy tests).

Requests for carrying out forensic expertise have a considerable part to play in the current activity, particularly of the forensic institutions within whose competence area penitentiary institutions or units operate (including penitentiary hospitals). It is possible to assume that there are cases when the same person requested a new examination, invoking the same medical grounds or presenting a new category of accusations.

Even in these situations, the assessment must each time be complete and must lead, irrefutably, to the establishment of the diagnosis and consequently to the scientific justification of the recommendation for or against deferral/interruption of the penalty execution. In some cases, as a result of the research carried out within the framework of this work, delicate situations were revealed where patients with illnesses in terminal stage did not benefit from the recommendation of interruption of the penalty, deceasing before the completion of the forensic expertise.

One can iterate that, in the case of drafting a new Forensic Expertise Report (RNEML), this is drawn up only within INML "Mina Minovici", with the observance of the same conditions relating to the examination of the patient-convict, and the designated Commission is composed of other members than those who participated and expressed a point of view within the framework of the first expertise. The situations where it is possible to order the carrying out of a new forensic expertise are represented by the cases where elements which suggest a further deterioration in the evolution of the pathological disorders presented appear, or when new pathologies appear, and the patient has been already been the subject of a forensic expertise in this respect.

Access to required medical assistance for the duration of detention represents one of the sensitive points in relation to the observance of human rights, together with the other requirements concerning the conditions of detention. The ECHR is also involved in cases where it is petitioned by people who have or have had the quality of prisoners in Romanian penitentiaries, and these petitions represent a real problem (relating to image, but also from a financial point of view) for our country. Such an example is the case of I.S., who in 2005 submitted request number 35972/05 to the ECHR, which came to the attention of a Courtroom of Section III. [13]

The Applicant was held in the Romanian penitentiary system during 2002 to 2011 and the journey of the convict included no less than 37 penitentiary units and penitentiary hospitals.

The conditions of detention and the medical assistance were reported – the convict had not benefited from appropriate treatment for hepatitis and dental problems), but also the procedure for interruption of penalty execution (they submitted requests for forensic expertise regarding relating to their state of health, repeatedly, in accordance with the provisions of Articles 455 and 453 letter c of the CPP in force at that time).

The applications were recorded for the years 2004, 2006, and 2007 (all rejected in spite of the recommendations of the social services within the local authorities). On the basis of the evidence submitted, the ECtHR Court concluded that the overcrowding, lack of access to hygiene and inadequate treatment of health issues of the appellant had caused him a suffering that reached the level of treatment considered inhuman and degrading, and therefore Article 3 of the Convention had been infringed [13].

In this situation the existence of shortcomings was established in respect of the observance of the right to benefit from health care during the detention period, including elements relating to the question of access to the carrying out of the forensic expertise regarding the interruption of the penalty on medical grounds. The sanction applied, as damage to property and moral injury, amounted to 20,000 Euros (plus any sum by way of tax to this), plus the court fees (4,800 Euro).

4. Conclusions

After 2000 the number of deaths among prisoners decreased slightly, the mortality rates were reduced compared to those at the national level, a significant aspect for a progressive improvement of primary and specialized health care quality, granted in the prison.

Cardiovascular diseases and neoplastic tumours are the main causes of death among prisoners. Diagnosis and treating these categories of conditions require further efforts as well as early proposal of specific cases for forensic expertise in order to suspend/interrupt the execution of the sentence.

The cases when the prisoners have died before the requested expertise was completed confirm the existence of deficiencies in knowing their rights but also the need to streamline the process of carrying out the specific forensic expertise. There has been a clear tendency among prisoners to submit first request for the forensic expertise to interrupt sentence on medical grounds from the first year of incarceration.

The frequent situation of the cases in which the prisoners gave up to forensic expertise investigation requires the establishment of control mechanisms on the request sustainability.

Requests regarding sentence interruption on medical grounds and prisoner's behaviour multi-factorial determinism were identified in connection with forensic expertise carrying out.

Age (between 36 and 50 years), environment (urban) poor education and the number of years spent in detention (between 5 and 10 years) are directly involved factors in multi-factorial determinism of forensic expertise regarding sentence interruption on medical ground.

Numerous studies Delcea C, Enache A, Stanciu C, Siserman C, Gherman C, Fabian A. M, Radu C. C, Dumbravă D. P, Rus M, Matei H.V, Vică M. L. [14, 15, 16, 17, 18, 19, 20], confirm our results.

Authorized, accurate, competent and adapted to the current rate information is required to the prisoners' own rights typology, request conditions and purpose of carrying out the forensic expertise for the interruption of the sentence on medical grounds. Carrying-out inter-institutional procedures and indicating specialized examinations for the purpose of specifying the diagnosis can't be considered as causes of problems of delay and extension of the procedural activities regarding the forensic expertise for sentence interruption on medical ground, which doesn't exclude the necessity of future optimization approach.

Reducing or eliminating requests followed by giving up the performance of forensic expertise would certainly have a positive impact, by relieving the activity of the forensic commissions providing prisoners patients with real needs appropriate environments for the assurance and orientation of necessary resources (time, expenses for examinations and investigations).

The revealed aspects, related to the multiple factors that interfere in the cases in which forensic expertise regarding sentence interruption on medical grounds, require further exploration and follow-up through further investigations and studies, in order to reduce the incidence of these cases and to diminish negative implications on forensic activity.

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Evaluation of Personality Disorders and Aggressive Behaviour in the Medico-Legal Activity

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Abstract

The aggressive behaviour can acquire an adaptive or disruptive character. Such aggressive behaviour is common in forensic practice where almost every criminal action is committed with increased violence and the determination, quantification and circumstances of aggression should be mandatory. For these reasons, the evaluation of aggressive behaviour must be done taking into account several aspects: medical, psychological, social or educational. By using these items one can also quantify the implication of personality traits in the development of an aggressive behaviour.

Keywords: Aggression, Staxi-2, EPQ-R, Personality disorder

1. Introduction

Aggression is considered to be a human trait manifested under certain conditions, which can transform, in the absence of a relevant assessment, into a psychopathological problem. Based on the management and his manifestation, the aggressive behaviour can acquire an adaptive or disruptive character. It is known that aggression has a multifactorial aetiology and its occurrence cannot be attributed to a single phenomenon or deviation. Thus, it is necessary to study certain factors like maladaptation, mental slippage or deviant behaviours to prevent the occurrence of an aggressive phenomenon [1].

When it comes to the development of an aggressive behaviour, an important factor is a personality disorder. Certain disorders are distinguished by some intolerance to frustration, impulsivity, increased emotionality, social maladaptation or may even be caused by certain neuropsychic factors [2].

The evaluation of personality disorders can be done only by psychometric methods of identifying personality dimensions, using approved questionnaires or certain tools. Thus, in order to determine the personality of a person with an aggressive behaviour we can use the three-factor model of H.J. Eysenck. This theory says that there are 3 broad personality factors, namely neuroticism, extraversion-introversion and psychotic behaviour [3].

STAXI-2 inventory is another scale which is useful in the structured detection of anger response and anger control mechanisms and it can also be used to determine anger as a state or trait. It should also be noted that these assessments must be interpreted in a clinical context, regarding the existence or absence of an organic or psychiatric disorder [4].

The evaluation of aggressive behaviour is extremely important due to the diversity of the phenomenon as well as due to the possibilities of capitalizing on data about personality development, about controlling such behaviour in daily life with a focus on prevention, about correction and limit such deviant behaviour. At the same time, the evaluation of a cognitive and psychiatric disorder is necessary, to be able to make the correct connection between this manifest as a starting point of an aggressive behaviour [5].

Violence is common in forensic practice because most crimes are committed with increased impulsivity often going beyond the limits of the violence definition. Most of the time, aggressive behaviour means something violent, violence being a form of manifestation of aggression [6].

According to the latest studies, there are certain theories on aggressive behaviour that state that it has two aetiologies, namely one of a biological nature and one of a social nature.

Biological theories consider aggression to be an innate tendency to act. The psychoanalytic approach from Freud's point of view is based on two fundamental instincts, namely the instinct of life and the instinct of death. He mentions that under certain conditions these instincts determine behaviours that lead to the destruction of others, like aggressive behaviours. This theory of Freud is unifactorial in saying that aggression arises naturally from physiological tensions and must manifest itself in order for the individual to relax. At the same time, socio-biology highlights a biological basis of social behaviours. The basic principle of socio-biology is that aggression, altruism and other social behaviours have the function of facilitating the survival of the individual's genes. Aggression is adaptive because it helps the individual to live at least until the age of procreation, while facilitating access to resources, furthermore the health and reproductive capacity of the individual depend on this [7].

From a sociobiological point of view, aggressive behaviour has certain explanations that focus more on the learning process and on certain factors in the social context related to aggression. The theory that presents the connection between frustration and aggression is one of the most recognized and influential in the field. The principle of this theory is very simple, namely that any frustration leads to a way of aggression and any aggressive behaviour is based on a frustration or any aggressive behaviour can later lead to the development of frustration [7].

However, one must note that there are situations in which frustration does not lead to aggression or is not present as a constructive factor. It has been accepted that frustration creates a condition, a state of the individual who is prepared to act aggressively, but the actual manifestation of aggression or certain types of aggression in behaviours depends on specific conditions [1].

Thus, Berkowitz introduced a new intermediate element between aggression and frustration, namely environmental conditions. Frustration does not immediately evoke aggression, but generates in the individual a state of emotional arousal: anger. This in turn produces a state of readiness for aggressive behaviour. According to the same author, the aggressive act itself has two major sources: the state of arousal manifested by anger and situational cues [8].

Related to the implications of the social environment, the theory of social learning regarding aggressive behaviour was developed and explains the process by which behaviour or a sequence of behaviour is acquired. According to Bandura, who applied the theory of social learning, social behaviour is not innate but it is learned from appropriate models. The focus is on the individual's skills and learning experiences, which can be direct or indirect. For example, through socialization the child learns aggressive behaviour because he is directly rewarded or notices that others are even mentally rewarded for aggressive behaviour [9].

2. Personality Disorders with a Role in Determining Aggressive Behaviour

Personality disorders refer to those inflexible and maladaptive traits that cause either disturbance in the socio-professional functionality of the individual or subjective discomfort. Personality disorders are recognized from adolescence and persist throughout life, usually attenuating with age.

Recent data, suggests that approximately 10-13% of the general population has a personality disorder. More and more studies suggest that psychotherapy may be effective for some people with personality disorders. Acts of aggression and self-aggression are recorded in personality

disorders like dissocial personalities, borderline personalities and emotionally-unstable personalities. It also usually increases aggression in some organic personality disorders.

The environment and society conditions make their mark on people's personalities, they are influenced by the type of the family; serious illnesses of some family members; domestic violence, sexual abuse, abuse; the types of education or communication within the family.

Personality and implicitly personality disorders represent the background on which the tragedy of the psychic or somatic disease takes place and in this context its perception by the doctor or the clinical psychologist will suffer characteristic distortions [10].

Located on the border between normality and illness, without being able to define a status, personality disorders will sometimes be confused with mental illness, creating difficulties in diagnosis and approach. The purpose of recognizing personality disorder is to understand the patient's behaviours toward the disease, a classic example being addictive behaviours in which drug abuse cannot be treated without understanding the personality traits that accompany it [11]. In the same way there are some personality traits that lead to the development of aggressive behaviour:

Sadistic personality disorder – a sort of aggressive behaviour, with a ubiquitous pattern of cruelty, humiliation, which manifests itself from early adulthood and indicated by the appearance of at least four signs of them:

- used physical cruelty or violence in order to establish a dominant position in a relationship (not just to achieve a non-personal goal, such as hitting someone to rob them);
- humiliates or degrades people, in the presence of other people;
- treated someone very harshly or punished them in an unusually harsh way;
- is amused by, or enjoys observing, the physical or mental suffering of others (including animals);
- lied in order to cause pain or harm to others (not just to achieve another goal);
- makes other people act according to what he/she wants, scaring them (through intimidation or even terror);
- narrows the circle of people with whom he or she has a close relationship, for example, will not let his wife leave the house unaccompanied and will not allow his teenage daughter to participate in social events;
- is fascinated by violence, weapons, pain or torture.

Antisocial personality disorder – is characterized by contempt and violation of the others rights, criminal acts, sadistic, violent, irritability and aggression, traits that often manifest before the age of 15 years. It does not occur exclusively during schizophrenia or a manic episode. It is characterized by the inability to comply with social norms in connection with legal behaviour, indicated by the repeated commission of acts that constitute grounds for arrest; incorrectness, marked by lying repeatedly; impulsivity or inability to make plans; irritability and aggression, indicated by repeated fights and bodily attacks; negligence, recklessness for personal safety or the safety of others; lack of remorse.

Paranoid disorder – characterized by a distrust and pervasive suspicion of others, so that their intentions are interpreted as malicious, starting early in adulthood and present in a variety of contexts. It does not occur exclusively during schizophrenia or an affective disorder with psychotic elements. The person suspects without sufficient basis that others are exploiting, harming or deceiving him; wears a spade all the time, he is relentless against insults, insults or offenses; has recurring suspicions, without any justification regarding the fidelity of the spouse or sexual partner(s). This disorder is difficult to treat because patients are extremely suspicious of medical staff. Often, the treatment that helps relieve symptoms consists of medication and psychotherapy.

Borderline disorder – personality disorder in which there is an instability of interpersonal relationships, self-image and affection with marked impulsivity, starting early in adulthood. It does not include suicidal or self-harming behaviour. As a symptomatology it is characterized by desperate efforts to avoid real and imaginary abandonment; identity disorder; impulsivity in areas that are potentially self-harming (abusive sex, substance abuse, reckless driving, compulsive eating); recurrent gestures or threats of suicide or self-harming behaviour; affective instability and chronic feeling of emptiness. [12]

3. Testing Personality Disorders

Testing these behavioural disorders can be done by different methods, but accredited tests known, tested and approved, must always be used to obtain a correct result. The creation of instruments for measuring traits that are stable, have internal constancy and a high degree of intercultural validity, such as those offered by NEO-PI-R or EPQ-R provide a unique platform for research on the predictive validity of traits. The features are complemented by a growing range of validated state constructions, which could be investigated as dependent or mediating variables. One of these tests, as I said, developed by Eysenck, namely Eysenck Personality Questionnaire Revised (EPQ-R) assesses three personality factors, namely neuroticism, extraversion-introversion and psychotic behaviour with separate scales for impulsivity and lying. Thus, the subject who obtains a high score on the extraversion-introversion scale, as a person is considered sociable, longs for strong emotions, takes risks, loves pranks, is not always reliable and can sometimes go out of his mind. He characterizes the typical introvert as a person who is silent and withdrawn, he prefers books and not people, he is serious, he controls his emotions very well, he is reliable and he has high ethical standards. [13]

The person with a high score on the scale of neuroticism is a person who is prone to anxiety and depression, has bad blood, sleeps badly and has psychosomatic disorders, lets emotions affect his judgment and keeps thinking about things that could go wrong. Unlike the person who has a high score on the neuroticism scale, the one who got a low score on this scale recovers quickly after an experience that disturbs him emotionally and is generally calm and does not feel a grudge.

On the other hand, after this evaluation, the one who obtained a high score on the scale of psychoticism is characterized as lonely, often difficult, sometimes cruel, aggressive, sensitive, but with ordinary tastes. This dimension partially overlaps with concepts such as schizoid and antisocial personality disorders in the psychiatric domain. However, this test emphasizes that both neuroticism and psychoticism are normal personality traits even if they can predispose a very small number of people to neurotic and psychotic disorders [15]. Due to the obviously pejorative connotation of neuroticism and psychoticism, it was suggested that they be replaced with emotion and harshness in opposition, respectively with the control of the superego.

Studies show that personality traits can influence physical health. The image of the stressed, aggressive businessman suffering from a myocardial infarction is very common in our days. If personality traits are directly related to health, it follows that the measurement of personality traits must be done as accurately as possible in a medical setting. But establishing the true nature of the relationship between personality and health raises some issues, including how to measure is done, the difference between subjectively reported symptoms and objective signs of illness, and the kind of link between those two [2]. In addition, it is practically impossible to assess the part of the risk that belongs strictly to personality traits and the impact it would have in addition to that of poverty, entourage, education or working conditions. The best solution is to try to design studies and use statistical analyses appropriate to the study of complex interactions [5].

4. Anger Testing as an Element of Aggression

The manifestation, expression and control of anger as a predisposing factor of aggressive behaviour can be assessed by using the anger expression inventory as a state with STAXI-2 (State-Trait Anger Expression Inventory). This test was developed for two main reasons:

- To measure the components of anger, in order to facilitate detailed assessments of normal personality but also of psychological pathology.
- To provide a way to measure the contribution of the multiple components of anger to the evolution of health, targeting hypertension, coronary heart disease, cancer or other.

The feeling of anger as measured by STAXI is conceptually defined as having two major components – a state component and a trait component. In turn, the state of anger is defined as a state or emotional psychological condition, marked by subjective feelings that range in intensity from mild irritation or upset to intense anger. Anger, as a psychobiological emotional state, is generally accompanied by muscle tension and an arousal of the neuro-endocrine system and the central nervous system. Over time, the intensity of anger varies as a function of perceived injustice, attack, or mistreatment by others, or frustration resulting from obstacles to achieving a personal goal [15].

Anger as a personality trait is defined in terms of individual differences, as the willingness to perceive a large volume of situations as being annoying or frustrating, and by the tendency to respond to such situations with high levels of anger as a state. Individuals with a high level of anger as a personality trait experience more frequent and more intense states of anger than individuals who have a low level of this trait [16].

The expression of anger and its control are concepts defined as having four major components:

- External expression of anger, involves the expression of anger to other people or objects in the person's environment
- Inward expression of anger, consists of anger directed inwards (restraint or suppression of feelings of anger)
- External anger control is based on anger control by preventing the expression of anger to other people or objects in the environment.
- Internal control of anger refers to the control of anger suppressed by inducing a state of calm or relaxation when it occurs.

Thus, this way of assessing aggressive behaviour with an emphasis on anger consists of 57 items grouped on 6 scales, 5 subscales and an index of anger expression, which provides an aggregate measure of ways to express and control anger [4].

According to a study conducted in the United Kingdom on a number of 187 detainees who underwent psychiatric examination showed that the use of this STAXI 2 questionnaire was useful because it highlighted in addition to the degree of aggression, its type and data on impulse management in conjunction with medical pathology [17].

From a medico-legal point of view, a study carried out in 2016 within the Cluj Napoca Institute of Forensic Medicine revealed a total number of 1749 of cases, of which 1495 cases of aggression against living people, as well as 254 cases of deaths having violent mechanisms involved. Of these, a number of 174 cases of domestic violence were selected, of which 173 were cases of aggression against living persons and 1 case of death. Having this study as a benchmark, a rather high incidence of cases in which aggressive behaviour is involved can be observed, including at the interfamily level. At the same time, in these situations, an evaluation of the aggressor, by applying the batteries of tests mentioned above, could have highlighted a personality disorder or the application of a psychiatric examination could have highlighted a psychiatric pathology.

Personally, I consider it a loss to have such behaviours and not know how to evaluate them, how to follow them, how to prevent them and possibly how to treat them. Forensic practice is the most convenient environment where violence as a component of aggression stands out in both the legal and health fields. Thus we can make an assessment of this behaviour from a legal, juridical as well as from a medical, psychological or psychiatric point of view. [18]

5. Conclusions

The evaluation of aggressive behaviour must be done respecting several important aspects, medical, psychological, social or educational. From a conceptual point of view, personality disorders are directly related to the development of antisocial behaviour. Also, the testing of personality disorders should be done as rigorously as possible by using approved tools, preferably that can assess the impulsive nature or anger. One of the most used tests for testing anger is STAXI-2 which has proven that it can highlight certain behavioural states that lead to aggression by using four general axes.

I personally consider that the use of such questionnaires in forensic practice could lead to a broader perception of the person's character, to the establishment of a correct psychiatric or psychological diagnosis, to a protective prevention on the person himself and on those close to him.

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Ischemic Stroke Secondary to Carotid Artery Thrombosis Following Direct Penetrating Cervical Trauma

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Abstract

In this paper, we present the case of a subject that suffered a sharp force injury to the antero-lateral compartment of the neck, developing an unexpected ischemic cerebral infarction (stroke), with devastating short- and long-term consequences. The development of a stroke is a rare but dangerous complication of neck trauma. This kind of complication receives little attention, considering its rare frequency, but differentiating between a non-traumatic and a traumatic carotid artery thrombosis is very important in medico-legal settings, establishing a causal connection between a carotid artery thrombosis and a heteroagression trauma proving to be difficult in some cases.

Keywords: Stroke, carotid artery injury, carotid artery thrombosis, sharp force injury

1. Introduction

A stroke following neck trauma is a relatively rare entity [1], which can have devastating consequences, long term and short term, leading to numerous pathological neurological and psychiatric manifestations, or even death. As defined by WHO, a stroke represents a "rapidly developing clinical signs of a focal (or global) disturbance of cerebral function, with symptoms lasting 24 h or longer or leading to death, with no apparent cause other than of vascular origin" [2].

The mechanism of occurrence consists of cervical or cerebral arterial blood flow disruption, caused by medical pathology or traumatic damage of the carotidian, vertebral, or cerebral arteries. The blood flow disruption can be caused by arterial section, arterial wall dissection, arterial crushing, arterial wall thrombosis, or thrombi formation at the site of the trauma, which later become embolized in the cerebral circulation [3]. Arterial lesions without a tegumentary solution of continuity complicate with the formation of a haematoma, which can in turn create vascular compression, amplifying the ischemia in the interested territory [4].

Recognising the possibility of cervical vascular injury is very important in emergency medical practices, time being of grave importance in treating these injuries and their complications. Treatment ranges from medical (antiplatelet therapy, anticoagulants), to endovascular arterial stenting, or mechanical thrombectomy [5]. Cervical arterial trombi formation is most commonly attributed to pre-existing pathology, mainly atherosclerotic disease of the carotid and vertebral arteries [1]. In the rare cases where the cause is a traumatic one, it most commonly results from direct, penetrating or non-penetrating (blunt) neck trauma in the region of large cervical vessels; less frequently it is attributed to indirect head trauma. In such cases the autopsy results and available clinical information has to allow the forensic

pathologist to prove the existence of neck and/or head trauma and establish its causal connection with carotid or vertebral artery thrombosis and exclude other known, non-traumatic causes of the latter [6].

2. Case Presentation

A 41-year old male was found unresponsive at his home, with a penetrating latero-cervical stab/slash wound. He was brought to the ICU (intensive care unit), with a GSC (Glasgow Coma Scale) of 3, 105 BPM (beats per minute) heart rhythm, and a blood pressure of 130/100 mmHg.

He was known to suffer from Huntington's disease. Besides that, his medical history is unremarkable. He is admitted to the OR (operating room) 30 minutes after he was picked up by the ambulance, where he undergoes surgery for the suture of 2 superficial arteries, and the evacuation of a compressing neck hematoma. No major cervical blood vessels were directly hit by the blade. We examined the patient one day later after the surgery, and we identified a left latero-cervical transverse, partially sutured, patched, stab/slash wound, with a length of 3 centimeters and a width of 0.2 centimeters (Fig. 1).

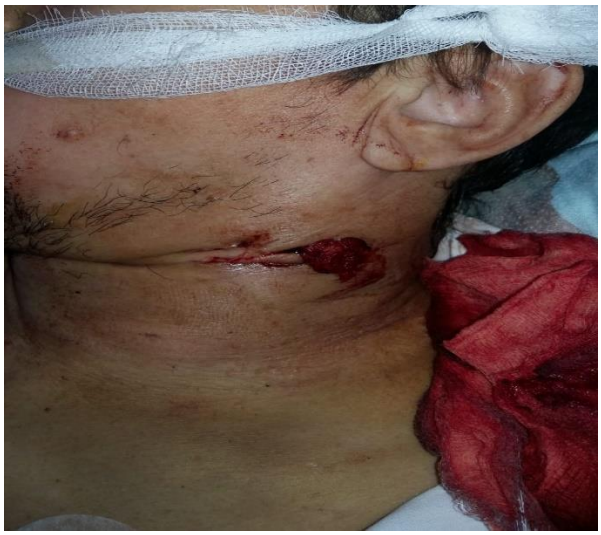

Fig. 1. Left latero-cervical transverse, partially sutured, patched, stab/slash wound

He is admitted in the same day at the neurology section of the hospital, where he undergoes an ACT (Angiography Computer Tomography) scan after the admission. The head ACT scan revealed a subacute ischemic stroke in the territory of the middle cerebral artery. The neck ACT scan revealed a left carotidian region haematoma, a tight stenosis of the internal jugular vein, thrombosis associated with the occlusion of the common and internal left carotid artery, and atheroma plaques located at the intracavernous and supracavernous segments of both internal carotid arteries.

He was treated with antiplatelet therapy during the hospital stay, with the recommendation to continue the treatment at home. He is released from the hospital 24 days later, with aphasia, right hemiplegia, right Babinski reflex, and muscular power deficiency of the left arm and leg.

The patient died 4 months later, at his home, the cause of death being ruled as mechanical asphyxia, following the aspiration of gastric content in the airways.

The macroscopic findings at the autopsy were as follows: a 2.5/0,1-0,2 stab/slash wound of the left anterolateral cervical region (Fig. 2), brain oedema with a low consistency, brittle, yellowish lesion of the parieto-tempero-occipital region, consistent with an old stroke (Fig. 3); a 9 cm thrombus adhering to the left common carotid artery, obstructing 90% of the carotidian lumen on a distance of 3 cm (Fig. 4); the trachea had an important quantity of a substance with

the same aspect as the gastric content in its lumen; the lungs were inflated, emphysematous, congested with small raised reddish zones, multiple asphyxical petechiae on the dorsal, basal, and scisural regions, and with the emergence of a substance with the same aspect as the gastric content from the pulmonary bronchi on lung sections (Fig. 5).

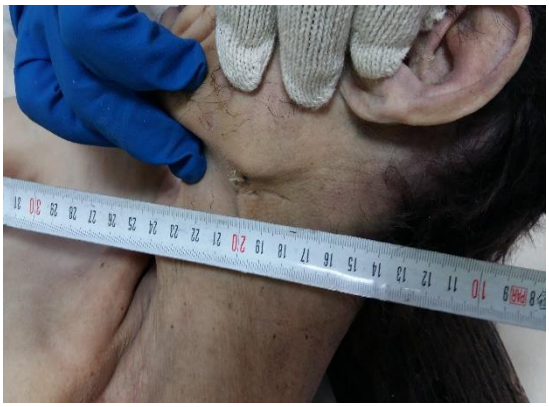

Fig. 2. Sab/slash wound of the left anterolateral cervical region

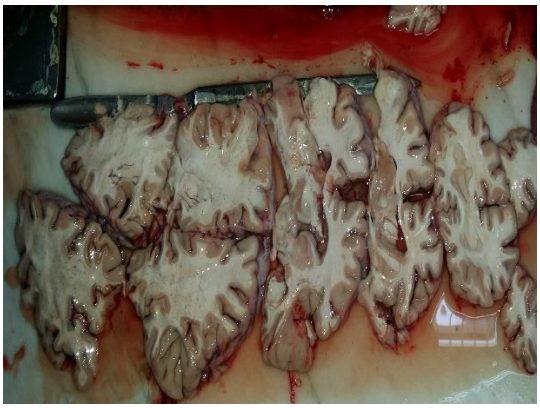

Fig. 3. Drain oedema

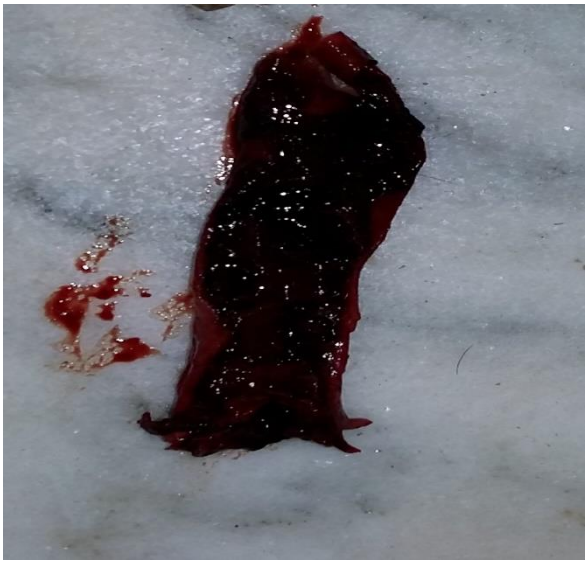

Fig. 4. Thrombus adhering to the left common carotid artery

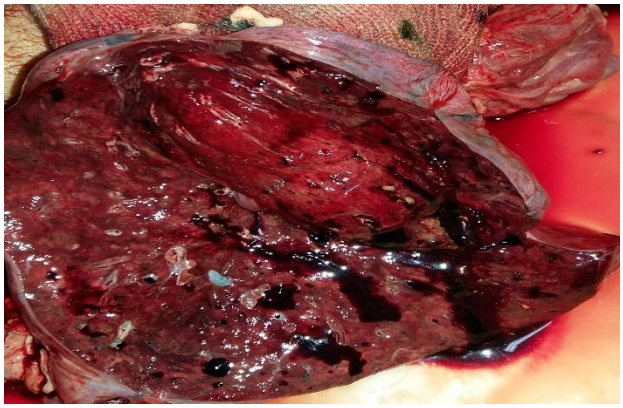

Fig. 5. Lung section

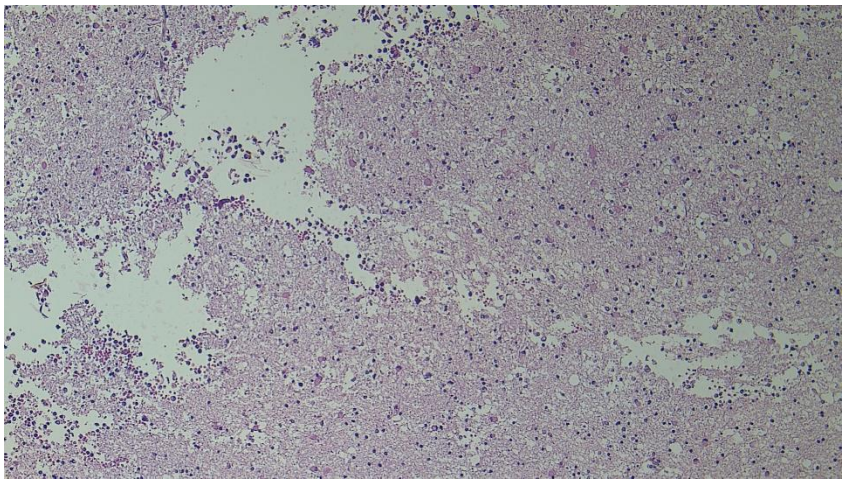

Fig. 6. Brain vascular congestion, oedema, tissue necrosis, and encephalomalacia HE x4

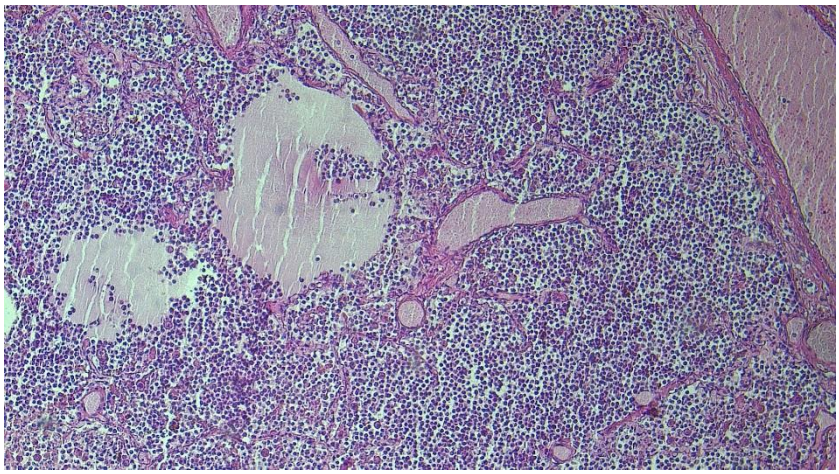

Fig. 7. Lung fibrosis, acute inflammatory cells infiltrate, and acellular alimentary content present in the bronchi – Accuscope 4, HE x10

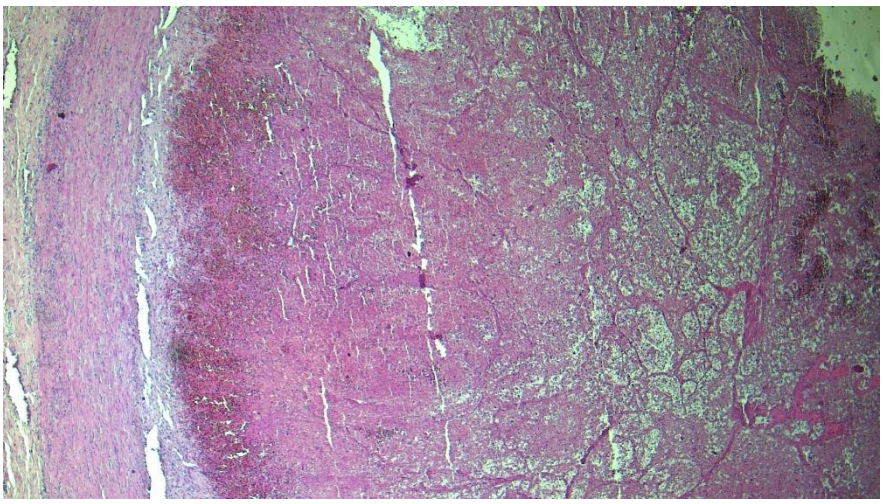

Fig. 8. Carotidian thrombosis – Accuscope, HE x4

The microscopic anatomopathological examination revealed the following: brain vascular congestion, oedema, tissue necrosis, and encephalomalacia (Fig. 6); lung fibrosis, acute inflammatory cells infiltrate, and acellular alimentary content present in the bronchi (Fig. 7); carotidian thrombosis with an 80% lumen obstruction and descreet carotidian atheroscletic deposits (Fig. 8).

3. Discussion

A stroke or cerebrovascular accident (CVA) is an acute compromise of the cerebral perfusion or vasculature. Approximately 85% of strokes are ischemic and the rest are haemorrhagic. [7]

Ischemic etiologies can be divided into embolic, thrombotic, and lacunar. In general, the common risk factors for stroke include hypertension, diabetes, smoking, obesity, atrial fibrillation, and drug use. Of all the risk factors, hypertension is the most common modifiable risk factor for stroke. [7] [8]

While cerebral vascular lessions are of non-traumatic ethiology in most of the cases, they can also be of traumatic origin, associated with neck and head trauma, when the cervical or cerebral arteries are involved, with arterial wall damage or thrombus formation. The traumatic and non-traumatic etiologies can also be concurring, when there is a pathological pre-existing damage to the arterial wall, from instable atherosclerotic plaques, that enlarges during the trauma, which promotes thrombi formation.

In this case, considering the timeline of the events, the topography of the lesion and the patients past medical history, we concluded that the left common and internal carotid artery thrombus can be attributed to the trauma suffered by the patient, even thought he had a low number of discreet bilateral carotidian atheroscletic deposits.

The mechanism which was most likely involved in the thrombus formation was the production of intimal wall micro-fissures of the carotid artery, which were, in our opinion, created by the transmission of the mechanical force through the soft tissue, generated by the slash/stab wound. The intimal tears were not possible for us to objectify, given the long amount of time spent from initial injury to the patient's death, and subsequent necropsy.

4. Conclusions

Making a causal connection between a carotid artery injury, complicated by numerous neurological consequences, with direct or indirect cervical trauma proves to be a difficult task.

The first step in making a connection between a carotid thrombosis and trauma is reviewing and eliminating non-traumatic etiologies, which are the leading cause of carotid artery injury.

All information available must be used, including patient's medical history. In some cases, making a causal connection between a traumatic and non-traumatic carotidian trombi formation proves to be a difficult or even an impossible task, in the presence of past carotidian atherosclerotic pathology.

Differentiation of traumatic and non-traumatic carotid artery thrombosis is a very important forensic task, taking into consideration that this kind of trauma is of heteroagression origin in a high number of cases, highlighting that bringing the criminal offender to justice in of utmost importance.

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Quality of Life and Emotional Distress of Teachers During the COVID-19 Pandemic. Comparative Study Romania-Brazil

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Abstract

This paper presents the aspects of the relationship between the quality of life and emotional distress of teachers during the COVID-19 pandemic, knowing that isolation can qualitatively affect emotional stability and the quality of life. The study was conducted on 100 teachers, 50 of them from Romania and 50 from Brazil, of which 50 are female and 50 are male. Two instruments were used to measure the variables: Quality of Life Inventory, which contains 16 areas of quality of life, and the Emotional Distress Profile (both from the Cognitrom Assessment System). The results obtained showed that there are significant differences in the level of emotional distress depending on nationality, in the sense that teachers in Brazil have a higher level of emotional distress than teachers in Romania, facing more complex tasks.

Significant differences were also noticed, in terms of affected areas of life by gender, in the sense that men feel distressed in different areas of activity compared to women.

Keywords: self-esteem quality of life, emotional distress, didactic staff

1. Introduction

Quality of life research has significant implications for social and public policy, as it can be used to assess the "human effectiveness" of health system restructuring. When epidemiological and quality of life data lead to national health care planning, improved approaches to health service management may become apparent. Finally, only the patient or consumer can determine if a particular treatment is successful; the same may apply to the health care reform [1]. The level of population quality of life and health depends largely on the determinants related to professional activity. The results of the meta-analyses indicate a significant importance between increasing employment conditions for quality of life and the health of the population in most countries of the world, especially those with a market economy [2]. Quality of life is an increasingly common theme in the literature related to health promotion. Several approaches that take into account quality of life and health are analysed. These are (a) health-related quality of life; (b) quality of life as a social diagnosis in health promotion; (c) quality of life among people with developmental disabilities; (d) quality of life as social indicators; each approach is considered to focus on objective or subjective indicators [3].

2. Quality of Life, Self-Esteem and Emotional Distress

The concept of quality of life was defined as "the totality of economic, social, ecological, spiritual conditions, etc., which ensures the integrity and balance of biological life, the continuous and sustainable development of the human personality" [4]. Most researchers consider living standards, living environment, natural environment, social and political environment as the 4 essential components of quality of life.

Of these, the standard of living, considered to be the main component, represents the degree of satisfaction of the direct needs, directly felt by the individual. "The basis of ensuring the standard of living corresponding to the requirements of contemporary social development is the degree of economic development, the level and evolution of the domestic product and its distribution policy, the policy of ensuring the income of the population for consumption, income necessary to cover public expenditures for education, health , culture, public order, etc.)" [5].

The implicit theory of life satisfaction assumes that the evaluation of life is done continuously, and the research results are projected on a symmetrical scale. In fact, only the extreme elements are taken into account – satisfied and dissatisfied. Viewed in a simplistic way, satisfaction with life can be appreciated as an attitude [6], starting from the idea that attitudes include at least two elements – cognition and affection.

The field of quality of life can be defined by all the elements that refer to the physical, economic, social, cultural, political, health, etc., in which people live, the content and nature of the activities they carry out, the characteristics of relationships and social processes participate in the goods and services they have access to, the consumption patterns adopted, the way and lifestyle, the evaluation of the circumstances and results of activities that correspond to the population's expectations, as well as the subjective states of satisfaction/dissatisfaction, happiness, frustration, etc. [7].

In 1890, the term "self-esteem" was first used by William James in *Principles of Psychology*: "Self-esteem is of two kinds: self-satisfaction and dissatisfaction". Recent studies have found that temporal variability and reactivity of self-esteem (SE) are associated with the risk for post-life stress depressive symptoms [8].

There are three general definitions of self-esteem, often accepted and used. The first of these is the individual's ability to succeed in the significant aspects of life and to believe in their own aspirations. The second consists in an attitude that raises the sense of value [9]. The third belongs to Branden (1992) and is a combination of the first two definitions: "Confidence in our ability to think and cope with life's challenges. Confidence in our right to be happy, the feeling of being worthy, deserved, entitled to affirm our needs and desires and to enjoy the fruits of our efforts [10].

One area often addressed by researchers in this field is the way in which the self-patterns and self-concepts of individuals with high self-esteem differ from those of individuals with low self-esteem [11].

- Positivism: a number of studies have shown that people with high self-esteem tend to value their positive traits higher and devalue negative traits compared to those with low self-esteem. This does not necessarily mean that people with low self-esteem have completely negative opinions about themselves, but are only less positive. Some studies have suggested that those with high self-esteem have more positive attributes and outcomes than those with low self-esteem [11].
- Certainty: people with high self-esteem have much clearer and more focused concepts about themselves, well-articulated, with an internal consistency. They have confidence in their own positive attributes, compared to people with low self-esteem, who tend to show uncertainty and insecurity, both in terms of positive attributes and negative ones.
- Importance: both people with low self-esteem and those with high self-esteem believe that it is important to have positive attributes. However, those with high self-esteem tend to devalue the negative attributes they possess and the positive attributes they do not possess, while people with low self-esteem do not tend to devalue their own negative characteristics or positive attributes they do not possess.

- Prospects for the future: those with high self-esteem have positive and optimistic expectations regarding their future effort and results, as opposed to people with low self-esteem who view their contribution negatively in the future [11].

Mental health, an important aspect of research in psychology, can be determined by the relationship between psychological well-being and psychological stress. Mental health is rooted in the concept of "quality of life", which is the general state of well-being in the workplace that can be measured in terms of quality indicators, which can be assessed by various indicators, such as high psychological well-being, psychological distress, low, high organizational commitment and high work-life balance [12]. A teaching career viewed with confidence as a safe work environment and social positioning, with satisfying and autonomous work opportunities, is changing drastically nowadays.

The main components of psychological well-being are the feeling of self-realization, self-esteem and the feeling of balance. Moreover, Massé *et al*., demonstrated that psychological well-being and psychological stress are different but complementary states of mental health [13]. Veit and Ware pointed out that mental health has two sides: psychological stress and psychological well-being. Anger or irritability, anxiety and exhaustion are typical states of psychological suffering, as well as the tendency to devalue and the tendency to isolate, to stay away, not to engage in activities with others [14].

The term 'distress' is frequently used in nursing literature to describe patient discomfort related to signs and symptoms of acute or chronic illness, pre- or post-treatment anxiety or compromised status of foetuses or the respiratory system. 'Psychological distress' may more accurately describe the patient condition to which nurses respond than does the term 'distress'.

Psychological distress is seldom defined as a distinct concept and is often embedded in the context of strain, stress and distress [15].

Some of the psychological and emotional signs that you are stressed out include:

- Depression or anxiety.
- Anger, irritability, or restlessness.
- Feeling overwhelmed, unmotivated, or unfocused.
- Trouble sleeping or sleeping too much.
- Racing thoughts or constant worry.
- Problems with your memory or concentration.
- Making bad decisions.

3. Methodology

3.1 Objectives

The general objective of the study is to identify the quality of life and emotional distress in teachers.

3.2 Hypotheses

1. It is assumed that there are significant differences in emotional distress depending on nationality.
2. It is presumed that there are significant differences in terms of quality of life depending on nationality.
3. It is assumed that there is a correlation between emotional distress and areas of quality of life in teachers.
4. It is assumed that there is a correlation between emotional distress and areas of quality of life depending on nationality.
5. It is assumed that there is a correlation between emotional distress and areas of quality of life depending on gender.

6. It is assumed that there is a correlation between emotional distress and areas of quality of life depending on age.

3.3 Study participants and research tools

To carry out this study, two tools were applied: Quality of Life Inventory, which contains 16 areas of quality of life (health, self-esteem, goals and values, money, work, play, learning, creativity, help, love, friends, children, relatives, home, neighbourhood and community) (CASS Cognitrom) and the Emotional Distress Profile (CASS Cognitrom). The questionnaires were applied online and the selection of respondents was made by non-probabilistic methods, arbitrarily (convenience sample – people who volunteered to participate in this study by completing the questionnaires), using the snow ball method (selection in the chain – respondents offered the names of other respondents who are part of the population of interest) as well as the method of quotas that imposed the classification of elections in certain quotas (indicating the frequencies of individuals with certain characteristics).

Thus, the study counted 100 teachers, 50 of them from Romania and 50 from Brazil. Of these, 50 are female and 50 are male (Table 3.1).

Table 3.1 Distribution according to gender and nationality

	Romania	Brazil	Total
Female	25	25	50
Male	25	25	50

The average age of the participants is 44.64 years, the median is 43, which means that half of the participants are between 20 and 43 years old and the other half are between 43 and 79 years old, most of the respondents aged 43 years (Table 3.2).

Table 3.2 Statistical start indicators

mean	44,64
median	43,00
mode	43
minimum	20
maximum	79

3.4 Data analysis and processing

Verification of hypothesis 1: It is assumed that there are significant differences in terms of emotional distress depending on nationality.

Table 3.3 Standard functional emotions * Country Cross tabulation

		Country		
		Romania	Brazil	Total
standard functional emotions	Very low level of distress	5	3	8
	Low level of distress	11	5	16
	Average level of distress	13	5	18
	High level of distress	14	24	38
	Very high level of distress	7	13	20
Total		50	50	100

In the association table (Table 3.3) is observed the distribution of the answer's frequencies according to nationality, as follows:

- 8 people obtained a very low level of emotional distress (5 Romanians, 3 Brazilians);
- 16 people obtained a low level of emotional distress (11 Romanians, 5 Brazilians);

- 18 people obtained an average level of emotional distress (13 Romanians, 5 Brazilians);
- 38 people obtained an increased level of emotional distress (14 Romanians, 24 Brazilians);
- 20 people obtained a very high level of emotional distress (7 Romanians, 13 Brazilians).

People who have obtained a high and very high level of emotional distress are characterized by negative thinking, behaviour related to cognition, the person developing negative emotions resulting from the degree of discomfort experienced.

Table 3.4 Chi-Square Tests distress emotional-nationality

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.737[a]	4	.030
Likelihood Ratio	10.985	4	.027
Linear-by-Linear Association	6.999	1	.008
N of Valid Cases	100		

a. 2 cells (20.0%) have expected countless than 5. The minimum expected count is 4.00.
a. 0 cells (.0%) have expected countless than 5. The minimum expected count is 5.00.

Performing the Chi-square test (table 3.4) to analyse the differences between the frequencies of the samples, we find that there are significant differences in terms of emotional distress in Romanians and Brazilians, in the sense that Romanians have a lower level of emotional distress than Brazilians. Hypothesis 1 is confirmed.

Verification of hypothesis 2. It is presumed that there are significant differences in terms of quality of life depending on nationality

Table 3.5 Etalon * Country Cross tabulation – life quality

		Country		
		Romania	Brazil	Total
etalon	Very low level	2	6	8
	Low level	8	11	19
	Medium level	23	21	44
	High level	17	12	29
Total		50	50	100

Performing an analysis of the frequencies of the answers of the respondents of the entire sample (Table 3.5), one can discover that:

- the majority obtained an average level of quality of life, 44 respondents, of which 23 respondents were from Brazil and 21 respondents from Romania. People who have achieved this level have a good functioning in terms of valued areas of life, being generally satisfied, happy and fulfilled. Most of the time, they have access to get what they want from life and are able to meet their basic needs and meet their goals in most areas of life (not all). They have one or more of the psychosocial resources available to those with high scores, which is why people with poor quality of life tend to experience life situations and interpersonal relationships that can bring them satisfaction. The individuals in question also have the ability to solve the problems they face without exaggerating them and are able to assert themselves and achieve their own goals. They perceive the world in a favourable light, without the negative distortion of life situations. These individuals have a balanced life and get satisfaction from several areas of life, avoiding focusing on one or two areas that would make them vulnerable to the first problems related to satisfaction with those areas. They are not very stressed (in the sense that they do not suffer from depression, anxiety or excessive nervousness and are more satisfied than frustrated with their own life).

- 29 respondents obtained a high level of quality of life (12 respondents from Brazil, 17 respondents from Romania. These people are characterized by being happy and fulfilled, they are successful in getting what they want from life, they are able to meet basic needs and achieve their goals, have a high degree of resistance to stress, are strong socially, psychologically and environmentally, and enjoy positive interpersonal relationships.
- 19 respondents (11 respondents from Brazil and 8 respondents from Romania) obtained a low level of quality of life. People in this category are usually unhappy and unfulfilled people and are sometimes unable to get what they want out of life, to meet their basic needs and to achieve their goals set in later areas of life. However, they manage to achieve their satisfaction in several areas of life.
- 8 respondents (6 respondents from Brazil and 2 respondents from Romania) have a very low level of quality of life. These people are very unhappy and unfulfilled, often unsuccessful in trying to get what they want most out of life. They tend to feel frustrated and vulnerable to negative feelings but also prone to psychological and health conditions. The performance and job satisfaction of these individuals is very low.

Table 3.6 Chi-Square Tests Life quality-nationality

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.262[a]	3	.007
Likelihood Ratio	13.252	3	.004
Linear-by-Linear Association	4.488	1	.034
N of Valid Cases	100		

a. 0 cells (.0%) have expected countless than 5. The minimum expected count is 5.00

Performing the Chi-square test to analyse the differences between sample frequencies, we find that there are significant differences in the quality of life of Romanians and Brazilians, in the sense that Romanians have a higher quality of life than Brazilians (Table 3.6). Hypothesis 2 is confirmed.

Verification of hypothesis 3. It is assumed that here is a correlation between emotional distress and areas of quality of life in teachers.

Table 3.7 Correlations

		Total Distress	Gross Life Score
Total Distress	Pearson Correlation	1	-.386**
	Sig. (2-tailed)		.000
	N	100	100
Gross Life Score	Pearson Correlation	-.386**	1
	Sig. (2-tailed)	.000	
	N	100	100

***. Correlation is significant at the 0.01 level (2-tailed).*

Regarding emotional distress and quality of life, the statistical analysis between these two variables highlighted the existence of a negative correlation: the higher the level of emotional distress, the lower the quality of life of the individual (Table 3.7).

Table 3.8 Correlations

		Health	Self Esteem	Goals and Values	Money	Work	Game	Learning
Emotional Distress	Pearson Correlation	**-.326****	**-.265****	**-.211***	**-.280****	**-.333****	**-.276****	-.003
	Sig. (2-tailed)	.001	.008	.035	.005	.001	.006	.977
	N	100	100	100	100	100	100	100

***. Correlation is significant at the 0.01 level (2-tailed).*

**. Correlation is significant at the 0.05 level (2-tailed).*

Table 3.9 Correlations

		Creativity	Help	Love	Friends	Children	Relatives	Home	Com-m unity	Neighbour-hood
Emotional Distress	Pearson Correlation	**-.255***	-.158	-.159	**-.286****	-.094	-.170	-.140	**-.318****	-.191
	Sig. (2-tailed)	.011	.115	.113	.004	.351	.091	.164	.001	.057
	N	100	100	100	100	100	100	100	100	100

Tables 3.8 and 3.9 present the correlations between emotional distress and areas of quality of life in teachers for all study participants and the following results were obtained:

- Negative correlation between emotional distress and health - the more the emotional distress is accentuated, the more the individual's health condition is deteriorated;
- Negative correlation between emotional distress and self-esteem – the greater the emotional distress, the lower the individual's self-esteem;
- Negative correlation between emotional distress and goals and values – Negative correlation between emotional distress and work – the greater the emotional distress the lower the individual's satisfaction with work, with repercussions on oneself, on the relationship with colleagues, with bosses as well as on safety at work;
- Negative correlation between emotional distress and play – the more severe the emotional distress, the lower the individual's tendency to allocate free time for relaxation or hobbies;
- Negative correlation between emotional distress and learning – the more severe the emotional distress, the less time and resources the individual allocates to acquire new skills or information;
- Negative correlation between emotional distress and creativity – the more emotional the distress, the more the individual accesses the cognitive resources to solve some daily problems that he or she faces, using less imagination to practice hobbies;
- Negative correlation between emotional distress and friends – the more the emotional distress is accentuated the more withdrawn the individual is, socializes less and has low social interactions;
- Negative correlation between emotional distress and community – the more emotional distress is the more the individual allocates less cognitive resources for the community in which he lives (he or she is less interested in the region where he lives). Hypothesis 3 is confirmed.

Verification of hypothesis 4. It is assumed that there is a correlation between emotional distress and areas of quality of life depending on nationality.

Tables 3.10 and 3.11 show the correlations between emotional distress and quality of life areas by nationality.

Table 3.10 Correlations Romania

		Health	Self Esteem	Goals and Values	Money	Work	Game	Learning
Emotional Distress	Pearson Correlation	-.267	-.169	**-.305***	**-.316***	**-.347***	-.243	.182
	Sig. (2-tailed)	.061	.241	.031	.025	.014	.089	.206
	N	50	50	50	50	50	50	50

**. Correlation is significant at the 0.05 level (2-tailed).*
***. Correlation is significant at the 0.01 level (2-tailed).*

Table 3.11 Correlations Romania

		Creativity	Help	Love	Friends	Children	Relatives	Home	Community	Neighbour-hood
Emotional Distress	Pearson Correlation	-.247	-.025	.031	-.254	-.133	-.160	-.053	**-.374****	**-.296***
	Sig. (2-tailed)	.084	.862	.831	.076	.356	.267	.715	.008	.037
	N	50	50	50	50	50	50	50	50	50

From the point of view of nationality, we observe (tables 3.10, 3.11) that Romanians obtained negative correlations between emotional distress and the following areas of quality of life: goals and values, money, work, community (neighbours) and neighbourhood.

Table 3.12 Correlations Brasilia

		Health	Self Esteem	Goals and Values	Money	Work	Game	Learning
Emotional distress	Pearson Correlation	**-.375****	**-.332***	-.149	-.253	**-.318***	**-.307***	-.194
	Sig. (2-tailed)	.007	.018	.300	.076	.024	.030	.177
	N	50	50	50	50	50	50	50

Table 3.13 Correlations Brasilia

		Creativity	Help	Love	Friends	Children	Relatives	Home	Community	Neighbour-hood
Emotional distress	Pearson Correlation	-.263	**-.310***	**-.333***	**-.316***	-.055	-.248	-.236	-.258	-.107
	Sig. (2-tailed)	.065	.028	.018	.026	.706	.082	.099	.071	.460
	N	50	50	50	50	50	50	50	50	50

**. Correlation is significant at the 0.05 level (2-tailed).*
***. Correlation is significant at the 0.01 level (2-tailed).*

Unlike the Romanians, the Brazilians obtained significant negative correlations between health, self-esteem, play, help, love and friends (Table 3. 12, 3.13). Hypothesis 4 is confirmed.

Verification of hypothesis 5. It is assumed that there is a correlation between emotional distress and areas of quality of life depending on gender.

Tables 3.14 and 3.15 show the correlations between emotional distress and areas of quality of life by gender.

Table 3.14 Correlations gender female

		Health	Self Esteem	Goals and Values	Money	Work	Game	Learning
Emotional distress	Pearson Correlation	**-.522****	**-.429****	-.255	**-.405****	**-.314***	-.307*	-.159
	Sig. (2-tailed)	.000	.002	.074	.004	.026	.030	.270
	N	50	50	50	50	50	50	50

***. Correlation is significant at the 0.01 level (2-tailed).*
**. Correlation is significant at the 0.05 level (2-tailed).*

Table 3.15 Correlations gender female

		Creativity	Help	Love	Friends	Children	Relatives	Home	Community	Neighbour-hood
Emotional Distress	Pearson Correlation	**-.313***	**-.346***	**-.405****	**-.446****	-.111	-.222	-.064	-.238	-.198
	Sig. (2-tailed)	.027	.014	.004	.001	.441	.121	.660	.096	.168
	N	50	50	50	50	50	50	50	50	50

**. Correlation is significant at the 0.05 level (2-tailed).*
***. Correlation is significant at the 0.01 level (2-tailed).*

Among women (for the entire sample), statistically significant negative correlations were obtained between emotional distress and the following areas of quality of life: health (-.522 **), self-esteem (-.429 **), money (-.405 **), work (-.314 *), creativity (-.313 *), help (-.346 *), love (-.405 **) and friends (-.446 **) (Table 3.14, 3.15).

Table 3.16 Correlations gender male

		Health	Self Esteem	Goals and Values	Money	Work	Game	Learning
Emotional distress	Pearson Correlation	-.183	-.110	-.171	-.189	**-.357***	-.256	.112
	Sig. (2-tailed)	.204	.449	.235	.188	.011	.073	.439
	N	50	50	50	50	50	50	50

**. Correlation is significant at the 0.05 level (2-tailed).*
***. Correlation is significant at the 0.01 level (2-tailed).*

Table 3.17 Correlations gender male

		Creativity	Help	Love	Friends	Children	Relatives	Home	Community	Neighbour-hood
Emotional Distress	Pearson Correlation	-.209	.004	.159	-.134	-.079	-.119	-.223	**-.382****	-.186
	Sig. (2-tailed)	.145	.979	.269	.352	.584	.411	.119	.006	.197
	N	50	50	50	50	50	50	50	50	50

***. Correlation is significant at the 0.01 level (2-tailed).*
**. Correlation is significant at the 0.05 level (2-tailed).*

Unlike women, men obtained statistically significant negative correlations between emotional distress and the following areas of quality of life: work (-.357*) and community (-.382**). Hypothesis 5 is confirmed.

Verification of hypothesis 6: It is assumed that there is a correlation between emotional distress and areas of quality of life depending on age.

Table 3.18 Correlation Age – up to 40 years

		Health	Self Esteem	Goals and Values	Money	Work	Game	Learning
Emotional distress	Pearson Correlation	**-.500****	-.214	-.202	**-.417****	**-.488****	-.261	.090
	Sig. (2-tailed)	.001	.185	.212	.007	.001	.103	.581
	N	40	40	40	40	40	40	40

***. Correlation is significant at the 0.01 level (2-tailed).*
**. Correlation is significant at the 0.05 level (2-tailed).*

Table 3.19 Correlations Age – up to 40 years

		Creativity	Help	Love	Friends	Children	Relatives	Home	Community	Neighbour-hood
Emotional distress	Pearson Correlation	-.290	.087	-.120	-.252	-.055	.101	-.067	-.310	-.069
	Sig. (2-tailed)	.069	.595	.462	.116	.734	.536	.680	.052	.672
	N	40	40	40	40	40	40	40	40	40

**. Correlation is significant at the 0.05 level (2-tailed).*
***. Correlation is significant at the 0.01 level (2-tailed).*

Regarding the age variable, among people up to 40 years old, statistically significant negative correlations were obtained between emotional distress and the following areas of quality of life: health (-.500**), money (-.417**), work (-.488**). Among people in this age category, the more severe the emotional distress, the more affected is the state of health, correlated with work and remuneration. (Tables 3.18, 3.19).

Table 3.20. Correlations Age – over 40 years

		Health	Self Esteem	Goals and Values	Money	Work	Game	Learning
Emotional distress	Pearson Correlation	**-.269***	**-.325***	-.252	-.138	-.171	**-.359****	-.071
	Sig. (2-tailed)	.037	.011	.052	.294	.192	.005	.591
	N	60	60	60	60	60	60	60

**. Correlation is significant at the 0.05 level (2-tailed).*
***. Correlation is significant at the 0.01 level (2-tailed).*

Table 3.21. Correlations Age - over 40 years

		Creativity	Help	Love	Friends	Children	Relatives	Home	Community	Neighbour-hood
Emotional distress	Pearson Correlation	-.224	**-.330****	-.233	**-.336****	-.133	**-.279***	-.240	**-.364****	**-.317***
	Sig. (2-tailed)	.085	.010	.073	.009	.310	.031	.064	.004	.014
	N	60	60	60	60	60	60	60	60	60

***. Correlation is significant at the 0.01 level (2-tailed).*
**. Correlation is significant at the 0.05 level (2-tailed).*

Among people over the age of 40, statistically significant negative correlations were obtained between emotional distress and the following areas of quality of life: health (-.269*), self-esteem (-.325*), play (-.359**), relatives (-.279), community (-.364**) and neighbourhood (-.317). Among people in this age category, the more severe the emotional distress, the more affected are health, self-esteem, allocation of free time for recreational activities, the relationship with relatives, friends, give less importance to the neighbourhood and the community where live (Table 3.20, 3.21). Hypothesis 6 is confirmed.

4. Conclusions and Discussions

Of the six hypotheses subject to verification, all were confirmed by the methodological approach. Thus, from the verification of the first hypothesis we find that there are significant differences in terms of emotional distress among Romanians and Brazilians, in the sense that Romanians have a lower level of emotional distress than Brazilians, which means that in the education system Brazilian teachers can meet with much more complex tasks than in the Romanian education system which does not allow easy performance of all tasks during the pandemic, this affecting certain levels of professional life, which serves to obtain a higher score on the overall score on quality of life, for Romanians compared to Brazilians. Regarding the relationship between emotional distress and quality of life, the statistical analysis highlighted the existence of a negative correlation, in the sense that the more emotional distress is accentuated the more the quality of life is affected, the person not identifying effective coping strategies, coping with the stress generated by isolation during the pandemic. Regarding the affected areas of life, it is observed that Romanian teachers obtained significantly negative correlations between emotional distress and the following areas of quality of life: goals and values, work, unlike Romanians, Brazilians also obtained significant negative correlations between health, self-esteem, play, help, love and friends. In terms of gender differences, female teachers scored significantly r emotional distress and the following areas of quality of life: health (r= -.522**), self-esteem (r = -.429**), money (r = -.405**), work (r = -.314*), creativity (r = -.313*), help (r = -.346*), love (r = -.405**) and friends (r = -.446**), while male teachers achieved a significant r between emotional distress and the following areas of quality of life: work (-.357*) and community (-.382**). If among men, emotional distress through the appearance of negative emotions influences only their cognitions regarding the community in which they live and the work they carry out, among women, the appearance of irrational cognitions and negative emotions also affects health, self-esteem, creativity, help, love and friends. Hence, men have greater mental resilience than women.

Numerous studies Delcea C, Enache A, Stanciu C, [16], Delcea C, Enache A, Siserman C. [17], Gherman C, Enache A, Delcea C. [18], Delcea, C., Fabian, A. M., Radu, C. C, Dumbravă D. P. [19], Rus, M., Delcea, C., Siserman C., [20], Siserman, C., Delcea, C., Matei, H. V., Vică M. L. [21], Gherman, C., Enache, A., Delcea, C., Siserman C., [22], Delcea, C., Siserman C., [23] discuss the same ideas.

Thus, M Pilar Matud, Juan M Bethencourt, Ignacio Ibáñez [24] proved that women had more psychological distress than men. Although psychological distress in the women and men groups have some common correlates such as more stress, more emotional and less rational coping and less social support, we find some gender differences. Work role dissatisfaction was more associated with distress in the men than in the women group. In addition, women's distress was associated with more daily time devoted to childcare and less to activities they enjoy, and men's distress was associated with more time devoted to housework and less to physical exercise. Social roles traditionally attributed to women and men – and the differences in the use of time that such roles entail – are relevant in gender differences in psychological distress.

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Left Ventricular Remodelling – Predictive Factor of Morbidity and Mortality in Beta-Thalassemia Major

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Abstract

The objective of this paper is to present how long-term blood transfusion therapy in patients with beta-thalassemia major leads to excessive storage of iron in myocardium, causing structural and functional changes in the heart, which over time cause cardiovascular complications. Material and Methods used include: 41 patients with beta-thalassemia major (23 male) with a mean age 30.3±6.6 years, who used chelating therapy and 41 healthy young adults were included in this study. The mean follow-up period of beta-thalassaemic patients was 30.6±15.7 months. The study concludes that the iron load of the myocardium determines, from early stages, remodelling of the left ventricle, which is responsible for the occurrence of cardiac dysfunction, influencing the long-term morbidity and mortality in patients with beta-thalassemia major.

Keywords: beta-thalassemia major, iron overload left ventricular remodelling, serum ferritin, morbidity

1. Introduction

Betathalassemia major (β-TM) is considered the most common single gene disorder, in which the synthesis of the β-globin chain is affected, causing chronic haemolytic anaemia.

Patients present a state of chronic haemolysis, elevated iron absorption by the intestine, and require frequent blood transfusions leading to iron overload in organs and tissues including the heart, liver, glands, and skin [1, 2]. Although iron chelation therapy has become a common and essential part of beta thalassemia treatment, myocardial iron deposition causes cardiac dysfunction and remains the most important cause of mortality and morbidity in β-TM patients [3], its cardiac complications being the leading cause of mortality in 71% of β-TM patients [4].

The β-thalassemia cardiomyopathy is mainly characterized by two distinct phenotypes, a dilated phenotype, with left ventricular dilatation and impaired contractility and a restrictive phenotype, with restrictive left ventricular filling, pulmonary hypertension, and right heart failure. The pathophysiology of the disorder is multifactorial, with a central role of myocardial iron overload and the significant contribution of immuno-inflammatory mechanisms. [5].

Serum ferritin level is commonly used to assess body's iron stores, as it is relatively correlated with iron deposition in organs, but its level may be affected by several other conditions. Iron overload is correlated with cardiac performance as detected by echocardiography [6]. The myocardial iron content detected by magnetic resonance imaging has correlations with the ferritin level and the echocardiographic parameters of cardiac performance [6, 7].

Patients with beta thalassemia major remain asymptomatic with normal left ventricular function for a long period of time. Early identification of ventricular dysfunction, before the appearance of symptoms, can modify the prognosis of these patients by optimizing the chelation

treatment [8]. In this situation Doppler-echocardiogram with tissue Doppler has been proven to be an effective technique [9, 10].

In previous studies, cardiac remodelling was observed in patients with beta-thalassemia [11, 12]. The term ventricular remodelling refers to alteration in ventricular architecture, with associated increased volume and altered chamber configuration. Although originally described after myocardial infarction, left ventricular (LV) remodelling develops in response to a variety of forms of myocardial injury and increased wall stress [13]. Left ventricular ejection fraction (LVEF) is influenced by the degree of LV remodelling more than by any other factor [14]. At present, 2D echocardiography is a widely available and a well-established means of assessing LV remodelling. A number of studies have demonstrated the superior reproducibility of 2D echocardiography over M mode when it comes to measuring LV mass in normal subjects and those with abnormal LV geometry [15]. Beyond LV volumes, the pattern of LV remodelling was shown to carry an additional predictive value for vascular and heart failure-related events [16]. Cardiac remodelling involves both adaptive and maladaptive phases of development. At the initial stage, it represents an adaptive response to maintain cardiac output, whereas in the late stage, it results in the occurrence of heart failure. Oxidative stress appears to be the main factor that induces the transition from cardiac hypertrophy to heart failure [17, 18].

The improvement in survival rate in patients with beta-thalassemia during recent years could be explained by several factors such as advance in iron chelation, accessibility to safe blood, access to non-invasive procedures in evaluation of tissue iron, early detection of complications, improved compliance among patients and progress in other aspects of patient's medical care and nutrition [19].

2. Study Materials and Methods

Between November 2014 and February 2018, patients with β-thalassemia major, aged below 18 years old, were recruited into the study. These patients were undergoing regular follow-up in the haematology clinic (Haematological Institute of Bucharest) and our hospital (Elias University and Emergency Hospital Bucharest). We excluded cases with congenital heart disease, valvular heart disease, and history of hypertension, present or past history of heart failure. Written informed consents were obtained from participants or their parents. Initially, 62 patients were recruited, but only 41 of them could be followed up at least 1 year after enrolment. All patients had been receiving regular blood transfusion every 2 to 4 weeks and transfusion therapy had been started before the age of 4 years in all patients. All these patients were treated with oral iron chelator, Deferasirox in dose of 20-40 mg/kg, according to their serum ferritin level. Patients were evaluated clinically, biologically and echocardiographically at the beginning and at the end of follow up period. The evolution of possible complications was followed – the symptoms and signs of heart failure, the appearance of cardiac arrhythmias, mortality of any cause. The control group had 41 healthy individuals, who were at similar age and gender, with normal cardiovascular status. The control group was assessed cross-section, not followed in evolution.

All cases were subjected to full history taking (for symptoms, other diseases, drug history and history of transfusions), thorough clinical examination (for signs of heart failure), laboratory investigations (haemoglobin, fasting glucose and serum ferritin), electrocardiogram and imaging using Echo-Doppler and Tissue Doppler imaging echocardiography (TDI). The attempted procedures were performed within 1 week from transfusion in order to minimize any potential influence of anaemia on the assessment results.

2.1 Echocardiograph Examination

Transthoracic echocardiography was performed using an Aloka Prosound Alpha 7 ultrasound machine. We use M-Mode and two-dimensional echo to measure left ventricular end diastolic diameter LVEDD, left atrium size and thickness of interventricular septum (IVSd) and posterior LV wall (PWd) at diastole, ejection fraction LV(LVEF%), mitral annular plane systolic excursion (MAPSE). The mitral inflow velocity pattern was recorded in the apical 4-chamber view with the pulsed wave Doppler sample volume positioned at the tip of mitral leaflets during diastole. In Doppler tissue imaging (TDI), the sample volume was positioned at the medial (septal) end of the mitral annulus, in apical four chamber view with proper alignment of the examined area with the Doppler beam. The velocities of different waves then were determined (S, E', A') [20]. Measurements of the myocardial velocities were performed on two consecutive heart beats and the average of the three measurements was calculated. All patients were in sinus rhythm at the time of the examination.

To assess the LV filling pressures we analysed transmitral flow velocity and annular velocity (E/E') [21]. We used E' velocity obtained from the septal mitral annulus. Septal E/E' ratio <8 is usually associated with normal LV filling pressures and ratio E/E' >15 is associated with increased filling pressures [22]. When the value is between 8 and 15, left atrial size is useful to evaluate LV filling [23].

Left ventricular mass (LVMass) was calculated according to standard formula LV mass (g)= $0.8\{1.04[([LVEDD + IVSd + PWd]^3 - LVEDD^3)]\} + 0.6$ [24. Normal value for indexed LV Mass for female is lower than 95g/m2, respectively 115g/m2 for male. Relative wall thickness (RWT) was calculated using the following equation: RWT=2* PWd/LVEDD [24].

Consideration of LV mass and relative wall thickness, also known as LV end-diastolic diameter, allows classification of LV remodelling that includes virtually all LV remodelling changes that are seen in health and disease. Such architectural remodelling can be classified as eccentric or concentric. Therefore, a normal end-diastolic volume and an increased RWT pattern would be classified as concentric hypertrophy if LV mass is increased, and as concentric remodelling if LV mass is normal. These terms are currently used by the American Society of Echocardiography [25]. The term "eccentric" is applied exclusively to patterns with enlarged ventricles. Thus, eccentric geometry includes those with physiologic hypertrophy, eccentric hypertrophy, and eccentric remodelling. Eccentric remodelling is used when the LV chamber is dilated, but the LV mass is not increased (Figure 1).

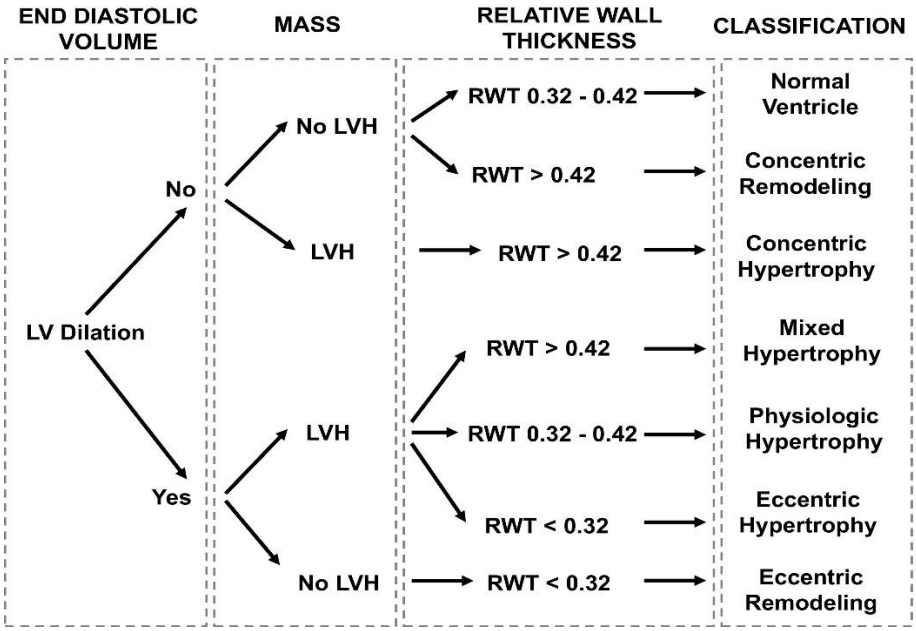

Fig. 2.1 Patterns of LV Remodelling

2.2 Statistical analysis

Data are shown as mean ± standard deviation (SD) and range or frequencies (number of cases) and percentages when appropriate. Comparison of numerical variables between the study groups was done by Paired samples t test. P-values less than 0.05 were considered statistically significant. We used risk relative function to evaluate the risk of some parameters. All statistical calculations were done using computer program SPSS (SPSS Inc.) version 20 for Microsoft Windows.

3. Results

We included 41 patients with beta- thalassemia major (23 male), aged 30.3±6.6 years and 41 healthy control group 30.4±5.7years old. The mean follows up period of beta-thallasemic patients was 30.6±15.7 months. The comparison between study and control group as for age and gender showed no significant intergroup differences

Table 3.1 Demographic and biochemistry data of the study's patients and control group

	β-TM I	**Control**	**P-value**
Age (years)	30.3±6.6	30.48±5.7	>**0.05**
Gender male/female	23/18	23/18	>**0.05**
Weight (kg) female	50.1±8	62.72±10.7	<**0.001**
male	63.6±8.8	84.82±10.08	<**0.001**
Height (cm) female	155.9±7.9	166.77±4.15	<**0.001**
Male	170±6.7	182.9±5.23	<**0.001**
Haemoglobin (g/dl)	9.68±0.68	13.64±0.92	<**0.001**
Diabetes or impaired oral glucose tolerance	17%	0	-
Hypotiroidism	14,6%	0	-

β-TM I – beta thalassemia major group at enrolment,
β-TM FU – beta thalassemia major group follow up period

The mean haemoglobin level of the patients was 9.61±0,6 g/dl, while the mean haemoglobin level of the control group was 13.5±0.9g/dl ($p<0.001$). This difference of values of haemoglobin will determine a hyperdynamic status, with increased cardiac output and affecting the interpretation of measures of ventricular function from echocardiography in study group.

All patients with thalassemia were receiving oral iron chelators regularly (deferasirox) and they were compliant to treatment, so the mean serum ferritin in the thalassaemic patients was low. It is an almost satisfactory value, the gold standard being below 1000 ng/ml, which shows the effectiveness of chelation treatment. In evolution, an increase in serum ferritin is observed, but statistically insignificant ($p>0.05$). It should be noted that at enrolment 63.4% of patients had serum ferritin below 1000 ng/ml and 48.7% after follow up period. But most patients had ferritin below 2500 ng/ml, both at enrolment and at the end (92.6%). If we look at the difference between the age of the patients and the duration of the chelating treatment, we notice that the patients are treated since preschool with iron chelators.

Table 3.2 Data for the beta thalassaemic patients

	β-TM I	**β-TM FU**	**P-value**
Haemoglobin (g/dl)	9.68±0.68	9.34±1.09	>0.05
Serum ferritin (ng/ml)	1004.3±875.6	1197.33±889.63	>0.05
Blood transfusion(U)/year	33.7±8.9	33.9±9.2	<0.001
Years of chelator therapy	22.3±6.85	25.1±7.1	<0.001

3.1 Echocardiography Findings

The assessment of systolic function by LVEF in the 3 groups shows that the LVEF in the study group at enrolment was significantly higher than in the control group (64.6±6.0% vs. 61.5±3.5%, p<0.05), which is explained by the hyperkinetic pattern caused by anaemia. In evolution, it can be seen that LVEF decreases statistically significantly in the study group, due to the changes caused by iron load in the myocardium (64.6±6.0% vs. 60.8±7.7%, p<0.001).

Evaluation of systolic function by tissue Doppler imaging, using the septal S' wave, shows a significant decrease in the study group after the follow-up period compared to study group at enrolment (0.76±1.3cm/s vs. 8±1.4cm/s, p<0.05).

Table 3.3 Echocardiograph LV systolic function beta thalassemia group and control subjects

	β-TM I	**β-TM FU**	**Control**	**P value**
LVEF %, N≥60%	64.6±6.0	60.8±7.7	61.5±3.5	<0.05
MAPSE (mm) N≥12mm	15.8±2.6	16±3.1	16.02±1.3	<0.05
S septal (cm/s), N≥7,5cm/s	8±1.4	0.76±1.3	10.4±1.7	<0.05

LVEF – left ventricle ejection fraction, S' septal – systolic myocardial velocities at the basal mitral annulus of the septal wall, mitral annular plane systolic excursion (MAPSE)

Following the evolution of the left ventricular ejection fraction, it was observed that all patients in the control group, as well as those in the enrolment study group have LVEF over 50%, but after the follow-up period, a percentage of 7.3% had LV systolic dysfunction (figure 3a). However, at inclusion it was observed that there was a percentage of 9.7% of patients who had a LVEF between 50-60% and which at the end of the follow-up period increased to 19.5%. (Figure 3.1 b)

Analysing the longitudinal systolic function parameters, it was observed that there are a high percentage of patients in the study group with impaired LV function evaluated by TDI, both at enrolment (21.9%) and at the end of the follow-up period (43.9%). The same was observed using the mitral annular plane systolic excursion (MAPSE) parameter; the number of patients with longitudinal systolic dysfunction at the end of study was double compared to initial evaluation.

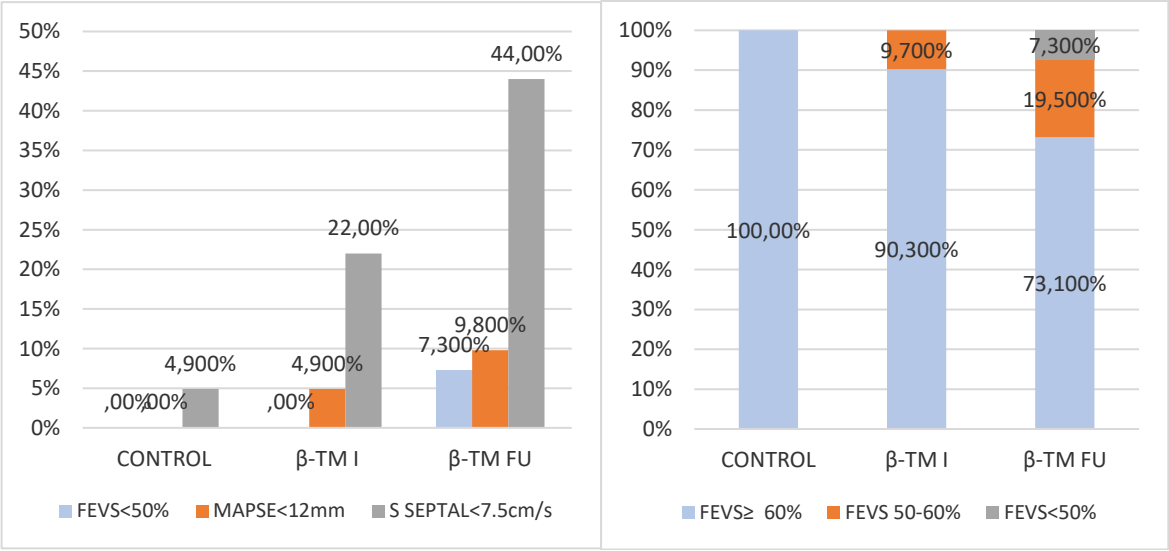

Fig. 3.1 a. Parameters of LV systolic function in study groups **b.** The assessment of LVEF in study groups

With the evaluation of the diastolic function by assessment of the mitral valve by TDI, we found statistically significant differences between both groups patients and control subjects in late diastolic myocardial velocities (A') and early diastolic myocardial velocities (E') at the

basal mitral annulus of the septal wall (p<0.001). The same was observed by analysing the E/E' ratio, used to evaluate the filling pressures of the LV. The Tissue Doppler imaging data are detailed in Table 3.3.

Table 3.4 Echocardiograph LV diastolic function beta thalassemia group and control subjects

	β-TM I	**β-TM FU**	**Control**	**P value**
E (m/s)	1.02±0.23	1±0.17	0.88±0,12	>0.05
E'(cm/s)	10.2±3	12.1±3	15.1±3.5	<0.001
E/E' N.<8	10.2±3	8.6±2.1	6.1±1.6	<0.001
E/A, N 1-2	1.68±0.67	1.65±0.76	1.38±0.25	>0.05
dTE, N 140-180ms	175.7±29.8	172.5 ±35.4	174.3±55.4	>0.05
A'(cm/s)	7.6±2.7	9±2.4	10.9±1.7	<0.001

early (E) and late (A) ventricular filling velocities, early(E') and late (A') diastolic velocity of the mitral annulus, dTE – deceleration time of E wave

Analysing the diastolic LV function, it was observed that there was a high percentage of patients in the study group with diastolic dysfunction and elevated LV filling pressure, both at enrolment (12.1% vs. 39%) and at the end of the follow-up period (21.9 vs. 48.7%).

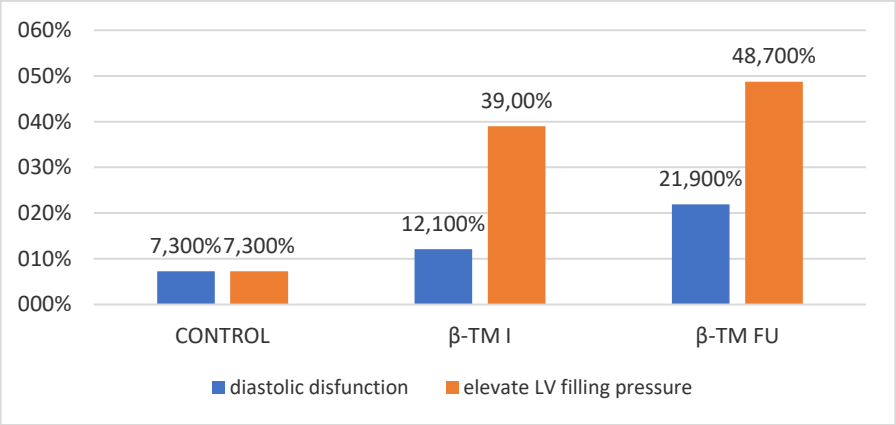

Fig. 3.2 LV diastolic functions in study groups

3.2 Left ventricular mass and left ventricular remodelling

According to echocardiograph findings, we showed left ventricular hypertrophy in patients with thalassemia compared with the control group. Average indexed LV mass on body surface area was higher both at enrolment (male 99.7±16.6, female 93.9±21 g/m2) and at the end of the follow-up period (male 105.6±19.8, female 93.5±22.7 g/m2). If we evaluate in dynamics the progression of myocardial hypertrophy, there was a significant increase in LV mass in men at the end of the follow-up period (p<0.001), compared to women, where there was no significant difference. We also revealed increased left ventricular end-diastolic diameter in the study group (Table 3.5).

Table 3.5 Left ventricular mass data

	β-TM I	**β-TM FU**	**Control**	**P-value**
LVEDD (mm)	49.5 ±4.5	49.6±5.3	45.1 ±3.1	>0.05
LV mass male (g)	173.3±33.4	184.3±36.5	143.5±17.9	
indexed LV mass in male(g/m2)	99.7±16.6	105.6±19.8	69.1±7.7	<0.001
LV mass female(g/m2)	137.7±30.9	137.1±31.9	125.2±22.9	
indexed LV mass in female(g/m2)	93.9±21	93.5 ±22.7	72.7±9.5	>0.05

LVEDD: left ventricular end diastolic diameter

In patients with thalassemia alterations in left ventricular geometry were detected. In control group all patients had a normal LV mass. In study group, although at enrolment the LVEF was over 50%, there were a high percentage of patients with LV remodelling (31.8%), out of which 24.3% of patients had hypertrophy of LV. At the end of the follow-up period we noticed, that 39.1% of patients had cardiac remodelling.

Table 3.6 Evaluation of cardiac geometry

	β-TM I	**β-TM FU**	**Control**
normal geometry	68.2%	60.9%	90.2%
concentric remodelling	2.4%	2.4%	9.8%
eccentric remodelling	4.8%	9.7%	0
concentric hypertrophy	7.3%	7.3%	0
eccentric hypertrophy	17%	19.5%	0

Analysing the parameters of LV systolic function according to the type of cardiac remodelling at the end of the follow-up period, it is observed that all of the 3 patients with LVEF below 50% had LVEF over 60%, but had eccentric hypertrophy at enrolment. One of these patients died in 6 months after a rapid deterioration of systolic function (LVEF 15%). We also observed pathological values of sepal S' waves in the group of those with LV remodelling both at enrolment and at the end of follow-up (RR 1.53 vs. 1.83). It has also been noted that elevated LV filling pressures are associated with cardiac remodelling in patients with beta thalassemia major (RR 2.5 vs. 3.37).

3.3 Analysis according to ferritin level

The study group was analysed according to average ferritin values during follow-up period, and we chose a value of 1000 ng/ml, because we consider it as a 'gold standard'. When serum ferritin is greater than 1000 ng/ml, a significant increase in myocardial mass was observed for both men ($p<0.001$) and women ($p<0.05$).

Also, the LV systolic function, assessed by LVEF and S' septal wave, is statistically significantly lower at the end of the follow-up period, compared to enrolment. It should be noted that these results are not significantly influenced by gender, age, disorders of glucidic metabolism, hypothyroidism and serum haemoglobin values.

Depending on the ferritin level, it is noted that serum ferritmin over 1000 mg/ml correlates with an increased rate of LV hypertrophy, especially at the end of the follow-up period, compared with its rate at the beginning of the enrolment period (RR 6.75 vs. RR 1.21)

We can conclude that ferritin levels are suitable for evaluating the evolution of LV systolic function and the appearance of LV hypertrophy.

Table 3.7 Comparison of study groups when seric ferritin level≥1000mg/dl

	β-TM I	**β-TM FU**	**P value**
LV Mass index male(g/m2)	100.6±21.03	110.6±23.36	>0.001
LV Mass index female (g/m2)	97.25±19.39	99.75±21.22	<0.05
S' septal (cm/s)	7.7±1.4	7.9±1.4	<0.05
FEVS (%)	64.2±6.5	59.2±8.7	<0.05
MAPSE (mm)	15.5±2.4	15.2±3.6	>0.05

3.4 Cardiac complications

As can be seen in figure 4, the most common cardiovascular complication is LV hypertrophy. However, if we analyse in particular the rest of the complications (heart failure, LV systolic dysfunction, atrial fibrillation, pulmonary hypertension), it was found that they occurred in patients with cardiac remodelling. It should be noted that one of the deaths occurred

in a patient who rapidly developed heart failure with severe LV systolic dysfunction, and the other death occurred as a result of bronchopneumonia.

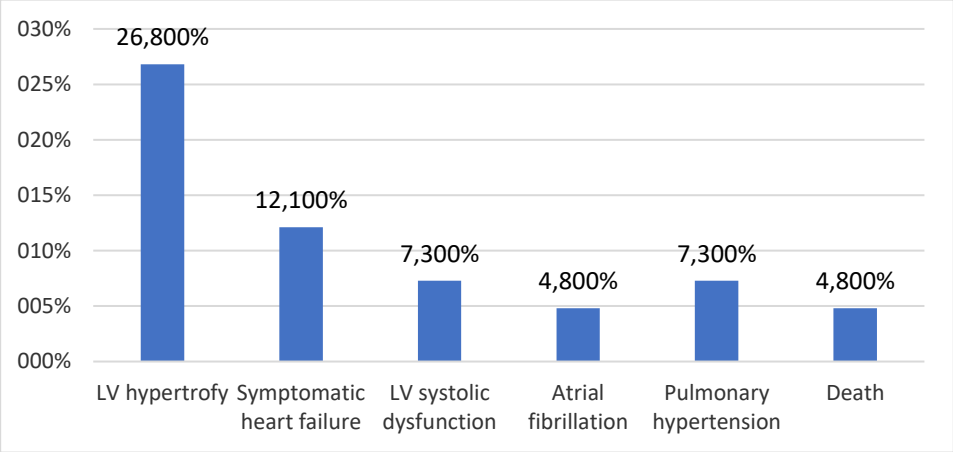

Fig. 3.3 Cardiac complications during the following period

4. Discussions

Cardiac structure and function in thalassemia major patients are mainly affected by two factors: increased cardiac output and iron overload. Anaemia caused hemodynamic alterations characterized by volume overload and increased cardiac output, with consequent development of eccentric ventricular hypertrophy and chronic maintenance of this state can evolve to heart failure [26, 27]. The difference of values in medium haemoglobin between study and control group (9.61±0,6 g/dl vs. 13.5±0.9 g/dl, p-value<0.001) will determine a hyperdynamic status, which increases cardiac output and affects the interpretation of measures of ventricular function from echocardiography in study group. The systolic function's assessment shows that the LVEF in the study group at enrolment was significantly higher than in the control group (64.6±6.0% vs. 61.5±3.5%, p<0.05), which is explained by the hyperkinetic pattern caused by anaemia.

This study shows that in young adults with β thalassaemia but no clinical signs of heart failure at enrolment, there are abnormalities of left ventricular morphology and systolic and diastolic functions. All these findings are in agreement with those reported by other studies.

Iron storage in the myocardium mainly causes damage to left ventricular function over time [28]. Our study also shows a decrease in left ventricular systolic and diastolic functions over time, owing it to an increase in the after load and a reduced contractile state, which is secondary to iron toxicity [29]. Assessing the systolic function by LVEF in evolution, it can be seen that FEVS decreases statistically significantly in study group, due to the changes caused by the accumulation of iron in the myocardium (64.6±6.0% vs. 60.8±7.7%, p<0.001). Also, the evaluation of longitudinal systolic function by tissue Doppler imaging, shows a significant decrease in the study group after the follow-up period compared to study group at enrolment (the septal S' wave 0.76±1.3cm/s vs. 8±1.4cm/s, p<0.05).

Evaluating the diastolic function by assessment of the mitral valve by TDI, it was observed that there is a high percentage of patients with diastolic dysfunction and elevated LV filling pressure, in the study group, both at enrolment (12.1% vs. 39%) and at the end of the follow-up period (21.9 vs. 48.7%). Tissue Doppler Imaging (TDI) can show additional information compared with other echocardiography techniques, detecting even minor changes before the occurrence of abnormal indices of global ventricular dysfunction [30]. In our study assessment of the mitral valve with pulsed TDI showed statistically significant differences between the patients, and the control subjects in early (E') and late (A') diastolic myocardial velocities and systolic myocardial velocities (S') at the basal mitral annulus of the septal wall. In accordance

with these findings, other authors had reported significant lower tissue Doppler systolic velocity in the beta thalassemia group compared to controls [30, 31]. We found that Septal E/E' ratio was significantly higher in thalassemia patients when compared with controls. This was in agreement with authors [32], who found that there was a significant elevation in E/E' in the β-TM patients compared to the control group. The E/E' ratio has a special diagnostic importance for diastolic dysfunction among thalassaemic patients due to its load's independent nature and linear correlation with LV end diastolic pressure.

Cardiac hemochromatosis generally causes dilated cardiomyopathy characterized by an increase in left ventricular diastolic diameter, with remodelling and the appearance of hypertrophy of LV. According to echocardiographic findings, we showed left ventricular hypertrophy in patients with thalassemia compared with the control group. This finding coincides with other studies that reported a significant increase in LV mass in beta thalassemia patients than controls as well [33]. Average indexed LV mass by body surface area was higher both at enrolment and at the end of the follow-up period. If we evaluate the evolution of myocardial hypertrophy in dynamics, there is a significant increase in LV mass in men at the end of the follow-up period ($p<0.001$). However, in women there is no significant difference.

In patients with thalassemia**,** alterations in left ventricular geometry were detected. Although at enrolment, their FEVS was normal, over time there was a high percentage of LV remodelling (31.8%), out of which 24.3% of patients had hypertrophy of LV. At the end of the follow-up period we noticed, that 39.1% of patients had cardiac remodelling.

Significant correlation between left ventricular ejection fraction and serum ferritin concentration was found, and patients with higher (>1000ng/ml) serum ferritin concentrations had a lower ejection fraction [34, 35]. When values of medium ferritin were greater than 1000 ng/ml, a significant increase in myocardial mass was observed both men ($p<0.001$) and women ($p<0.05$). Also, the LV systolic function, assessed by LVEF and S' septal wave, was statistically significantly lower at the end of the follow-up period, compared to enrolment. It should be noted that these results are not significantly influenced by gender, age, disorders of glucidic metabolism, hypothyroidism and serum haemoglobin values. Depending on the ferritin level, it is noted that serum ferritin over 1000 ng/ml is correlated with an increased rate of LV hypertrophy, especially at the end of the follow-up period, compared to the beginning of the enrolment period. Therefore, we can conclude that ferritin levels are suitable for evaluating the evolution of LV systolic function and the appearance of LV hypertrophy. Other studies suggest that ferritin level is not a reliable marker for evaluating serum iron levels because it also increases in several chronic diseases, in infections and inflammatory diseases as an acute phase reactant [36].

Patients receiving regular transfusion and proper iron-chelation usually survive beyond the fourth decade of life. The cardiovascular complications of thalassaemia can be classified into two major clinical categories: iron overload complications and non-iron overload complications. They interfere with each other and are represented by myocardial dysfunction, arrhythmias and sudden death, pulmonary hypertension and loss of vascular compliance.

Currently, cardiac complications such as heart failure and serious arrhythmias resulting from myocardial siderosis are the most common cause of mortality in patients with thalassemia [4, 37]. In our study the most common cardiovascular complication was LV hypertrophy, which was the key factor in the occurrence of other complications such as heart failure, LV systolic dysfunction, atrial fibrillation, pulmonary hypertension. Also, death occurred only in the following two circumstances: in a patient who developed rapidly heart failure with severe LV systolic dysfunction, the other one being a patient who had infection as the main cause, which developed into bronchopneumonia.

Our study presents some limitations such as the small number of individuals and no availability of strain and speckle tracking data. A possible limitation of this study's results may

be due to associated anaemia in beta thalassemia group, compared to the control group. Another limitation is the lack of availability in the usage of T2 magnetic resonance imaging, as a diagnostic marker of body iron overload.

5. Conclusions

Cardiac changes in patients with beta-thalassemia are mainly due to iron loading of the myocardium and Tissue Doppler imaging is superior to conventional echocardiography in giving an early evidence of systolic and diastolic myocardial dysfunction in non-symptomatic thalassemic patients. Numerous studies Delcea C, Enache A, Stanciu C, [38], Delcea C, Enache A, Siserman C. [39], Gherman C, Enache A, Delcea C. [40], Delcea, C., Fabian, A. M., Radu, C. C, Dumbravă D. P. [41], Rus, M., Delcea, C., Siserman C., [42], Siserman, C., Delcea, C., Matei, H. V., Vică M. L. [43], Gherman, C., Enache, A., Delcea, C., Siserman C., [44, 45] confirm our results. Serum ferritin was correlated with left ventricular hypertrophy and treatment with iron chelators should keep serum ferritin levels below 1000 ng/ml to prevent cardiovascular complications. Overall, we can conclude that the iron load of the myocardium determines, from early stages, remodelling of the left ventricle, which is responsible for the occurrence of cardiac dysfunction, influencing the long-term morbidity and mortality in patients with beta-thalassemia major.

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The Implications of Alcohol Consumption in Forensic Medicine

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Abstract

The consequences of the clinical manifestations given by alcohol intoxication are important in research, in clinical practice, in the legal field and forensic medicine. Moreover, most cases of high violence are based on alcohol consumption. Forensic medicine intervenes in such situations by determining the value of blood alcohol, helping the legal system in solving cases with such implications. In this sense, we conducted a short observational study within the Institute of Forensic Medicine from Cluj-Napoca Romania on the implications of alcohol consumption among deaths during one-year time, which is presented in this paper.

Keywords: blood alcohol, forensic medicine, alcohol intoxication, violent death

1. Introduction

Alcohol intoxication refers to a harmful clinical condition, induced by recent alcohol consumption, when it together with its degradation products accumulate in the body faster than they can be metabolized in the liver [1]. Due to the long history of alcohol consumption as a recreational drink, the clinical manifestations are often not taken seriously and therefore the side effects are often ignored [2].

Every aspect of daily life can be negatively influenced by recreational alcohol use. The most publicized example involves road accidents with intoxicated traffic participants. It is known that driving is more dangerous the higher the blood alcohol level [3].

It is important that from a forensic point of view we know data related to pharmacokinetics and dosimetric methods in order to understand this phenomenon. In addition, alcohol-related cognitive impairment is to blame for personality disorders, which is often characterized by aggression, risky sexual behaviour, dangerous driving, and a more pronounced tendency to commit suicide [4].

Alcohol consumption is increasing from one year to another and it's found in all layers of the society, what is different is the quality of alcohol consumed. The medico-legal aspects related to alcohol consumption are multiple, the implications being visible in road accidents, driving crimes under the influence of alcohol, in cases of domestic violence, in cases of rape or in the possibility of affecting the mental capacity in a psychiatric forensic examination.

However, the determination of alcohol consumption is most common in forensic autopsies.

Here the role of alcohol is often as an adjunct factor in the production of death, whether it is a violent or pathological death.

In all these forensic situations, the determination of alcohol consumption must be documented, by a correct anamnesis, an evaluation of the risk factors and later by a fast and efficient quantitative blood alcohol determination. Within the forensic services, the determination of blood alcohol level is made from the blood collected either from the living

person or from the deceased person using the national gas chromatographic method. A correct determination of the alcohol level leads to a correct legal classification of the deed.

From a medical point of view, alcohol consumption has even more implications, chronic consumption leading to gastric, hepatic, renal, vascular, neurological or even psychiatric damage. It must be realized that alcohol addiction is a problem with multiple implications that require specialized treatment, in the absence of which more serious implications can sometimes appear among the forensic ones stated above.

1.1 Alcohol consumption indicators

Alcohol consumption indicators are substances that are specific to certain aspects of alcohol consumption. They can distinguish between chronic ethanol consumption and acute real consumption and may differentiate, to some extent, the moderate consumption from that in very large quantities [5].

Consumption indicators have multiple roles in rehabilitation and addiction programs, occupational medicine, forensic medicine and research. Overall "there are 3 classes of indicators:

1. Sensitive enough tests to detect even a single alcohol intake known as acute or recurrent markers: Ethanol, 5-Hydroxytryptophol (5HTOL), Ethyl glucuronide (EtG), Ethyl sulphate (EtS), Fatty acid esterase (FAEE).

2. Tests indicating metabolic impairment or organic dysfunction caused by prolonged exposure to alcohol: γ-Glutamyl transferase (GGT), Alanine aminotransferase (ALT), Aspartate-aminotransferase (AST), Medium erythrocyte volume (MCV), Transferrin-Carbohydrate-deficient (CDT) and Phosphatidylethanol (PEth).

3. Tests that reveal the possibility of a person having a genetic predisposition to increased consumption of ethanol and dependence. These predisposition markers are based on the identification of an enzymatic or receptor disturbance. People that are large consumers, from a young age, show personality disorders and a tendency to dangerous experiences or drug abuse [6].

The most important indicator of recent alcohol consumption is the dosage of alcohol in various body fluids or exhaled air. Analytical procedures for the quantification of alcoholic oxidation intermediates, such as acetaldehyde, are more complex and unused on a large scale [5]. Ethyl sulphate and ethyl glucuronide are direct markers of alcohol consumption, as opposed to γGT or MCV which are indirect markers of alcohol consumption.

These last indicators represent minor metabolites of ethanol. They are reaction products formed by secondary routes of alcoholic metabolism, respectively the non-oxidative pathway.

Another method that certifies alcohol consumption is based on chromatographic analysis of congeners in alcoholic beverages. These are represented by: methanol, 1-propanol, iso-butanol, 1-butanol, 2-butanol etc. Given that their proportions are known in most alcoholic beverages, the type of beverage consumed can be determined [7]. Also, a high concentration of methanol raises the suspicion of a chronic consumption of alcoholic beverages.

1.2 Pharmacology

Ethanol is a water-soluble substance that easily crosses membranes, resulting in an easy balance between intra- and extracellular space. The balance between the compartments is achieved by diffusion and depends on the amount of water present at that level [8]. Alcohol, in small quantities, is usually formed in the body but produces a tiny blood alcohol level of 0.015 ‰ [9].

By inhalation the maximum value reached is 0,2 ‰ and no relevant concentrations are reached trans-dermic [10]. After ingestion, it is rapidly absorbed from the major gastrointestinal tract in the upper part of the duodenum and small intestine and in the stomach, it is absorbed

only 15% [8]. In optimum conditions, 80-90% of the ingested amount is absorbed in the first 60 minutes, being known that the presence of food delays this process [1]. However, absorption continues for a variable period of time after ingestion; the blood alcohol concentration increases until the elimination rate exceeds that of absorption. Therefore, the peak blood concentration is given by the rate of absorption [10]. The maximum concentration is reached 30-90 minutes after ingestion [11].

The main enzyme involved in the oxidation of alcohol is alcohol dehydrogenise present in the stomach and liver. Gastric metabolism is reduced in alcoholics [9]. This enzyme metabolizes ethanol to acetaldehyde, which is further converted under the action of mitochondrial NAD-dependent aldehyde dehydrogenise into acetate. This further causes intense cardiovascular and hemodynamic effects [6].

The elimination process begins immediately after consumption has started [7]. The elimination rate of ethanol is determined by the activity of alcoholic hepatic dehydrogenise.

Most alcohol is metabolized in the liver and eliminated through the kidneys.

There is a small amount of ethanol, in the proportion of 5-10%, which is eliminated unchanged by the kidneys, lungs and sweating. On average, an amount of 100-125mg/kg/h is metabolized, which increases in people with chronic alcohol consumption through the intervention of the microsomal oxidation system. The elimination rate is around 20 mg/dl/h, however with individual variations (standard deviation 6 mg/dl/h) [1].

The ethanol kinetics has the particularity of having a fixed elimination rate that does not depend on the amount of substrate. It decreases by 15 ‰ / h until complete blood ethanol purification. This feature is known as linear elimination and is caused by a limited amount of NAD +. It may look slightly exponential at high concentrations, but this is negligible [7].

There are several factors that influence the ethanol metabolism curve. First of all, the presence of food in the stomach not only slows down the absorption but also accelerates the metabolism of alcohol. This metabolism is faster only in the first 2 hours after ingestion; after this interval the metabolism curves under fasting conditions overlap with those under food consumption conditions [11]. Solid foods delay the absorption of alcohol more than liquid foods. [10]

1.3 Clinical consequences

Even though alcohol has the potential to affect any organ, the most important are the neurological, cardiovascular, respiratory and digestive consequences [2]. Alcohol in small doses has an inhibitory effect on the nervous system and at high doses has a systemic inhibitory effect. In the first phase, the activity of the areas of the brain that have high behavioural integration functions decreases. The activity of the cortex being slowed down, the behaviour becomes animated and the restrictions are lost, giving the impression of false stimulation. Mild intoxication is manifested by an exhaustive, emotionally unstable, uninhibited, gregarious behaviour. These phenomena occur in the range of blood alcohol levels of 0.5-1.5 g‰.

As the intoxication worsens, the behaviour can become aggressive, disoriented, dysarthric or lethargic with the ability to coordinate affected [1]. Thus, at concentrations ranging from 1-2.5‰, proper intoxication occurs, often attributed to acts that have forensic consequences.

Intoxicated people experience difficulties in performing simultaneous activities, studies show that this happens after ingestion of 0.37 g/kg body of alcohol [6].

Reasoning and discernment are also affected. Intoxicated people deny or underestimate the fact that their cognitive and motor functions are affected [2]. Postural control becomes impaired starting with values above 30mg/dL [6].

Alcohol has an irritating effect on the digestive tract producing esophagitis, gastritis, ulcers and spasm on the pylorus. Vomiting can lead to Mallory Weiss and hematemesis. Acute pancreatitis is another possible consequence of chronic alcohol consumption. By impairing

gluconeogenesis, episodes of alcohol intoxication lead to hepatic steatosis. Harmful effects on the cardiovascular system are manifested by increases or decreases in blood pressure, tachycardia and malignant ventricular arrhythmias [2].

In the last phase, the intoxication is deep, the defences of the respiratory tract are lost, becoming possible the aspiration of secretions from the digestive tract or foreign bodies. The risk of death from respiratory depression also increases [1].

The state of anaesthesia accompanied by the suppression of reflexes and possibly hypothermia is characteristic of blood alcohol levels in the range of 2.5-4.5‰ [6].

Other symptoms that those intoxicated may experience are: diaphoresis, redness of the skin or mydriasis. The accumulation of acetaldehyde is what causes the characteristic reaction of skin erythema, headache, and palpitations and is more often experienced by the Asian population.

From a metabolic point of view, alcohol intoxication causes hypoglycaemia, lactic acidosis, hypokalaemia, hypomagnesaemia, hypocalcaemia, hypophosphatemia and hypoalbuminemia.

Zieve Syndrome which includes: haemolytic anaemia, jaundice and hypertriglyceridemia, is a less common phenomenon, but mentioned frequently in medical publications [12].

1.4 Dosimetric methods

Ethanol can be detected in the blood of living people up to 6-8 hours after consumption, depending on the amount consumed. Higher blood alcohol levels require a longer period to reach the level undetectable by laboratory equipment. Methods of determining blood alcohol levels have evolved over the last century. The first chemical oxidation took place a hundred years ago, procedure that today is no longer used [5].

One way to determine blood alcohol level is the enzymatic method, which occurs after alcohol dehydrogenise has been purified from animal liver. The enzyme of hepatic origin has a lower specificity than the one extracted from yeast, which does not oxidize methanol, a fact that is still used today. The procedure can give in some conditions false positive results [6].

For example, increased amounts of lactic acid in the analysed blood may interfere with the enzymatic method. Because considerable amounts of lactic acid are formed post-mortem, this method is not used in this context [5].

About 50 years ago, physicochemical methods for determining blood alcohol levels appeared: infrared spectrometry, electrochemical oxidation, and gas chromatography. Since then, gas chromatography has been the method of choice for the analysis of biological liquids, while electrochemical and infrared methods are used to determine the concentration of alcohol in expired air [6].

Gas chromatography in combination with mass spectrometry is the gold standard for determining blood alcohol content [5]. It uses the whole blood that is diluted in an aqueous solution in a ratio of 1 to 5, and add t-butanol or n-propanol, substances used as an internal standard. The mixture is converted into a volatile phase, and with the help of a gas (mobile phase), it passes through a long capillary duct with a very small diameter containing the stationary liquid phase. The volatile mixture is distributed between the 2 phases, thus separating. An ionization detector analyses the data obtained from this level. The concentration is calculated by comparison with the known internal standard. The best performing device can analyse 110 specimens simultaneously [6].

Urinary alcohol determination is required in certain workplaces and is useful in the justice system and in certain rehabilitation programs. The methods mentioned for determining the blood alcohol concentration can also be used for this type of fluid. Unchanged excretion of ethanol in the urine is 2%. In the distribution phase, the ratio of alcohol in the urine to blood is 1-1.2, reaching maximum values of 1.4 in the post-absorption phase [5].

1.5 Forensic expertise

In the post-mortem analysis of blood alcohol, the methods are similar to those performed in living people. The interpretation of the results obtained from the necropsy samples presents a series of difficulties given by: in homogeneity of the blood, post-mortem production of alcohol, diffusion of ethanol from the stomach. On the other hand, an autopsy allows the collection of blood from areas that are not accessible during lifetime [6].

Determining the blood alcohol concentration is very important in forensic autopsy when it comes to civil or criminal implications. The expertise is not limited to establishing that alcohol intoxication was the sole cause of death or part of a conglomeration of factors that led to its production, but also distinguishes between true and apparent intoxication, where it is more likely to be post-mortem alcohol neogenesis [13].

Determining alcohol concentration is one of the routine tests performed in the field of forensic medicine. The determination of blood alcohol level in people who died outside the hospital gained proportions of routine examination, being motivated by the fact that the pathological lesions in bodies intoxicated with alcohol are nonspecific [14].

The post-mortem blood alcohol concentration is affected by several factors such as: age, sex, body weight, and history of alcohol consumption, pre-existing pathologies and time of death, and the stage of decomposition of body. A few hours after death in the blood, the processes of coagulation and fibrinolysis take place simultaneously. The efficiency of the lyses reaction of the clots will determine the degree of fluidity of the blood. Given that the alcohol is distributed in the serum, it is desirable that the sample be as homogeneous and liquid as possible.

Harvesting is performed at the limbs, where the blood is poorer in clots [16, 17].

However, research data indicate that neither the presence of clots nor the water content of corpses have such a large impact on the sample. The correction of the results according to the alcohol coefficient is practiced only in Germany [6, 18].

Some authors claim that the percentage of water in the body greatly influences the alcohol concentration in the first 230 hours. After this period, the degree of putrefaction has a greater impact on the alcohol concentration than on the body's percentage of water [15].

It is known that sudden death of cardiovascular origin is influenced by alcohol consumption.

A study in Finland showed that 4 out of 10 people with sudden cardiac death have alcohol intoxication at the time of death, most often men and ischemic heart disease [18].

In addition to the alteration of the coronary vessels, there are other morphopathological aspects in the myocardium present in people who have died with detectable blood alcohol levels.

One study shows that there are statistical differences in the number and microscopic appearance of cardiomyocytes in people exposed to alcohol. They are fewer in the field, more segmented and with larger nuclei. The degree of cardiac changes is proportional to the alcohol level of the corpses, these changes being presumed to have led to death due to rhythm disorders, but they occur as a result of repeated episodes of alcohol consumption [19].

The analytical method of choice for determining the blood alcohol concentration is gas chromatography. Gas chromatography is a safe method even when there are substances formed in the decomposition process that can interfere with this process. Low concentrations below 30mg/dL are being debated [17].

There is a new method of ethanol detection, still in the experimental phase which could be used for forensic purposes and which involves the ethanol quantification by electrochemical process using an unmodified carbon electrode linked on a screen. [20]

Sampling can be performed from other biological matrices such as: urine, vitreous humour, sequestered gastric contents, hematomas, bile, brain, cerebrospinal fluid, skeletal muscle, liver [6].

However, in addition to blood, the most commonly used are urine and vitreous humour [21].

Analysis of multiple blood samples can only partially compensate for the difficulties given by post-mortem changes. For a more correct interpretation of the results, information from the death scene and anamnesis data are needed [6].

1.6 Typology of deaths associated with alcohol consumption

Alcohol consumption is known as a potentiator of the risk of death due to violence, being blamed for its effects against rational thinking and for decreased motor and sensory functions of the body. In addition, it predisposes to aggression, tendencies to self-destruction and childish risk-taking. It has an impact on the legal system in terms of the fact that high levels of blood alcohol concentrations are associated with both the possibility of committing crimes and the possibility of becoming a victim more easily. Alcohol consumption is either the cause of death or contributes to a substantial number of violent deaths [22].

A study of a batch of 1455 autopsies showed a close correlation between alcohol consumption and this risk [23].

Another paper aims to analyse the distribution of the typology of deaths in cases where blood alcohol levels were present at values lower and higher than 0.3 g/dL. The results indicated that traffic accidents were the most common fatality for both groups, followed by suicide. Other accidents such as food bowl asphyxia or exposure to fire were more common in subjects with higher blood alcohol levels [24].

The cause of death may vary with the phases of the alcohol metabolism curve. Based on the difference between the alcohol concentration of blood and urine, a Finnish study analysed the percentage and type of deaths in the absorption phase, the phase of maximum concentration and the post-absorbent phase, or the elimination phase. Although most died in the post-absorption phase, deaths caused by road accidents had a higher prevalence in the maximum concentration phase [25].

Alcohol consumption affects thermoregulation and depending on the ambient temperature can contribute to hypothermia or hyperthermia. Hypothermia accompanied by alcohol consumption is well known in the medical literature. Ethanol produces vasodilatation, inhibits chills and thermoregulation and biochemical effects shorten survival time. The contribution of alcohol among deaths by hyperthermia is not fully known but the loss of life in Finnish saunas is accompanied by relevant blood alcohol levels [6].

There are data attesting to the link between death by mechanical asphyxia by occlusive mechanism of the respiratory airways and alcohol intoxication. One such example is given by an Australian study that raises the issue of accidental drowning in rivers, where about 40% of selected subjects had blood alcohol levels above 0.20% [26].

Another cause of death by asphyxia and correlated with the presence of alcohol is represented by the occlusion of the larynx with food bowl, being known that alcohol induces emesis and suppresses the pharyngeal reflex favours aspiration. In cases where food debris has incompletely obstructed the larynx, the issue of post-mortem mobilization of the gastric contents in the respiratory tree is raised more quickly [27].

Therefore, more attention should be paid to the position of the corpse throughout the investigation. In addition, airway compression by accidental postural asphyxia poses another risk of death [6].

From the point of view of the influence of alcohol on suicide, things are not yet fully understood, but this substance amplifies self-harm. The demographics of the chosen methods vary depending on gender; men opting for hanging while women prefer less violent methods such as self-poisoning. They also differ by region, with people in Central Asia using pesticides used in agriculture, while in Western European countries such as Sweden, alcohol is used together with medicines [28].

In addition, the ethanol concentration has an impact on the lethality of suicide methods, an idea demonstrated by a Korean study. This correlation can be rendered as a non-linear bell-like distribution. The classification of suicide methods presented in this study included as high-risk methods: hanging, drowning, jumping from a height, etc. and low-risk methods: overdose and use of a sharp object during the act. The first category was assigned average concentrations between 0,150-0,199%, suggesting that less severe intoxication predisposes to this behaviour [29].

Drowning is the only high-risk method chosen more frequently by the female population than the male population. In Sweden, one in three drowning deaths is suicide, with alcohol being detected in 16% of autopsies [30].

A Swiss study similar to the Swedish one analysed the distribution of suicidal methods and concluded that the use of firearms is attributed to high blood concentrations of alcohol like other methods with high lethality unlike the Korean study which attributes them to the average.

Another factor analysed was the fact that chronic alcohol dependence is associated with acute alcohol intoxication at the time of death [31].

In the United States, in a national analysis conducted from 2003 to 2011, alcohol was detected in 36% of men and 28% of women who died by suicide [32].

Regarding the ethnicity of the people living in that territory, they drank alcohol before suicide: 47% of Native Americans, 23% of Asians, 28% Hispanics. Most were young men living in the metropolitan area [33].

Regarding traffic accidents, it is known that alcohol intoxication has increased the frequency of deaths in many developed countries such as the United States. Alcohol consumption increases the risk of accidents, especially for people aged 16-24, during the night, although there is a tendency to reduce these events [34].

A similar situation is found in Australia where young men aged 16-21 represent the largest proportion of drivers who had consumed alcohol [35]. In New Zealand, a study showed that not wearing a seat belt, lack of driver experience and alcohol consumption were the risk factors with the deadliest potential [36].

The combination of high blood alcohol level and trauma leads to increased preclinical mortality. Both drivers and pedestrians under the influence of alcohol were more frequently injured and experienced a higher impact speed [37].

In addition, intoxicated patients require several days of hospitalization, which can be explained by the presence of a greater number of lesions [38]. In connection with the traumas caused by the fall, alcohol and psychoactive drugs increase the risk of death in the pre-hospital phase by 2.80 times. Craniofacial injuries caused by falling from orthostatism are closely correlated with the presence of alcohol. However, there is no link between studies on the severity of injuries to people under the influence of alcohol during trauma and the actual severity of intoxication [39].

For example, an American study concluded that patients with high blood alcohol levels above 400 mg/dL had less severe lesions than those with a mild intoxication. However, the analysis of the data on the deaths of subjects caused by road accidents related to alcohol intoxication, the results indicated quite high percentages [40].

Injuries caused by burns associate increased levels of morbidity and mortality with duration of hospitalization that doubles in drunkenness. Experimental data indicate that episodes of alcohol consumption rapidly increase mortality from burn injuries. This model of ethanol consumption, which involves ingesting 4-5 standard drinks in a short period of 2 hours, is adopted by millions of people several times a month [41].

The relationship between obesity and lethal ethanol intoxication revolves around the idea that suppression of respiratory function is more severe in obese subjects. A Swedish study concluded that they have an increased risk of death at lower ethanol concentrations [42].

Regarding the contextualization of alcohol intoxication, it can have a lethal potential in any type of daily activity. For example, in the field of agriculture, a Polish study draws attention to fatal accidents at work by handling under the influence of alcohol equipment and machinery where 41% of victims had consumed alcohol [43].

On the other hand, relaxation activities are affected by consumption. In the context of navigation, in a southern American, 12.2% of deaths were associated with the presence of alcohol [44].

2. Study Material and Method

The present study focuses on deaths associated with acute alcohol consumption. In other words, it directly targets subjects who have died in the presence of detectable blood alcohol levels. In this sense, it is well known that alcohol impairs motor and behavioural functions, which may be reflected to some extent on the type of death. Therefore, the aim of the study is to draw attention to the current situation of deaths in the context of alcohol consumption and to be a starting point for another research.

Literature data indicates that alcohol is detected in about half of violent deaths and therefore screening in this regard is desirable [6].

Furthermore, the presence of alcohol in association with the thanatology mechanism is not only important in the case of violent deaths but can also be significant in the case of nonviolent deaths. The information disclosing this data can be found only by doing autopsy report [45].

The study was an observational and descriptive retrospective one. The subjects were taken from the Institute of Legal Medicine Cluj-Napoca, which contained a number of 799 deaths in the period January 1, 2017-January 31, 2017.

Of the total of 799 autopsies, 342 cases had a 0-blood alcohol level, in 340 autopsies there wasn't collected a blood sample due to a long-term hospitalization and 117 autopsies presented detectable blood alcohol levels. The studied group consists of the 117 subjects who had measurable blood alcohol levels during the autopsy. Of these, 109 were male and 8 were female.

3. Results and Discussions

Among the autopsied subjects in Cluj County, the share of males was significantly higher than that of females, which amounted to only 7%. This is due to the fact that the consumption is more common among men in most countries. Although most men were in the phase of mild intoxication, the actual intoxication occupied a close next position. The women showed an equal distribution in all phases of ethanol intoxication. This may suggest that although alcohol consumption among women is much lower than that of the opposite sex, the consumption pattern may be similar. There are insufficient data to prove this, although short-term high alcohol consumption among women in the UK was 5% higher than in men Overall, at the level of other countries, the reported gender gap was much higher, tilting the balance towards the male one [46].

The subjects' ages ranged from 18 to 88 years. Most subjects, respectively 42%, were part of the age range 48-58 years. This corresponds to a Dutch study, which showed increased consumption of adults over 55 years of age, but without correlating it with death [47].

Regarding the time when the death occurred, the autumn and winter months occupied the largest share. The autumn season totalled the most subjects in all phases of intoxication.

However, the maximum number of deaths per calendar month was assigned to December.

This could be correlated with the fact that a higher level of alcohol consumption is generally reported this month, possibly due to the holiday period [48].

Another assumption would be that the apparent effect of heat sensation produced by alcohol through vasodilatation causes people to consume it more frequently when it is cold outside. The downside is that alcohol actually causes heat loss and a drop in body temperature, favouring the onset of hypothermia [6]. In the studied group there were 4 cases of hypothermia.

Regarding the time elapsed between the presumed date of death and the autopsy, most autopsies were performed one day away or on the same day as the death. Although the interval between the two data is short, it cannot be ruled out that the blood alcohol level may be affected by neogenesis. However, given that this increase, according to the literature, is only 0.15% [13], and as no analyses were collected to detect ethanol neogenesis, the process of neogenesis was not taken into account.

The background of the subjects was mostly rural areas. This is in line with data in the literature which indicate a higher frequency of episodes of consumption of high amounts of alcohol in rural areas [49].

The environment of death always corresponded to the environment of origin. Subjects living in the city died mostly in urban areas, while subjects in rural areas died frequently in rural areas.

Regarding the phases of intoxication in which the subjects were, those in rural areas predominated in all phases, except in the phase of deep intoxication where the number of subjects in both categories was identical. In both groups, the mild intoxication phase and the deep intoxication phase included the majority of the subjects.

Regarding the forensic classification of death, 60% of the subjects died in conditions of violent death, the rest by nonviolent death. Both women and men died more frequently by a violent death. In the group of those who died violently, the most common cause of death was mechanical asphyxia. Compression asphyxia, most often hanging, was more common than occlusion asphyxia, caused mainly by aspiration of food or blood.

The second place as a frequency of violent death was occupied by subjects who died from a trauma that caused fatal osteo-articular or visceral injury. Other causes of death with a violent mechanism consisted of hypothermia, carbon monoxide poisoning, or high degree burns-carbonization. Regarding the phases of intoxication, in the group of subjects who died by violent death, the phase of mild drunkenness and that of actual alcohol intoxication predominated.

Proper ethanol intoxication as a thanatology mechanism was present in approximately 9% of subjects. A similar study conducted in Slovakia indicates that fatal ethanol intoxication varied in age group from 15% to 25% of all deaths associated with high blood alcohol levels [45].In the group of subjects who died of nonviolent death, the main cause was cardiac pathology of the ischemic type, but there were also cases with death caused by cardiac pathology caused by other organic disorders such as dilated or hypertrophic cardiomyopathy.

Other causes of death presented by subjects in this category were stroke or pneumonia. The most common place of death was his home. There were also many deaths that occurred on public roads. Other categories of places where the subjects from the group died were represented by: railway routes, foreign domicile, hospital, and sheepfold and in the natural environment: forest, lake, and river.

Regarding the relationship between the phases of intoxication and the degree of representation of adipose tissue, subjects with normal adipose tissue represented predominated in all phases including in the phase of deep intoxication. In this phase, the number of subjects with poorly represented adipose tissue was equal to the number of those with well-represented adipose tissue.

The average blood alcohol level calculated for the whole batch was 1.55‰. The average blood alcohol level of female subjects was 1.48‰, very close to that of males, respectively 1.52‰. The two groups were similar in terms of average age, with the female group having an average age of 53 years, while the male group had an average age of 54 years.

Regarding the comparison of the alcohol levels of the subjects belonging to the groups of rural or urban origin, because $p>0.05$ there was no statistically significant difference between the average alcohol level of the group of urban subjects (1.51±0.70) and the average alcohol level of the rural group (1.57±0.87). However, there was a statistical difference in the ages of these subjects. The group of urban subjects had a mean age (57.84±13.59 years) significantly higher than the average age (51.64±14.78 years) of the rural group ($p<0.05$). It can be stated that rural subjects died at a younger age than urban subjects.

The observation of the statistical differences regarding the alcohol levels of the subjects who belonged to the groups of violent and non-violent death, respectively, following the processing of the statistical data, a significant p was obtained. It follows that the average blood alcohol level of the group of subjects with violent death (1.72±0.82) was significantly higher than the average blood alcohol level of the group without violent death (1.28±0.69). There was no statistically significant difference between the mean age of the violent death group (52.70±16.38 years) and the mean age (56.79±11.01 years) of the nonviolent death group. It can be said that both younger and older people are equally prone to violent deaths when under the influence of alcohol.

The differences in blood alcohol level regarding the degree of representation of adipose tissue, the Anova test was applied. There were no statistically significant differences between the blood alcohol levels of the 3 types of adipose tissue ($p>0.05$). This differs from the results obtained in the literature, where the increased body mass index is associated with lower levels of lethal alcohol [42].

In order to compare the differences in blood alcohol levels between those who had comorbidities specified in the autopsy reports and those who were not mentioned it, statistical procedures were used which showed that there was no statistically relevant difference between the average blood alcohol level of the group of subjects with present morbidities (1.72±0.82) and the mean alcohol content of the group without comorbidities (1.28±0.69) ($p>0.05$). There were, as might be predicted anyway, statistical differences in the age of the subjects.

It could be stated that the average age of the group of patients with present morbidities (58.85±10.81 years) was significantly higher than the average age (52.09±15.68 years) of the group without comorbidities ($p<0.05$). The most common comorbidities specified in the autopsy reports were cardiac and hepatic. Most of the subjects who had specified in the autopsy reports the presence of comorbidities presented at the same time cardiac and hepatic pathology.

An attempt was made to establish a statistical correlation between age and blood alcohol level, but no statistically relevant results were obtained. It could be stated that there is no statistically significant correlation between age and blood alcohol because the correlation coefficient is weak, almost zero ($r = -0.013 \sim 1.3\%$).

The average blood alcohol levels reported in the cause of death varied in the studied group.

Thus, the average blood alcohol level, excluding the cases of lethal intoxication, reached the maximum value in the group of subjects who died by mechanical asphyxia, respectively 1.67‰.

It got closed to the average concentration reported by another study, namely 1.39 ‰ [41].

The rest of the death categories showed lower values, in the case of those caused by trauma, the average blood alcohol level was 1.49‰. The group of subjects who died of hypothermia had an average blood alcohol level of 1.30‰ and those with carbon monoxide poisoning 1.05‰.

The average blood alcohol level of the subjects who had as ethanol mechanism the proper ethanol intoxication, was 2.93 g‰. The minimum value recorded in this group was 1.3‰ in a case with metabolically decompensated ethanol intoxication. The maximum blood alcohol level was 4.45‰, belonging to a 57-year-old rural male.

Regarding the average blood alcohol levels presented by the subjects who died due to pathology, they were between: 0.3‰ and 1.42‰. The highest blood alcohol level was recorded

in the group of subjects who died due to heart disease. The group of subjects who had as a thanatology mechanism the stroke, presented an average blood alcohol level of 1.2‰ and those with cirrhosis of 1‰.

The limits of the study are represented by the following: The analysed time period was short; Lack of data from previous years to compare the results obtained; Additional laboratory tests such as alcohol or neogenesis indicators were missing in most subjects, therefore it was not possible to benefit from a more accurate expression of blood ethanol concentration at the time of death; Absence of mention of ethanol consumption history in most cases; Lack of accurate specification in the autopsy reports of the level of causation between blood alcohol and cause of death.

Over time, alcohol consumption has been the subject of multiple studies, which have focused on the negative effects it produces in the context of excessive ingestion. However, there are notions that are not yet fully elucidated and that arouse curiosity in conducting scientific studies for this purpose. Despite alarming results and attempts to discourage alcohol consumption, this phenomenon persists and is reflected in the health of the population and the manner in which deaths occur [50].

Due to the limitations of the study, the present results cannot be extrapolated to the general population and therefore more extensive and detailed research should be conducted. However, in Cluj County, prevention strategies could be applied especially in the group of male subjects, middle age and rural origin.

4. Conclusions

As a result of the evaluation of the data extracted from the autopsy reports, a series of results were obtained with the help of tables, graphs and statistical tests, which in turn were exposed and analysed. Based on these, the following can be concluded:

- Male subjects who died of ethanol intoxication were much in higher number than female subjects, but the mean blood alcohol levels of the two groups were similar.
- The age most prone to deaths associated with alcohol consumption is between 48-58 years, which could suggest that the implementation of health and prophylaxis interventions should be dedicated to this population.
- Deaths were more frequent in rural areas and in the cold months.
- Most male subjects were in the phase of mild intoxication but with little difference from those with actual intoxication.
- Most deaths had violent and occurred with statistically significantly higher blood alcohol levels than deaths produced in nonviolent conditions.
- Violent deaths were most often caused by mechanical asphyxia and nonviolent deaths were caused by cardiac pathology.
- The average blood alcohol level of the group was 1.55 g ‰.

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Silver Nanoparticles and Their Antiviral Action on Hepatitis B Virus

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Abstract

While hepatitis B virus (HBV) infection continues to spread globally, the therapies currently used are relatively few. Thus, a new approach is needed, and nanotechnologies seem to be the future in therapy. More and more studies are focusing on the antibacterial and antiviral action of nanoparticles. Therefore, this study aims to test the antiviral action of silver nanoparticles on HBV using *in vitro* cell cultures. Future results of the study may provide new insights into the use of nanoparticles as treatment of HBV infection.

Keywords: nanoparticles, Hepatitis B virus, nanotechnologies'

1. Introduction

Hepatitis B virus (HBV) infection is a global health problem, being the most common chronic viral infection. It has been estimated that over 350 million people are chronic carriers of HBV. Up to 40% of men and 15% of women with chronic infection die from liver cirrhosis or hepatocellular carcinoma [1].

In order to study this virus, but also to develop effective therapies, it is necessary to use in vitro models. Initially, these were based on the use of hepatoma-derived cell lines and virally transfected or virally transduced DNA genomes. Later systems based on primary hepatocytes or stem cell-derived hepatocytes were created [2].

In this study we use the HepG2 cell line. These cells are immortal, derived from the hepatoma and are used as surrogates of hepatocytes even if they only partially mimic their physiological functions. Even if they are not susceptible to HBV infection because they cannot mediate viral internalization, transfection of these cells with HBV DNA activates the production of HBV particles [2, 3].

Although 25 drugs have been developed and approved for the treatment of HIV infection, only seven compounds are available for the treatment of HBV infection: interferon α, pegylated interferon α, entecavir, lamivudine, tenofovir, adefovir, telbivudine [4]. The main target of synthetic nucleotide or nucleoside analogues is HBV DNA polymerase. Therapy with a combination of drugs is used to treat HIV infection. In the future, the same strategy could be adopted to treat HBV infection [5].

Nanotechnologies are a new approach of the hepatitis B virus infection. They can lead to the development of effective treatment and perhaps even a first step towards the cure of chronic HBV-associated hepatitis.

Although the use of metal nanoparticles in catalysis and optoelectronic devices has been extensively studied [6], there are relatively few studies regarding their biological properties and potential therapeutic applications [7].

From this point of view, the anti-microbial activity of silver nanoparticles received the most attention, proteomics and biochemistry studies being performed, which aim their antibacterial and antifungal activity [8].

Lu and his colleagues studied the inhibitory action of silver nanoparticles with diameters of 10 nm (Ag10N) and 50 nm (Ag50N) on HBV. They used the HepAD38 cell line, which secretes HBV-like particles and expresses elevated levels of HBV DNA in the supernatant. Following their study, it was observed that the maximum anti-viral activity is obtained by using Ag10N at a concentration of 5μM for 96 hours. An inhibition of over 50% and a cell viability of over 95% were observed [9].

Silver nanoparticles have a limited effect on circular covalently closed DNA (cccDNA) levels, but can inhibit HBV RNA formation. The reduction in HBV RNA levels suggests that its transcription from the cccDNA or integrated viral genome is prevented, which may lead to inhibition of relaxed circular DNA (rcDNA) formation as pregenomic RNA (pgRNA) serves as a template for reverse transcription. Most rcDNA molecules are enveloped and exported from the cell, but a few are transported back to the nucleus where they are converted to cccDNA to keep the intranuclear pool stable [10]. Thus, inhibition of HBV rcDNA production has a greater influence on the number of extracellular virions than on cccDNA levels [11].

2. Case study methodology

Cell culture

The HepG2 cell line was maintained in culture in 10cm diameter Petri dishes. 50μg/mL of collagen was previously placed in the plates and left for 30 minutes to form a thin layer.

Subsequently, the excess collagen was recovered and the plates were washed three times with phosphate-buffer saline (PBS). The collagen layer helps the cells to adhere to the surface of the Petri dish. For the cellular environment, Eagle' Minimum Essential Medium (EMEM) supplemented with 10% Fetal Bovine Serum (FBS) and a mixture of antibiotics was used.

Prior to the start of the experiments, the cell culture was subjected to several cell passage procedures. Thus, when the cells reach a confluence of about 90%, they are transferred to continue their cell cycle, because these cells grow in a single layer. The cellular medium, PBS and trypsin must be heated to 37 °C.

The day before the start of the experiment, the cells that reached a confluence of 80% were transferred to the plate with 24 wells, so that in each well they were at a confluence of 20%.

The next day, considered day 0 of the experiment, the cells were infected with the hepatitis B virus for 24 hours. After 24 hours, the cells are washed with PBS and fresh cell medium is placed in each well. On day 4, the procedure of washing and replacing the cellular medium is repeated. On day 8 post-infection, treatment with silver nanoparticles is initiated.

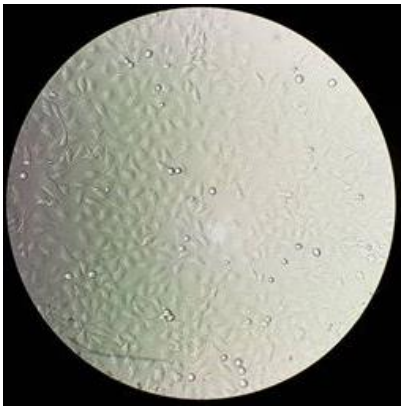

Fig. 1. HepG2 cell line in culture visualized with a 20x optical microscope

Transfection

After the HepG2 cells were seeded in a 24-well plate (10%/well) for 24 h, we proceed to add in every well polyethylene glycol (PEG 100mg/mL) and HBV virions with a multiplicity of infection (MOI) of 500. We incubate the cells for 24 h and then we wash the wells with PBS and we add fresh medium.

Determination of drug treatment scheme

To determine the optimal concentration of the treatment, silver nanoparticles will be placed in the wells in increasing concentrations. The nanoparticles will also be administered at different time periods to establish a treatment scheme. At this stage, cell viability will be evaluated using optical microscopy methods, and HBsAg will be quantified.

Antiviral assay

Once the treatment scheme is established, it will be applied to new wells with infected cells.

Every three days, the culture medium and some of the cells from each well will be harvested and stored in cryotubes at -70 °C. Subsequently, the viral load, HBsAg and viral cccDNA will be determined from the samples taken.

Expected results

Following the experiments performed in triplicate and the determination of the three parameters (HBsAg, viral load and cccDNA), but also the centralization of the obtained data, we expect that we will obtain decreasing curves. Thus, the effectiveness of the treatment will be clearly observed. At the end of the experiment, the curves should ideally stabilize at zero.

Also, a well-developed treatment scheme should help us maintain an increased cell viability throughout the experiment.

3. Conclusion

Although HBV infection is widespread, its cure seems difficult to achieve at this time.

However, by using nanotechnologies it is possible to get better and better results. Thus, the experiments of this study aim to solve a current problem with an innovative approach.

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Maladaptive Cognitive Schemas and Decision Making

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Abstract

Maladaptive cognitive schemas are cognitive and emotional patters build during childhood.

These information storages are responsible for self-defeating, emotional and all cognitive operations and thus even in decision making actions. This paper presents an analysis of cognitive schemas from different psychological perspectives related to the psychological picture of cognition rigidity and dogmatisation of the act of murder.

Keywords: maladaptive cognitive schemas, emotional schemas, decision making, murder

1. Introduction

Maladaptive cognitive schemas are responsible for the calculation, representation, abstractisation, recalling and assessment of information, and they are involved in self-monitoring and inhibition or in directing a decision maker's actions. This chapter will approach cognitive schemas from the perspective of cognitive psychology [1], the paradigm of cognitive-behavioural psychotherapy [2], as well as from the perspective of economic psychology [3].

These approaches have robust theoretical-experimental models in predictably explaining the human mind with regard to the representative and knowledge organisation, assisted by cognitive tools. These particular theories were selected in order to outline the psychopathological clinical picture of cognition rigidity and dogmatisation in the act of murder.

From the point of view of cognitive psychology, Dawn M. McBride M. D. and Cutting C. J [4] define a cognitive schema as being a general mental structure of related information and/or concepts, which are organised and adapted to the realities of each individual's life. Cognitive schemas are very similar to semantic networks, and are often more task oriented. Schemas have several characteristics which ensure wide flexibility in their use. They can include categories: a criminal schema includes a sub-schema for car theft, another sub-schema for informational crime and many other associated sub-activated schemas. Schemas contain general, typical acts which can slightly vary from one example to the next, depending on their degree of abstractisation. For instance, a schema for Catholic religion is much more abstract than a schema for drug use or even a schema for an emotional impostor.

According to Kellogg T. R. [5], schemas can also refer to categories of relationships. Some of these data include links between the following relational characteristics: concepts (for example, the link between bicycles and motorcycles); attributes within concepts (for instance, an individual's height or weight); attributes within associated concepts (such as the somatic changes in men and women); particular concepts and contexts (extra-terrestrial and universe); specific concepts and general basic knowledge (for example, concepts on the leader of an organised crime group and general knowledge on the criminal group and its history).

A major problem with regard to cognitive schemas occurs when biased information develops mental or personality disorders, when structured data blocks become a primer for anomalous and/or irrational decisions which may lead to murder. This was the reason why the paradigms

of cognitive-behavioural psychotherapy [6] and of economic psychology [7] were used in order to conceptualise the psychopathology of a decision maker involved in murder.

Aaron T. Beck [8] was inspired by the cognitive models of developmental psychology, such as Piaget's theory related to adaptation and assimilation in forming schemas, by George Kelly's work on thought constructs, as well as by Bowlby's attachment theory, which forms the grounds of cognitive-behavioural psychotherapy and defines cognitive schemas as structures which integrate and give meaning to a decision maker's life events, their content being personal relationships of impersonal concrete (a knife) or abstract (penitentiary) categories. The activation of antisocial psychopathological schemas can replace and probably inhibits other schemas which may be more adaptive or more functional, so that a systemic distortion is produced in the decision-making process. They become syndromes, but with the amendment of good functioning in information processing.

Beck [9] emphasises in his fundamental book on crime, *The Cognitive Basis of Anger, Hostility and Violence*, that negative cognitive schemas in a criminal are classified in two main categories: central ideas associated with helplessness and central ideas associated with non-acceptance/undeserved love. Some murderers have psychopathological schemas belonging to one category, while others manifest central ideas belonging to both categories. Most individuals who have committed first degree murder have developed psychopathological central beliefs which can mediate a decision leading to crime, even murder.

Judith S. Beck [10] brings to the table a new formula regarding maladaptive schemas, underlining the fact that they are composed of *central beliefs, intermediate beliefs and automatic beliefs*. According to the theoretical-experimental model of Judith S. Beck, central beliefs are fundamental cognitions regarding the self, others and one's personal world in an antisocial sense, while intermediate beliefs, mediated by antisocial rules, assumptions and attitudes, develop the central psychopathological belief adjusting automatic cognitions in order to confirm and select information which confirms the decision maker's central belief, rationalising murder without remorse. The cognitive model could be translated by the following sentence: central belief – *I can kill, hurt, insult whoever I want;* intermediate belief – *if I do not kill, hurt or insult whoever I want, I might be taken for a fool;* automatic belief – *I can kill and hurt, I can get whatever I want by force* etc.

Judith S. Beck [11] also claims that at the root of all conflicts, violence and problems caused or initiated by a decision maker with such maladaptive cognitions lie these central, intermediate and automatic thinking patterns. The ideas of Seeler L., Freeman A., DiGiuseppe R. and Mitchell D. [12] also bring into discussion the cognitive model validated and adapted by Judith S. Beck with regard to the central, intermediate and automatic beliefs of a decision maker who has committed murder. The authors have argued that there are correlations between psychopathological personality traits and a maladaptive central, intermediate and automatic pattern. This model also has limitations, due to the fact that no significant studies have been carried out on penitentiary and non-penitentiary populations, in order to outline and strongly discriminate central and intermediate beliefs in individuals who have committed murder from those of individuals who have not.

Keulen-de Vos M. E. Bernstein D. P. and Arntz A. [13] bring a new theoretical-experimental model from the field of forensic medicine, and propose four modes in maladaptive schemas in decision makers who commit murder or are aggressive or violent. The first, named the *protector-irritant mode*, is an emotional state of self-regulated fury or hostility, a "wall of anger" which serves in keeping others at a distance. The second is *the detached mode*, underlining a state of cold, merciless aggression. The emphasis is on eliminating a threat, obstacle or enemy, but this takes places in a reckless, unfeeling and often unplanned manner.

The subtype of the detached mode is the paranoid ideation of searching for and consequently controlling a source of danger or humiliation, usually by localising and uncovering a hidden or

imaginary threat. The *double crossing or manipulative mode* refers to a psychopathological style which involves trickery, lying, manipulation of others, for the purpose of reaching a specific goal, such as avoiding punishment or victimising others for a certain type of gain (such as money, attention or sex). The *omnipotent or perfectionist* mode involves excessive control and focusing one's attention on a real or imaginary threat or danger. In the obsessive-compulsive subtype, also known as omnipotent and perfectionist, the individual attempts to exert control by using order, repetition or maladaptive rituals. Other similar studies [14, 15, 16] abound in useful elements for generating a clinical picture of the maladaptive schemas of a decision maker with psychopathological personality traits, and this paradigm has the highest empiric validity, as well as good predictability.

2. Early Maladaptive Cognitive Schemas

Young E. J., Klosko S. J. and Weishaar E. M. [17] define early maladaptive cognitive schemas as a generalised pattern, composed of experiences, feelings, thoughts or psycho-somatisations regarding oneself, others and the personal and behavioural world throughout the years, affecting all the functional areas of an individual. The origins of early maladaptive cognitive schemas are a consequence of basic emotional deprivation. The theoretical-experimental model of Young E. J. and his collaborators [18] has postulated five individual basic emotional needs: *secure attachment towards others, personal autonomy, positive abilities and emotions of human identity, assertive development and fundamental feelings, spontaneity and entertainment, rational delimitation and behavioural self-regulation.* These are universal motivations, and the development of cognitive schemas is mediated by the four types of early experience in the decision maker's life: detrimental frustration of needs, trauma/victimisation, deprivation in developing autonomy and selective interiorization or selective identification with significant persons. The duality of the temperamental components with which an individual is born can also contribute to the development of early maladaptive cognitive schemas, for instance: lability-non-reactivity, dysthymia – maniacal optimism, neuroticism – schizoid, obsession – distraction, passivity – activity, irritability – playfulness, timidity – extraversion.

Young E. J. And his colleagues [19] validated 18 early maladaptive cognitive schemas, structured into five categories which are representative for unreached emotional goals in an individual. They are: Disconnection and Rejection, Impaired Autonomy and Performance, Impaired Limits, Other-directedness, Over vigilance and Inhibition. Individuals with typical psychopathological origins from the field of Separation and Rejection manifest major lability (schema: abandonment/instability), feel abused (schema: mistrust/abuse), are glacial (schema: emotional deprivation), feel criticised or judged (schema: defectiveness/shame) and are isolated from those around them (schema: social isolation/alienation).

Most murderers, individuals who are part of criminal groups, terrorists, rapists and vandals get high scores in the field called Separation and Rejection [20]. Those who belong to the field called Impaired Autonomy and Performance have unrealistic expectations regarding themselves and others, which interfere with their distorted perception of their social and intellectual abilities, so that they isolate and psychopathologically distance themselves from those around. The early maladaptive schemas (dependence/incompetence, vulnerability to harm or illness, enmeshment/underdeveloped self and failure) which are part of the Impaired Autonomy and Performance field are developed in childhood because of parents who were overprotective or who abandoned their offspring.

Most individuals who commit robbery, street fighting, theft and prostitution fall into this psychopathological field [21]. The field named Impaired Limits refers to the psychopathological difficulty in respecting the rights of others, in cooperating with others and in reaching personal goals in society, family and intellectual life. Individuals who manifest

these early maladaptive schemas (feelings of entitlement/grandiosity, insufficient self-control/self-discipline) come from families where social values, dignity and respect for others were not promoted, and where they received no guidance or supervision related to respecting rules and discipline, in order to adapt to a normal society. Individuals with such maladaptive schemas have developed provocative opposition and antisocial behaviour, and get involved in street fighting, human trafficking and rape. [21].

Another group of schemas reunited under the field labelled Other-directedness was validated by Young E. J. and his team [22], arguing that individuals with a psychopathological focus on the emotions, preferences and reactions of others to the detriment of their own needs may develop rigid, dogmatic and absolutist expectations to receive approval and emotional support, as well as an acute need to not be deserted. These decision makers come from families where socio-intellectual and material status was valued more than emotional interests and needs. Many of those who develop the cognitive schema of need subjugation suppress their own preferences and decisions, and those who are emotionally subjugated prefer suppressing their feelings or frustrations for fear of being rejected or abandoned by others.

Therefore, the cognitive schema based on self-sacrifice produces an excessive focus on voluntarily meeting the preferences of others to the detriment of own gratification, while the cognitive schema related to approval and recognition seeking refers to individuals who beg for the approval, attention and recognition of others in order to facilitate social integration, to the detriment of the development of a strong, authentic self. These early maladaptive cognitive schemas may give rise to decisions leading to offences such as sadomasochism, complicity to murder, robbery and vandalism [23].

The last field, Overvigilance and Inhibition, refers to the suppression of spontaneous emotions, frustrations and choices or to respecting rigid internal values and expectations related to performance and ethical behaviour, often to the detriment of self-satisfaction in relation to others. Cognitive schemas which characterise the field are: negativity/pessimism (orientation towards the negative aspects of oneself and others on all fields, be they professional, social or intimate), emotional inhibition (fury, aggression, positive-negative impulses, neuroticism, placing undue emphasis on rationality), unrealistic standards/hypercriticalness (psychopathological perfectionism, rigid and absolutist rules and the needs to do numerous things at once) and punitivity (the perception that people should be punished, being intolerant, punitive and furious). Individuals who manifest these early maladaptive cognitive schemas are sociopaths, serial killers, and, on the background of borderline personality disorder, may kill in cold blood [24].

3. Maladaptive Emotional Schemas

Leahy L. R. [25], inspired by the social-cognitive, dialectic models of acceptance and commitment, mentalisation, as well as other approaches in neuroscience, validates the paradigm of emotional schemas or psychotherapy centred on emotional schemas, defining the maladaptive schemas as being psychopathological emotional patterns identified in individuals who have mental, personality or relating disorders. Emotional schemas are assessments, interpretations, attributions and other cognitive evaluations of emotions, as well as the strategies of emotional regulation which may or may not help an individual.

This paradigm of Leahy reflects multiple influences from the cognitive-behavioural theory of Aaron T. Beck [26], the metacognitive theory of Adrian Wells [27], Leslie S. Greenberg' emotion-centred psychotherapy [28], the mindfulness theory of Jon Kabat-Zinn[29], John M. Gottman's emotional attachment model [30] and from the Dialectical Behaviour Therapy model of Marsha M. Linehan [31], and refers to his model as representing a theory on emotion, showing a decision maker's reactivity when he himself or others experience or manifest an

emotion. It was also Leahy who proposed fourteen dimensions (*duration*, *control*, *comprehension*, *consensus*, *guilt/shame*, *rationalisation*, *simplistic perception of emotions*, *values*, *expression*, *validation*, *acceptance*, *blame*, *numbness and rumination*) of maladaptive emotional schemas in individuals, which represent conceptualisations and assessments of feelings, as well as reactivity to a certain emotion.

The figure below shows the conceptual model validated by Leahy L. R. regarding emotional schemas and/or psychotherapy centred on emotional schemas. Depending on adaptive or maladaptive emotional perceptions, a decision maker can develop maladaptive emotional schemas.

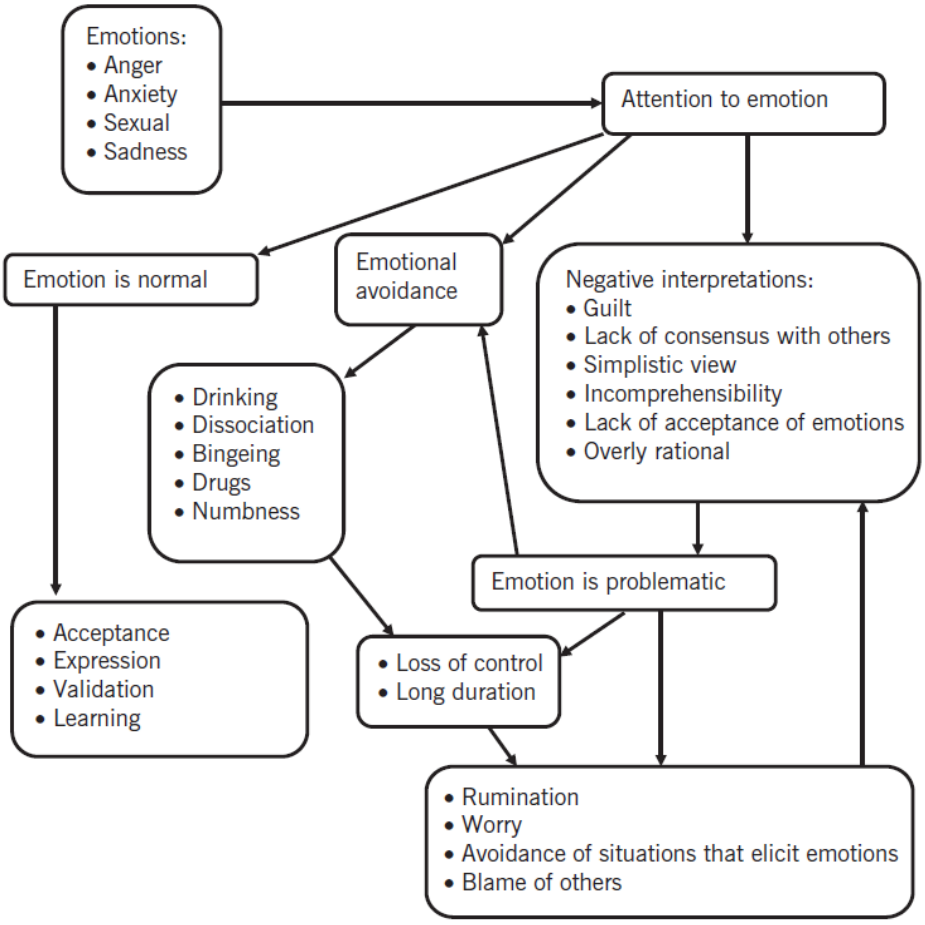

Fig. 3.1 A model of emotional schemas. Leahy L. R. 2015 [25]

The dimension related to the *duration* of emotional schemas refers to a distorted perception of the time or duration of emotional distress, which persists and produces suffering recurrently.

This scheme includes individuals with addictions, abuse and murder, due to false perceptions and due to the rationalisation of the antisocial behaviours manifested [32].

The dimension related to *control* refers to the lack of emotional control, causing fear and anxiety for those manifesting racism, xenophobia, anti-Semitism, robbery, attempted murder or murder, due to the criminal and social consequences, as well as in relation to their victims [33].

The dimension related to the *comprehensibility* of maladaptive emotional schemas can also be seen in individuals who commit murder, who believe that their feelings make no sense and are often confused in their emotions. The fact that they experience antisocial acts is due to their limited emotional perceptions, which are difficult to comprehend with regard to the meaning of life and those around [34].

Consensus, as a dimension of maladaptive emotional schemas in certain offenders, refers to a belief that they are the only ones facing certain emotions, thus ending up developing the cognition of being abnormal or disturbed. This is the reason why such individuals are confused and non-participative in forensic psychiatric evaluations and tests, so that certain experts reach a psychological or psychiatric under- or over- diagnosis [35]. Another dimension of the scheme is *guilt and/or shame*, which, together with the *rationality* dimension, generates the belief that it is not worth having feelings, so as not to develop unhelpful emotions. The rationalisation of this emotional dimension is encountered in serial killers, terrorists, dictators, psychopaths and sociopaths, due to their developmental ability to suppress emotions of shame or guilt, so as not to interfere with their antisocial actions [36].

The *simplistic perception of emotions*, as a dimension of emotional schema, reflects a dichotomised, all-or-nothing perception of experience, due to a rigid and absolutist evaluation of emotions in relation to oneself and to others. The same thing can be said about the emotional *expression* dimension, mentioning the conviction that individuals can express their feelings, being able to manifest them in the presence of others, revealing the range of emotions they have about themselves and others. Often, individuals in this category have addictions and consequently commit murder or attempted murder [37].

The emotional schema dimension named *invalidation* refers to the situation in which an individual believes that nobody deserves to have emotional receptivity or emotional support, as well as that others do not care about their feelings. This psychopathological emotional dimension occurs in psychopaths, sociopaths and serial killers [38].

The other dimensions of emotional schemas are *acceptance*, underlining intense experience of emotions; *blame*, meaning punishing others for one's own negative emotions; *numbness* as a schizoid emotional dimension in relation to others and *rumination*, which, as an emotional dimension of a schema, shows a form of psychopathological meditation on negative events and experiences.

Bar-On R. [39] and his team have identified five series of components of emotional schemas, naming them: *intrapersonal* – self-respect, emotional self-awareness, assertiveness, independence, self-actualisation; *interpersonal* – empathy, social responsibility, interpersonal relation; *adaptability* – testing reality, flexibility, problem solving; *stress management* – tolerance to stress, impulse control; *general state*– optimism and happiness. It has been proven that individuals who obtain low scores in these series of behaviours may develop dysfunctional emotional schemas or maladaptive emotional patterns.

Bar-On R. [40] goes much further, uniting the five series of components under the term *emotional intelligence*, conceptualising and validating this model. He claimed that emotional intelligence refers to the dimensions of feelings, described above, for the daily functioning of an individual and for understanding oneself and others, with human interaction, with adaptation to daily reality and with strategies for managing the latter, for the purpose of adapting to one's environment and to society.

A study applied on a group of individuals with aggressive behaviour in the workplace and on individuals who had been imprisoned for armed robbery revealed very low scores (under 30t) in the Emotional Quotient Inventory (EQI) test, when evaluating the components of assertiveness, empathy, self-respect, social responsibility, optimism and happiness [40], [41].

Covington S. S. [42] starts from Cacioppo's somatic-visceral emotional theory regarding emotions triggered by cognitive schemas and by somatic-visceral changes, and proposes alterations in their self-regulation in the case of individuals who are victims of abuse and other offences. For instance, Cacioppo's theory brings into discussion the fact that an individual, depending on the evoking stimulus, may have a somatic-visceral response (activation of a specific emotion), somatic-visceral association (non-ambiguous), cognitive operation

(recognising emotional patterns), and depending on these, the individual experiences an emotion in a negative or positive manner.

Another approach is that in the field of economic psychology, underlining that immediate emotion, such as hunger or thirst and sensations such as pain may guide behaviour depending on psychopathological intensity of experience [43]. In fact, immediate (visceral) emotions which may develop a maladaptive emotional schema are nothing else than psychopathological expectations or needs.

Murray A. M. [44] described human need as being a reactive power in a certain way or circumstance. Individuals are characterised by material or spiritual deprivation, by dissatisfaction, becoming a state in the human psyche. These needs can be either primary or visceral, being organically based, or secondary or psychological, grounded on mixed, organic and psychological needs.

4. Conclusions

Therefore, according to Delcea C, Enache A, Stanciu C. [44], human needs can develop and maintain a maladaptive emotional schema in the context in which they become states of mental tension, guiding behaviour, being stable in time and having a hierarchy dependant on the priorities, quality and intensity of visceral needs and interacting amongst themselves.

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Dropout in Psychotherapy Training. Case Study

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Abstract

Dropout is an issue studied in education in general. Training in psychology doesn't escape issues related to education, thus dropout in training and supervision periods for the future independent psychotherapist, psychologist should also be analysed. For this reason, a dropout study was applied to an association from Romania, specialized in training and supervision programs for future psychologists and psychotherapists. The results show that half of the number of people entering training actually graduate and become successful practitioners.

Keywords: dropout, psychotherapy training, clinical supervision programs, trainer, supervisor

1. Introduction

Dropout is an issue much discussed by studies in the education of children and adolescents, but also of students [1], [2], [3], [4]. But if one focuses on the field of psychotherapy, this situation could also be analysed, from this point of view, also in the university environment, students giving up education [5], [6], [7], and [8]. In psychology, dropout is studied in terms of the patient, the client who gives up psychotherapy, not in the situation of the psychologist, the psychotherapist who gives up his own professional training.

Training and supervision programs are also subject to different studies in terms of learning and procedures [9], in terms of tools used [10, 11] and the feelings and emotions of group members [12, 13], but the phenomenon of dropout in these situations is different. We are talking about training programs in psychotherapy, programs that in Romania take place through various institutes, associations, organisations, after graduating university studies, as part of the continuous professional training and approved by a national forum, but also by international forums that offer such programs

2. Study Scope and Objective

The scope of the proposed study is to identify some causes of dropout in the case of training groups in psychotherapy in Romania, within an association, provider of training programs, and to underline some measures that can help reduce this phenomenon.

Training institutes and associations are interested in the most appropriate methods to achieve their mission, that of training specialists in psychotherapy. The beginning of a practitioner in psychotherapy is not easy, psychotherapy being a liberal profession.

Psychology students, from the first years of study, focus on one psychology specialty, clinical psychology and psychotherapy being the most chosen ones. The Master's programs proposed by the universities in Romania in the field of clinical psychology and psychotherapy establish their study programs in collaboration with institutes or training associations in psychotherapy or develop within universities departments specialized in training and

supervision in psychotherapy. Implicitly, there is a competition between trainers, between universities and training providers, as well as between different training providers.

Graduates select training courses according to several criteria, the most important of which being the familiarization with therapeutic orientations during their studies, along with criteria such as: preferences, personality style, renowned trainers, trend, etc.

The offer of training associations is also varied and determined by: how and when did the respective orientation enter the country or the region? How well-known are trainers and supervisors, what recognition and references do they have as practitioners? What is the quality of the training programs offered? What interactions do the trainers have with the potential trainees (are they their professors, are they mediatised, where did they graduate courses from trainers and supervisors, etc.?).

Therefore, the announcement on the start of a new training course in psychotherapy attracts potential learners and determines them to analyse offers, to be interested in the respective therapeutic orientation. An important element in the selection of a training program in psychotherapy is the course duration.

There are different training courses on the market, in different therapeutic orientations with different study duration, from 4 years to 7/8 years. The time factor is thus an important element in the selection of a training program, even if the respective therapeutic orientation is not the one preferred by the future trainee. The trainee's preference may be another therapeutic orientation, but with has a longer training program.

A less discussed and dissected aspect is the quality of the training courses, programs offered.

Obviously, each association or university, as a training program provider in psychotherapy or psychology counsellor has to keep a high level of quality.

But what does the quality of training courses offer? What are the ingredients that make a provider of training in clinical psychology/psychotherapy/psychology counselling different from another provider?

The answers are difficult to identify and maybe only the trainers' practice and experience provide pertinent answers and obviously the experience of course graduates who practice, the reputation outlined and preserved, the fact that the trainers are contacted by other clients, future students, and future trainees.

Thus, at the input we observe the registered trainers and trainees, and at the output, the remaining trainees, who will carry on through their actions, the reputation of the training organization. In addition, we can add, when it comes to trainers, the quality of their training and personal therapy (where, when, with whom they performed the training and supervision; how much practice they have with clients/patients). A trainer/supervisor accumulates his/her experience and expertise by professionally investing time, courses and hours in the office; the theoretical and practical information acquisition being inseparable.

Psychotherapy/psychological counselling is taught through the clinical practice, found at the base of training as a specialist. However, clinical practice without intellectual and methodological skills is not enough for a trainer (supervisor). There are many trainers with a lot of clinical experience, but who do not have the skills/abilities to transmit knowledge, who lack pedagogical tact; and for the theoretical part even more, they did not develop that professional mastery expressed by the ease of linking and explaining difficult topics through references to clinical practice.

With each output of a series of trainees, the trainers gain the experience that will be stored in the professional background and that will be used in the interaction with the trainees of future series.

Identifying the causes that lead to the trainees' dropout, would help to optimize and take measures in the management of training providers in psychotherapy.

It is important for trainers to encourage trainees when they get stuck, to overcome obstacles and move on. However, is the trainer allowed to encourage a trainee who seems to be overwhelmed by difficulties or who tries to circumvent the quality criteria of the training program?

Obviously, in the first situation, an option would be the trainee's individual therapy (in fact, in certain training programs in the country this is mandatory), discussing the issues and solving them with the trainee, giving up courses for a limited period of time and resuming them after a while. (From experience we can say that all those who gave up, with the mention that they will resume the courses, did not do so. Only one such exception was registered, one person registered in the training program).

In the second situation appears when the quality criteria of the training program are circumvented by the trainee, through the periodic absence of several hours of each course module, testing the limits of the trainer or trainers, repeated delays in the delivery of the obligatory homework's, etc. I draw attention to ... the input, the way in which the admission interview was conducted and especially, what decision will be taken in connection with the continuation of the courses, which conditions will be mentioned for that trainee. In this situation, the following are useful:

- Establishing a training contract, signed by the trainee from the very beginning, which also specifies the measures taken in case of the situations mentioned above;
- Clear, punctual establishment of the rights and obligations of the trainee, but also of the rights and obligations of the trainers;
- Periodic meetings of trainers and supervisors, within the training program to: identify issues that may arise and how they can be addressed; identifying solutions to issues within the training program; the design of a strategy to approach the issue that frequently appears in several trainers, with reference to a certain trainee or program, etc.

The attention of the present study is directed to an association providing professional training in integrative psychotherapy, the association that started the training activity in 2012 and organized different groups, series of trainees in different centres in the country.

Thus, the objectives are:

Objective 1 Carrying out an x-ray of the period 2012-2020 regarding the dropout situation of trainees enrolled in the groups of one of the trainers and supervisors of the association.

Objective 2 Identify possible causes related to the trainer's style and the trainees in the dropout situation.

3. Methodology

3.1 Objective 1 Carrying out an x-ray of the period 2012-2020 regarding the dropout situation of trainees enrolled in the groups of one of the trainers and supervisors of the association

The training association started the courses in 2012, when it also obtained national and international accreditations and approvals. Since 2012, every year, series of training in integrative psychotherapy orientation have been started, in several cities, targeting in time two big cities: the capital and another city, a strong university centre in the west of the country.

However, during all this period, courses were started in different cities in the country which include: Resita, Hunedoara, Deva, Arad, Bucharest and Sibiu. The trainees' dropout situation, from all series started in these cities is presented in Table 3.1 below.

Table 3.1 Dropout situation during 2012-2020

Years	Resita	Hunedoara	Deva	Arad	Timisoara	Bucharest	Sibiu	Total	Percentage
2012	5*	5*	-	-	-	-	-	10	14,49%
2013	2*	-	2	-	7*	1*	-	12	17,39%
2014	-	-	3	-	4*	-	-	7	10,14%
2015	4	-	-	-	-	2*	3	9	13,04%
2016	-	-	-	4	-	-	-	4	5,80%
2017	-	-	-	4	3	6	-	13	18,84%
2018	3	-	-	2	7	2	-	14	20,30%
2019	-	-	-	-	0	0	-	0	0
							Total	69	100%

The analysis of Table 3.1 shows that in 2012, the first series of training in integrative psychotherapy began in two cities located at a distance of about 140 km, two cities former steel centres, but at present impoverished. However, two series were started, with an identical dropout rate. From the analysis of the files found in the association archive, the courses were abandoned (in both locations) after one, two, maximum 5 meetings with the trainer. We also registered cases in which the courses were even abandoned after 2 and even 3 years of training in psychotherapy.

As an observation we can mention, that if in the 2012 series in the two cities, 10 cases of abandonment were registered, those that were later confirmed as independent psychotherapists are the same number: 10!

Another observation, for 2013, on the series from Resita, 2 dropouts were registered, but this is also a result of the small number of trainees. At the beginning, a series usually starts with a number of 7-10 trainees, and if 2 people withdraw, the dynamics of the group can no longer be maintained, a situation that can be solved by adding new trainees to the previously formed group, after prior discussions with initial group members and their consent. Thus, from the perspective of the training association, the trainees who started in 2012 and 2013 graduated in 2018. However, out of the 12 graduates, only 5 submitted the documents to the higher forum to become independent psychotherapists (see table 3.1., in 2012, 5 dropouts), and another 2 trainees, currently renewed the supervision contracts with the supervisor, because they have not submitted their documents to the national forum for approval since 2018, even if they exercised their profession in individual psychology offices (see Table 3.1 for Resita, year 2013).

Another interesting aspect, regarding the city of Hunedoara, in 2012, 5 cases of abandonment were registered, and in 2018, 5 people were confirmed as independent psychotherapists.

The duration of the training and supervision courses, according to the program of the training association is of minimum 5 years, but in order to pass from one competence to another, from the training program to the supervision one and from supervision to being independent, a maximum of one more year is added.

During 2016-2017, the activity of the higher professional forum was seriously disrupted and resumed previously. So, another year was added to the training program ... So, the 2012 series became independent therapists only in 2018, or even in 2019. A real marathon of professional ambition was demanded. It is found that, although all the criteria of the training association are met, the final exams being finalized, the trainees/ supervises practicing the profession, some of the graduates still fail to prepare a final file to register as independent psychotherapists.

The analysis of the city of Timisoara (a strong university centre), from the dropout perspective for the years 2013-2014, shows a total of 11 people (7 in 2013 and 4 in 2014).

Corroborating with the situation of supervisees from 2020: the trainees from the 2013 and 2014 series were also included and we currently have 9 supervisees (by reuniting the 2013-2014 series), who are approaching the end of the supervision program, having only to participate in the final exams. Only 9 colleagues remained in the group, because 2 colleagues were transferred to another colleague supervisor, so we can calculate 9 + 2 = 11 people...

In conclusion, 11 colleagues dropped out of the 2013-2014 series, leaving 11 in supervision, of which 9 are already preparing to become independent psychotherapists. To better illustrate the situation, Table 3.2 presents the supervisees' situation in 2020. Currently there are two supervision groups, in the two major supervision centres analysed: Timisoara and Bucharest.

Table 3.2 Number of supervisees in 2020

Training centre	Male	Female	Total
Timisoara	3	6	9
Bucharest	5	10	15
Total	8 (33,33%)	16 (66,66%)	24

Penetration on the Bucharest training market was quite difficult, and the groups were small in number. The activity in the city of Bucharest started with a small group, with a number of supervisees, who came from other associations of the same psychotherapeutic orientation. 7 colleagues graduated, who have their competence recognized even in the national forum, and 2 colleagues have to take the final exam to become independent psychotherapists, and afterwards recognize their competence at the level of the national forum. Thus, we calculate a number of 9 independent psychotherapists (7 officially and 2 meet the criteria).

From the analysis of table 3.1, for the city of Bucharest, for the period 2013-2017, we observe a number of 9 dropouts. The situation seems to be similar to the other two training centres. Table 3.3 presents the trainees' situation in 2020.

Table 3.3 The trainees' number in 2020

Training groups	Male	Female	Total	
Timisoara 1	4	10	14	26
Timisoara 2	3	9	12	
Arad 1	-	10	10	17
Arad 2	2	5	7	
Bucharest	2	10	12	12
Total	11 (20%)	44 (80%)	55	

From the analysis of table 3.3 we can observe that, after 8 years, the efforts of training and supervision courses gained shape, and training groups exist in two very close cities: Timisoara and Arad, with a number of trainees at the maximum limit of schooling.

The fact that in the Timisoara training centre, the number of trainees increased, reflects the conquest of the training market, even if there are other training programs in psychotherapy in the city and another colleague has an association in the area and also runs training courses.

Table 3.4 presents the numerical situation of all trainees enrolled in 2012, those who dropped out, those who are still in training, those who in supervision and those who are independent, specifying that (1) they are independent from the perspective of the association and (2) they are independent and from the perspective of the national forum.

The analysis of table 3.4 draws our attention to the independent sections (1) and (2), because there are 44 psychotherapists declared independent from the perspective of the association, but only 20 are recognized from the perspective of the national superior forum.

Table 3.4 Trainees total numeric situation for the period 2012-2020

Trainees situation	Number trainees		Percentage	
Dropout	69		36,31%	
In training	55		28,94%	
In supervision	24		12,63%	
Independent (1)	22	44	11,57%	22,12%
Independent (2)	20		10,54%	
Total	190			

The analysis of tables 3.1-3.4 corroborates with the analysis of the personal files of the trainees enrolled, who dropped out of the courses and it results that:

- Dropout occurs after 1-4, maximum 5 meetings and in extreme cases, even after the end of the training period, refusing to participate in supervision courses.
- In 2012, when the training courses started, integrative psychotherapy was still in its infancy; the cities where the first training groups were started had a low economic level. However, these cities have among the first integrative psychotherapists who practice, have clients and are appreciated as professionals;
- Almost half of those who have completed the training and supervision courses are also psychotherapists accredited by the higher forum; the other half postponing the submission of files;
- The number of dropouts is kept equal to the number of psychotherapists recognized by the professional forum;
- Women predominate in the psychotherapist profession; in recent years there has been a greater number of male trainees enrolled in training courses, with an increase in interest in this profession among men;
- The trainees' dropout, according to the analysis of their personal files, is motivated by financial difficulties, health reasons, teaching in other fields, they were not psychologists (some of them), they were students in final years at master's degree and were concerned with completing their studies or they had other expectations, expectations focused on what is commonly understood by integrative psychotherapy: alternative therapies, Reiki, Radiant technique, angel therapy, etc. They were also not compatible with the style of the main trainer. The fact that numerous absences were not allowed, although the schedule was presented a year before, this triggering many negative transfer reactions to trainees who later dropped out of training.

3.2 Objective 2 Identify possible causes related to the trainer's style and the trainees in the dropout situation

The approach of the second objective determines us analyse activities within the association and to point out some aspects considered important.

A. Dropout causes generated by the trainer's style

The trainer is the one who is most often idealized at the beginning of the training program, the enrolment being most of the times determined by the trainee's perception towards the trainer. This appreciation of the trainer, which appeared as a result of a previous interaction (participation in other activities, workshops or conferences where the trainer is known) also extends to the therapeutic orientation, caused by the trainer. We found that the excitement of some trainees is reduced during the training period, and after completing a number of modules, they give up training. The trainer's idealization is gradually or even suddenly extinguished, when:

- The limits and framework of the training program are set;
- The module requirements are established at the beginning of each series and course;
- The group norms are established, etc.

The trainer's style – professor – frequently causes in some trainees a negative transfer, especially when the trainee has an issue with authority. The trainer is a punitive father or a domineering mother ... the recommendations are that during the training, the modules to be coordinated by different trainers, and the personal development program to also be coordinated by another trainer.

The trainer's efforts to respect the curricula, to remind the deadline for submitting papers, to remind the deadlines for enrolling in various scientific activities etc., are in the trainer's reality-

situations to remind the importance of trainee responsibility, and for the trainee an opportunity for frustration.

The association, the professional training provider must comply with the requirements established by the higher forum in the country where it operates, but also with the international criteria. In this regard, national and international requirements for continuous training have provoked many reactions among trainees. Even if at a declarative level, the fulfilment of the requirements for continuous professional training is accepted, when in practice the all data is counted together the costs of carrying out events included in the continuous professional development, reactions appear. Thus, the mandatory requirements of national and international forums are perceived and appreciated as belonging exclusively to the trainer, and frustration is directed towards him/her, the consequence being the abandonment of courses.

Over the years, we have learned to point during each presentation workshop, prior to starting a new series of training, what are the national and international requirements for continuing professional training, what involves being a psychotherapist, not only during training, but throughout life. The emphasis is on lifelong learning.

We also have to underline, whenever necessary, during the training sessions, the group rules, the observance of the training requirements during the whole duration, which generates, as we mentioned, frustrations among trainees.

From our observations, the frustrations generated by the described situations trigger reactions in trainees who perceive the trainer's authority as annoying. Often, in training and personal development sessions, trainees regress to the "hot" point when their authority issues are generated.

The conflict appears between what they are at present (status, material, financial possibilities) and what they are asked to fulfil (attendance, essay writing, essays, papers, participation in scientific events, research, etc.).

The dropout situation is also analysed in the case of university didactic staff, a possible explanation in their case being "I am also a university didactic staff member, and you are also one - why don't you understand me?, why don't you understand that I have to miss a few hours, because I have exams, I coordinate practice, I am working on a project and the deadline is this weekend", etc. Thus, an analysis of the didactic staff members enrolled in the training program shows that out of 8 people enrolled in the period 2012-2019, only 2 continued training. The dropout motivation being: the disagreement with the trainer's personal style, the belief that training was different, work schedule, age, etc. From the trainer's perspective, exposure seems to have been the main issue; the conflict generated between the trainee's cognitions and psychotherapy and last but not least, the conflict offered by the authority (between the trainees and the trainer).

B. Dropout causes motivated by the trainees

In general, the trainees who gave up training in psychotherapy announced the trainer: 36 trainees, the other 33 gave up without a request or an explanation. The announcement regarding the abandonment was made by phone, in writing or by email. Table 3.5 presents the situation in the case of the 69 trainees who dropped out training courses.

Table 3.5 Dropout notification

Notified their dropout			Didn't notify their dropout
By phone	By message	By email	33 (47,82%)
17 (24,63%)	3 (4,34%)	26 (37,68%)	
36 (52,17%)			

The analysis of the files regarding the trainees' situation, who did not announce the abandonment, shows that it appeared after the first meeting with the trainer. Email remains the main way to announce the decision to give up training.

The training courses were carried out in a modular regime, during the weekends, for 4 days, 2 modules at each meeting (as seen in the table below). Thus, for example, the number 5 represents a total of 42 modules, that is the entire training and personal development program.

It is observed that 8 trainees completed the training and personal development, but did not continue with the supervision in psychotherapy program for various reasons and did not have any opportunities for a professional location, to open a practice, work in other fields of psychology and transferred competence of what they learned in training at the place where they teach (human resources, education).

Table 3.6 Number of sessions before dropout

	First year of training					2 years of training	3 years of training
Number of meeting before dropout	1	2	3	4	5	10	15
Number of dropout trainees	33 (47,82%)	5	8	3	8	4	8
		36 (52,17%)					

Abandonment after two years of training and personal development was registered in a number of 4 people, the causes mentioned being health problems and reorientation to other professional fields, but also financial reasons.

Abandonment after a year of training was registered to a number of 33 trainees, the reason being: financial problems, professional reorientation, enrolment in other courses "shorter as duration", choosing another psychotherapy domain, enrolment in another master's degree, etc.

The abandonment after the first meeting was registered at a number of 57 trainees, of which 33 did not announce at all the reason for giving up (according to table 3.5.) The others used phone messages, phone conversations or email to inform the trainer of the decision of abandonment.

4. Conclusions and Proposals

Making an x-ray of the abandonment or dropout of training courses for a professional training provider, with training programs of least 5 years (minimum duration), allows the development of a strategy to reduce dropout. The analysis performed and presented, starting with 2012, allowed the obtaining information on employment and recognition of self-employed therapists, and mainly the recognition of their competence from clients/patients.

Even if the data are presented for a small sample of trainees who dropped out, it was observed from a numerical point of view that the number of dropouts in the first two series of trainees is equal to the number of practitioners, who actually practice in private psychotherapy offices.

The results obtained underline the fact that a training provider should be concerned with a rigorous selection of trainees through interviews, initial assessments and personality assessments. Practice has shown that a student or graduate of psychology, medicine, theology, and social work is not always a good candidate for a training course in psychotherapy.

Motivation for training and taking responsibility for becoming and continuing education in psychotherapy is the main ingredient to stay in training and practice after completing ad graduating courses.

A preparatory information workshop on therapeutic guidance is recommended, in which the training will take place. In this workshop the directions of discussion should be about: duration, challenges, constraints, commitment and its importance for completing courses, the importance of the motivation to complete the training, the realistic presentation of possible issues that may arise in training, assuming the courses dropout without restraint and the presentation of this decision to the coordinator of the training group.

The coordinator of the new training series, most often the main trainer, will introduce himself/herself to the group and will emphasize his/her rights and obligations within the training program.

We believe that the honest presentation of his/her requirements, from the first module or even from the presentation workshop, prior to the start of the course, will contribute to a decision made by the trainee or future trainee, preventing or reducing dropout. We consider that it is mandatory for the trainer to identify potential personality styles among trainees, styles that can interfere positively or negatively (especially) in the course, disrupting its proper development.

We recommend the trainer to pay attention to the enrolment of students from higher education, doctoral students. From the experience, it might be beneficial to organize a separate group, even if the diversity would be limited or perhaps individual attention with each potential trainee would be more appropriated. In such a situation, the benefits and possible difficulties or issues that can be encountered with university didactic staff members enrolled in training are pointed out.

First of all, the trainer must know himself/herself very well (presumably) as style of personality, as a style of transmitting information, as a style of therapy. To know oneself in order to face the different interactions within the group, to delimit where the training/supervision ends and where the therapy begins represent the main ingredients for successful training programs.

If the trainer does not notice this limit between training/supervision and therapy, then there is a risk of consuming a lot of time in a deviation towards group therapy. From experience, the limits placed in these situations led to increased frustration in trainees, the need for a therapy was greater than the trainer's need to achieve the goal of the training program.

Focus-group discussions between trainers and supervisors of training providers on the issues, difficulties reported in the training groups, will help design measures to reduce dropout, the measures being consistent with the socio-economic situation in the areas where training groups take place.

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