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ABSTRACT

POLYTRAUMA IN CHILDREN – INITIAL EVALUATION CRITERIA IN EMERGENCY UNIT

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CONTENTS OF THE THESYS

GENERAL PART

I. INTRODUCTION p. 5
BIBLIOGRAPHY
II. GENERAL ASPECTS OF POLYTRAUMA IN CHILDREN p. 9
BIBLIOGRAPHY
III. MANAGEMENT OF POLYTRAUMA IN PEDIATRIC PATHOLOGY p. 30
BIBLIOGRAPHY
IV. SPECIFIC ISSUES AND CONTROVERSIES IN PEDIATRIC RESUSCITATION p. 49
BIBLIOGRAPHY

SPECIAL PART

V. REASONS AND OBJECTIVES OF THE REASERCH PAPER p. 54
VI. MATERIALS AND METHODS p. 56
VII. PRESENTATION OF THE LOT OF PATIENTS TAKEN IN STUDY p. 64
BIBLIOGRAPHY
VIII. MANAGEMENT OF POLYTRAUMA PATIENT IN THE RESUSCITATION ROOM OF „SF. APOSTOL ANDREI" CONSTANȚA COUNTY HOSPITAL p. 101
BIBLIOGRAPHY
IX. TRAUMA SCORES USED IN THE RESUSCITATION ROOM OF CONSTANȚA TRAUMA CENTER p. 108
BIBLIOGRAPHY
X. NEED OF A PEDIATRIC RESUSCITATION ROOM IN „SF. APOSTOL ANDREI" CONSTANȚA COUNTY HOSPITAL p. 115
BIBLIOGRAPHY
XI. STUDY DISCUSSIONS p. 128
BIBLIOGRAPHY
XII. CONCLUSIONS p. 134
XIII. GENERAL BIBLIOGRAPHY p. 135

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Polytrauma, trauma, child, pediatric, resuscitation

INTRODUCTION

Trauma has become a major cause of fatality and disability, irrespective of the country's economic level [1]. Nearly 16,000 people die from injuries every day and for each of these deaths, many thousands of people survive with permanent disabling injuries [2]. In the United States, trauma costs, such as lost wages, medical expenses, insurance costs, material damage, and employer costs, have reached $ 400 billion a year [3].

In spite of this, the real cost can be determined only when the trauma is considered to affect young people and productive members of society [3]. Studies have shown that the functional outcome of patients with trauma of 1 year or more is below the normal population [4]. Many continue to suffer from residual problems such as long-term physical shortcomings, disabilities and handicaps that may even impact on their ability to fully return to their previous work or old life. [4] A substantial number of people who have suffered trauma may also have less obvious forms of residual sequelae such as emotional or psychosocial disability [5]. Reintegration of patients into society with musculoskeletal trauma requires a multidisciplinary approach [6]. Consequently, knowledge of the impact of trauma on society is essential in adopting such a treatment approach to traumatic injuries [7].

Using a evidence-based approach, the multisystem approach to pediatric polytrauma is problematic. Due to the absence of an agreed definition for "pediatric" and "multisystemic", different age thresholds need to be considered in addressing these emergencies [8]. Growth progresses at a slightly different pace for each child. Pediatric study authors included people presenting at a children's hospital without a clear age-specific specification [9,10], identifying groups of individuals younger than 21 years [11], 19 years of age [12], 18 [13,14], 16 [15-17], 15 [18], or 11 years [19]. The inclusion of both infants and young adults in many of these studies weakens the validity of the proposed conclusions on "pediatric" trauma [20]. The term "multisystemic" refers most often to several serious injuries suffered by a single child following blows of any kind, which put him at risk for several internal injuries. [21] This

may partly explain why many studies in pediatric trauma literature focus on injuries to a single region of the body [10,12-14]. Unfortunately, many lesions are unlikely to be found in isolation, making treatment management protocols difficult to follow.

REASONS AND OBJECTIVES OF THE REASERCH PAPER

REASONS FOR CHOOSING THE RESEARCH TOPIC

With the evolution of human society, new illnesses are emerging that require a different medical approach. It is demonstrated today that the physical, cultural and social environment in which the child is lived presents components that increase the likelihood of isolated trauma and politraumatism.

Diagnosis and treatment of polytraumatism in children, especially those with abdominal component, has been a topic of debate over time and is at the moment also one of the essential elements of the unitary therapeutical approach in pediatric pathology, especially until today were treated separately. Amplification and multiplication of mechanical risks in the last century as well as the increasingly serious conditions of production through:

- traffic accidents,
- natural calamities (earthquakes, floods, fires),
- explosions (accidental, terrorist acts and military actions),
- accidental falls,
- suicide attempts,
- more and more dangerous games,

have favored the increase in trauma. They are the predictable result of the intersection of a potentially dangerous environment with child-specific human behavior.

Worldwide studies show that 20-25% of all trauma is politraumatism, and 30-35% of these are deaths for patients aged between 1 and 18 years. The child differs from the adult through numerous morpho-functional characteristics, which cause a different reaction to trauma. In this situation, conditions specific to the pediatric profile of endowment, care and prophylaxis are necessary, the aim being to reduce the

mortality, the degree of the resulting disability and the care costs for this category of patients.

These are the reasons why in this paper I approached the study of polytrauma in children, and from these we have deepened cases with predominance abdominal trauma, these have the most dramatic evolution.

The purpose of this research is to improve the evolution and prognosis of childhood polytraumatism by establishing the best therapeutic strategy.

OBJECTIVES OF THE RESEARCH

The hypothesis of the research is that there are currently many therapeutic management protocols for pediatric politraumatism, without treatment of choice, especially in our country. In other European countries, and beyond, there is an obvious unity between large centers addressing the child's trauma, the protocols being well defined and common.

To demonstrate the hypothesis of research, we addressed the following issues:

A. Consultation of the specialized literature and comparative description of therapeutic management protocols of pediatric polytrauma in the Pediatric Surgery Clinic of the Emergency County Clinical Hospital "Sf. Apostol Andrei" Constanta;

B. Clinical study of the therapeutic management specific to the pediatric traumatic center in Constanta, represented by the Pediatric Surgery Clinic of the Emergency County Clinical Hospital "Sf. Apostol Andrei" Constanta.

The scientific novelty of the research consists in the fact that in the process of the work, the therapeutic protocols, including their advantages and disadvantages, were analyzed on a complex group of patients with polytraumatism.

The consequence of the research is a better knowledge of the therapeutic management of childhood poly-traumatisms. Also, the results of this study can be used in developing a therapeutic strategy for these conditions, so long-term results are perfect, if not as close to normal as possible.

MATERIAL AND METHODS

RESEARCH METHODOLOGY

The present work has started from a personal initiative, encouraged by colleagues at the Clinic of Surgery and Pediatric Orthopedics of the County Emergency Clinical Hospital "Sf. Apostol Andrei "University of Constanta, regarding the therapeutic management of polytraumatism in children. More specifically, the treatment protocol followed at the Pediatric Surgery and Orthopedic Clinic of a major trauma center, such as the County Emergency Clinical Hospital "Sf. Apostol Andrei "Constanta. We wanted to analyze the management of these diseases, to improve evolution and prognosis, supporting both the theoretical arguments (anatomopatological, pathophysiological and biomechanical) and the clinical results obtained.

The current research was based on a complex study of two components:

i. Comparative description of therapeutic management protocols of pediatric polytraumatism in the Pediatric Surgery Clinic of the County Emergency Clinical Hospital "Sf. Apostol Andrei "Constanta;

ii. The analytical part, which consisted of a prospective and interventional clinical trial, on the therapeutic management of polytraumatism in children.

RESEARCH CONDUCTED DIRECTIONS (STUDIES)

The thesis is an integrated research based largely on a clinical study, preceded by a theoretical study (Figure 1).

Within the theoretical component, which took place over a period of approximately 12 months (during 2011 and 2012), we established a parallel between diagnostic and treatment protocols of childhood poly-traumatisms in centers around the world (which published conclusive data on in the present subject) and putting it into practice at the Pediatric Surgery Clinic of the County Emergency Clinical Hospital "Sf. Apostol Andrei" Constanta.

STUDY COMPONENTS

<table>
<tr><th>2011, 2012</th><th>2012</th><th>2013</th><th>2014</th><th>2015</th><th>2016</th></tr>
<tr><td>THEORETICAL COMPONENT</td><td colspan="5"></td></tr>
<tr><td colspan="6">ANALITICĂL COMPONENT – PROSPECTIVE AND INTERVENTIONAL CLINICAL STUDY</td></tr>
</table>

Figura 1. Components of children polytrauma study

The analytical component developed a prospective and interventional clinical trial, conducted over a 5-year period (2011-2016), in which the clinical aspects as well as the surgical and conservative therapeutic methods used for the treatment of poly-rheumatism in children were analyzed.

PROTOCOL FOR THE PROSPECTIVE, INTERVENTIONAL, RANDOMIZED CLINICAL STUDY

My study was conducted on a total of 116 common and common cases with other colleagues.

The subjects enrolled in the study were the patients of the Pediatric Surgery and Orthopedics Clinic of the "St. Apostol Andrei "Constanta, hospitalized and treated between 01.07.2011 - 30.06.2016. This interval involves first admission and conservative or surgical resolution.

The type of study is a prospective and interventional clinical trial over a 5-year period (between 2011 and 2016) and is a comparison between treatment protocols, both conservative and surgical, of childhood poly-traumatism.

For each patient, a data sheet containing general variables belonging to all patients and specific variables, depending on the organ or traumatized organs, was completed as follows:

I. General data for all patients studied:

- Age
- Sex
- Weight

- Environment of origin
- The year of the accident
- Month of the accident
- The cause of the accident, the production mechanism
- The main traumatized organ
- Combining other trauma
- Glasgow score
- Consciousness
- Respiratory rate
- Pulse
- Systolic blood pressure
- Diastolic blood pressure
- Result in CT
- • Xray result
- Ultrasound result
- No. of leukocytes
- No. of erythrocytes
- Hemoglobin
- Hematocrit
- No. of thrombocytes
- Urine Summary
- Temperature value
- Glucose
- Blood pH
- TGO
- TGP
- INR
- APTT
- Natrium level
- Potassium level
- Crystalline administration
- Administration of plasma or erythrocyte mass

- No. days of mechanical ventilation\
- No. days of hospitalization\

II. Hepatic lesions:

- Type of lesion
- Affected Lobe / Affected Segment
- Degree of lesion
- Surgical or conservative treatment
- Postoperative complications

III. Splenic lesions:

- Type of lesion
- Degree of lesion
- Surgical or conservative treatment
- Postoperative complications

IV. Renal lesions:

- Location
- Normal or pathological kidney
- Degree of lesion
- Surgical or conservative treatment
- Postoperative complications

V. Cavitary organ lesions:

- The damaged organ
- Type of lesion
- Conservative or surgical treatment
- Type of operator intervention
- Lease associations
- Postoperative complications.

VI. Pulmonary lesions:

- Damaged area
- Type of lesion
- Type of treatment
- Pleural effusion
- Lease associations
- Complications.

VII. Skeletal lesions:

- Affected segment
- Type of fracture
- Lease associations
- Surgical or conservative treatment
- Method of treatment
- Complications

VIII. Brain injuries

- Damaged area
- Type of lesion
- Type of treatment
- Lease associations
- Complications

The therapeutic decision (conservative or surgical treatment) with respect to the above methods was taken on the following considerations:

- Age of the patient;
- Polytrauma patient;
- Multiple organ damage;
- Syndrome of compartment;
- Additional instructions
- Those with brain injuries;
- In some cases treatment was an option of the surgeon.

The results were rendered (both in the table method and the graphical method) in absolute, percentage or average.

DESCRIPTION OF THE INVESTIGATION TOOLS USED AT THE PROSPECTIVE, INTERVENTIONAL, RANDOMIZED CLINICAL STUDY

The data sheet was completed for each subject enrolled in the study on the basis of the general clinical observation file. This belongs to the Pediatric Surgery and Orthopedics Clinic of the County Emergency Clinical Hospital "Sf. Apostol Andrei

"Constanta. The data included the demographic, clinical, paraclinical, therapeutic and evaluation data of the patients included in the study.

STATISTICAL ASSESSMENT OF THE DATA FROM THE PROSPECTIVE, INTERVENTIONAL, RANDOMIZED CLINICAL STUDY

Classical descriptive assay was performed for all the variables as follows:

- The average and standard deviation were calculated for the numeric variables;
- The qualitative/dichotomous variables were divided into two classes corresponding to „1" and „0" (respectively M/F, U/R, +/-);
- The proportion was shown in percentage.

It is important to observe that only the cases with collected data (which means that absent data were not marked with an „0", but with „blank") have been included in the statistical analysis of each variable.

A data base was composed in order to perform the statistical analysis, which subsequently permited their analysis with the help of specialized softwares. Microsoft Office Access 2010 was used to compose and manage the data base. It is obvious that during the process of colecting and elaborating data identification information, including PNC, exact address and others were not modified. Once the necessary data were colected and introduced in the matrix, it was easy to export them to the specialized softwares for the statistics analysis.

Special statistical softwares were needed for the descriptive analysis of the followed batches of this paper; for performing statistical analysis in order to observe whether the noted differences hace a statistical value or not; and for the graphic reprezentation of the results. These softwares included: *Microsoft Office Excel 2010, IBM SPSS Statistics 19.* The reason for this great number is that it is imperative to use the best accounting and displaying method for every statistical analysis that was made.

There were several types of statistical analysis that were applyed to this paper. It was first necessary to use the descriptive statistical methods in order to show the batches features (frequencies, averages, standard deviation, maximal values, minimal values etc).

More advanced statistical methods based on the probability theory were used, according to the researched sample. Therefore it was possible to estimate the situation for the entire population that holds these features. The methods are based on testing the differences encountered between the studied batches, usually one batch is exposed to the researched phenomenon and the other is exposed to a comparative phenomenon (which can be, for example, a different treatment). Subsequently, it was necessary to perform some statistical tests to establish whether the differences that were encountered between the two batches had a statistical value or not.

For the statistical analysis, one always starts with the hypothesis that the differences encountered between the two batches do not have statistical value, and emerge because of the fluctuation in selecting the batches. This hypothesis is called null hypothesis. Different types of statistical analysis intend to demonstrate whether this hypothesis is null or false. If this hypothesis is true, then the differences that emerge between the batches are not due to the phenomenon to which they were exposed. In contrast, if this hypothesis is false, then the alternative hypothesis will be accepted and one can confirm that the notable differences have statistical value.

In order to be able to reject the null hypothesis and thus to assert with certain certainty that the differences between the studied groups are due to the effects of the phenomenon pursued, it is necessary to achieve a certain degree of certainty, that the obtained and analyzed data can be extrapolated to the entire population which has characteristics similar to those of the studied groups. Of course, a degree of certainty of 100% is virtually impossible to achieve, therefore, in practice, a maximum probability level, ie the maximum permissible error, was chosen. This level of significance is denoted by **p**, and has a maximum admissible value of 0.05, which is a 5% chance of error. Its interpretation is as follows: if we repeat the same experiment 100 times, 95 times we will get the same result. A level of significance **p** = 0.05 corresponds to a confidence level of 95%. This level of confidence (level of confidence) expresses the possibility that the value of an indicator is within the confidence interval (confidence interval). Confidence interval (confidence interval, CI) is the range of values in which the percent calculated on the basis of the sample falls within the total population. The confidence interval is the range of values around the estimated (calculated) point. A 95% confidence interval (95% IC) is often used,

indicating that there is a 95% probability that the value of the effect to be pursued is within that range.

NEED OF A PEDIATRIC RESUSCITATION ROOM IN „SF. APOSTOL ANDREI" CONSTANȚA COUNTY HOSPITAL

Trauma Center Constanta, center with real potential for specialization in pediatric trauma

The Dobrogea area comprises 2 counties - Constanţa and Tulcea, with a population of approximately 1.3 million inhabitants, of which about 25% are people aged 0-18 [22].

Constanta Trauma Center is a first-level center serving the entire region of Dobrogea, but it does not have a dedicated space dedicated to the management of the poly-ritualized child.

As the Constanta Trauma Center serves a pediatric population of at least 400,000 people, it should have a dedicated pediatric trauma service, provide pediatric medical services from the accident site to the rehabilitation and reintegration of the patient in the family, and society.

The Center's trauma team should be available 24/7 and able to treat at least two pediatric patients simultaneously. Subsequently, for the specialized consultations, Constanta Center has a permanent guard for pediatrics, pediatric surgery, anesthesia, neurosurgery, radiology, pediatric orthopedics, neonatology [23].

Using trauma scores can help identify severe lesions, manage them, and predict prognosis. Two of the most used systems are the Pediatric Trauma Score and the Revised Trauma Score - presented in the previous chapter. Their advantage over other prediction systems of childhood trauma is the inclusion of physiological variables, not just anatomical factors. Small scores are associated with higher mortality, and therefore the need for a Rehabilitation Trauma Score <12 or Pediatric Trauma Score <8 in a child shows the urgent need to transfer to a trauma center specialized in treating children [23] .

Anatomy of the child, argument for specialization in pediatric polytrauma

The cephalic extremity in the child has a larger surface proportionally and is thus exposed to significant haemorrhages from scalp wounds with open bleeding or as cephalhematomas that can cause hypovolemic shock in young children. The skull is thinner, it transmits the energy more easily and predisposes to the capillary fractures [24].

Opened cranial sutures in infants can block increases in intracranial pressure and may delay early recognition of intracranial lesions. Small children have large intracranial extraaxial spaces through which cortical vessels pass through and are in danger of shearing by acceleration-deceleration forces such as aggressive "shaking"; this leads to classical lesional findings such as subarachnoid hemorrhages [25].

The size of the head in young children is proportionally higher than the rest of the body, making it easier for injuries if children fall and can lead to airway obstruction if it is placed in decubitus without supporting the spine [8].

The cervical spine of the baby is much more horizontal than in the adult, with less calcified vertebral bodies with increased ligamental laxity and less muscular support, all allowing translational forces to produce colonic lesions without bone damage. Due to the weak cervical muscles and the large skull, the starting point of the forces is much cranial, predisposing children to spinal injuries in the upper segments, more frequently than in adults [26,27].

Significant anatomical differences between airways to child and adult lead to a different approach to this segment in major emergencies. Laryngeal cartilages in the child are more compressible and therefore less prone to fractures than the fertile, ossified cartilage of the adult [28,29]. Although the larynx is relatively protected, children have a higher risk of compromising the airway due to swelling or swelling of the hematoma relative to the lower caliber of the airways and throat [30].

Thoracic wall in children is more compressible, tracheobronchial structures are more vulnerable, the heart is previously with mobile mediastinal elements, all predisposing to intrathecal lesions, such as pulmonary contusions, even with minimal thoracic wall aggression. Delicate tracheobronchial elements are susceptible to barotrauma, especially in situations with excessive ventilator volume during resuscitation, generating iatrogenic pneumothorax. The diameter of the respiratory components is lower than in the adult, and a change in the internal diameter (from

secretions or aspirated liquids) has a fourfold impact on airflow resistance, as the Hagen-Poiseuille equation predisposes to obstruction air routes [30].

The abdomen of the child is relatively more voluminous than the rest of the trunk, the muscles are still underdeveloped, and has large intraabdominal organs in volume, which predisposes to injuries to parenchymal organs in trauma by contact with a hard body, whether moving or not, as well as traumatic lesion injuries following acceleration-deceleration mechanisms such as car seat belt lesions [30].

The skeleton is incompletely calcified, which makes the bones more flexible and leads to lesions by compression or fractures "in green wood". Large ossification centers and low-strength epiphyses explain the different types of fractures specific to the child, such as those described by the Salter-Harris classification [31].

The larger body surface compared to the body as a whole compared to the adult, and due to thin epidermal and dermal layers of the skin, together with a shortness of subcutaneous fat and immune thermoregulation mechanisms, lead to high risk of hypothermia in cold environments , which must be taken into account when examining a naked child victim of an accident of any kind [32].

Elements of child physiology, argument for specialization in pediatric politraum

Child physiology, metabolic constants are different from adult because the child is not a "miniature adult". In the Resuscitation Chamber, particular attention should be paid to heart rate, respiratory rate, and peripheral perfusion. All of these may indicate a rapid deterioration of the general condition in the case of polytraum [33].

The volume of heart-pumped blood is primarily mediated by the rate of heartbeat as a contrast to adult infarct volumes. Children with significant blood loss may develop tachycardia, which may be present for a certain period of time before compromising the volume of pumped blood. Furthermore, the vascular system is sensitive to endogenous catecholamines, allowing children to alter their vascular tone according to haemodynamic changes and to direct blood perfusion to vital organs [30].

These two parameters, the ability to increase the frequency of heartbeats and modulate peripheral vascular resistance, help the child maintain blood pressure and perfusion within normal limits, in the presence of significant bleeding (25% to 30%

loss in blood volume). Thus, hypotension is a late and worrying sign of vascular compromise in children [34].

In children, the basal pulmonary volume is relatively fixed, so ventilation is maintained mainly by the respiratory rate (tachypnea), and less by alveolar expansion, ie hyperpnee. Smaller residual volumes contribute to atlectasis, and a lower functional residual capacity leads to rapid desaturation during apnea [35].

The metabolic requirements of children are higher than in adults. Children have a higher energy consumption and a higher caloric base. Although stress-induced blood glucose is common in polyarraemas, hypoglycaemia may also occur during treatment and should be treated promptly [30].

The particularities of the ABC resuscitation for children

PRIMARY ASSESSMENT

At the scene of the accident and in the Resuscitation Room of the pediatric trauma center, attention should be directed to the immediate identification and correction of life-threatening conditions [36,37]. Abbreviation <C> ABCDE, comes from the abbreviations in English (C = Circulation and Haemorrhage Control, D = Disability or Neurological Deficit, E = Exposure / Environment / Extremity) and is used to prioritize resuscitation actions [38]. The members of the pediatric trauma team act in parallel and anticipate the problems before they occur [37,39,40].

During resuscitation, attention is directed to the continuous stabilization of vital functions, continuous assessment and care, as well as permanent support to counteract the negative response to trauma [40,41]. Early detection of life-threatening complications is essential because the condition of the child may be damaged due, for example, to lesions that were not observed in the initial phase [42]. Many traumatized children do not need the Resuscitation Chamber and should be transported from this area directly to Children Intensive Care, where specialized supervision and treatment is continued [40, 41].

SECONDARY ASSESSMENT

In the Pediatric-specific Trauma Center, the secondary assessment begins after the primary assessment is complete and the resuscitation maneuvers are initiated. For this stage, a much more thorough examination needs to be started. Appropriate instruments, such as the pulse oximeter, blood gas meter and CO2 in

particular, are useful in guiding these maneuvers. Paraclinic evaluation, bed ultrasound and radiological images are started. Place a nasogastric aspiration probe and a uretrovezical catheter (minimum diuresis should be 0.5ml / kg / h). the nasogastric tube will decompress the stomach because the full stomach affects the respiratory capacity [30].

At this stage, the child is stabilized to allow transport to the radiology service or to a clinic where further specialist therapy can be continued. Check the ABC suite and neurological status again because some lesions may have a late impact and may occur during therapeutic maneuvers. Intubation probe movement, pneumothorax, regurgitation and aspiration of stomach contents, ocular haemorrhage, worsening of intracranial tension may be considered. Carefully monitor fluid administration to prevent hyperhydration. Patient analgesia and sedation is instituted [30].

STUDY DICUSSIONS

Trauma - a major cause of mortality and morbidity among the pediatric population

Trauma remains the leading cause of death in children worldwide, including in the country. For this reason, the traumatized child's management should be professionally carried out in pediatric trauma centers. Road accidents are the main cause of childhood polytraumatism, followed by injuries caused by falls and burns [43]. This observation also follows from my study.

The anatomical and physiological differences of the traumatized child should be considered for the optimal approach of the traumatized child to the adult [44]:

• Polytrauma are more common in the child due to the size of the body, which allows a wider distribution of traumatic injuries;

• The higher the relative body surface of the child allows for more caloric loss;

• The liver and spleen are located previously in the abdomen, and abdominal wall muscles and less developed fat tissue; for this reason, intraabdominal organs are more susceptible to trauma;

• Child's kidney is less protected and more mobile, thus sensitive to lesions by deceleration;

• Growth cartilage is still active, therefore there is the possibility of Salter-Harris type fractures, which may lead to bone growth discrepancies;

• The baby's brain is less myelinated and the bones of the skull thinner, so the cranial lesions are much more serious.

Maintaining homeostasis is done with a more significant calorie expenditure for the child, so the traumatized child needs a higher energy reserve for recovery than the adult. For this reason, children respond to the trauma differently from adults, depending on age and severity of the lesion. Unlike adults, children have a greater ability to maintain tension, with blood loss of 25-30%. For this reason, any change in heart rhythm, blood pressure or peripheral perfusion should raise a question mark about possible cardiopulmonary collapse [45].

Children do not react very well if they are taken out of their familiar environment. They are usually much more agitated compared to the severity of lesions, making evaluation much more difficult. Recent studies have shown that 25% of children involved in a road accident will develop signs of posttraumatic stress after discharge [46].

The emergency medical doctor must decide to internalize the traumatized patient, transfer it to another center, or outsource it. The decision of hospitalization should be made after consultation with the surgeon and pediatrician. Children with moderate to severe trauma have a better prognostic prognosis if they are treated in a child-intensive care unit than in adults [45].

Indications for admission may be numbered but the baseline is the admission of those patients who should be continuously monitored with potential for impairment of vital functions or complication of lesions (Table 1) [45]. There must be a specific and well defined management protocol for the pediatric pediatric pediatric patient. Of course, those children who remain hypotensive following degrading of crystalline solutions require emergency surgical exploration [45].

Hemodynamic instability despite intense volumetric resuscitation efforts
Transfusion of more than 50% of total blood mass
Radiographic evidence of pneumoperitoneum, intraperitoneal bladder rupture, grade V renovascular lesion
Shooting lesion at the level of the abdomen
Evisceration of intraperitoneal content
Signs of peritonitis
Signs of contamination with intestinal content at abdominal diagnostic puncture

Table 1. Indications for surgical intervention in pediatric polytrauma children [45]

The need for pediatric trauma centers

Specialty literature suggests that pediatric patients with severe traumatic injuries have a better vital prognosis when treated in a trauma center in a children's hospital or a center with a specific pediatric branch [47-51].

It is very important for a pediatric trauma center to have a wide range of child-specific services including emergency doctors specializing in pediatric traumatology, pediatric medical and surgical subspecialties, pediatric anesthesia, pediatric intensive care, posttraumatic stress counseling, pediatric rehabilitation. Assistants with pediatric pediatric skills are also an important factor in this respect [52].

The management of the pediatric pediatric patient needs special attention. There are particular aspects that are unique to the child, such as minimal diagnostic deletion, family presence during primary assessment, pediatric trauma specialists, electrolyte management and infusion. It is quite important to calculate the radiation dose for the diagnosis of lesions. The existence of the imaging and diagnosis protocols of pediatric pediatric patients is very important [53].

The specific pain therapy protocols can help control pain and establish child comfort. The competence and the ability to provide a wide range of pain strategies for children, including regional or local control, are essential factors in the therapeutic management of pediatric trauma. Pain therapy is important from the time of the accident and later during treatment and healing, including rehabilitation [54].

Some hospitals may not have the resources needed to treat polytheumed children, so children with serious injuries must be transported to third-party institutions where these resources are available. Trained transport teams for pediatric intervention are optimal [55].

In the center of pediatric trauma there must be a well-placed section of Pediatric Intensive Care. This facility should have monitoring, medication, and physiological support technology for patients [51].

Pediatric reanimation surgeons, surgeons, and anesthetists should work in a team to adequately care for the polytheumed children in the intensive care unit. Furthermore, the presence of experienced nurses in pediatric intensive care and appropriate ancillary staff is necessary for the constant monitoring and treatment of poly-matism children [56].

Efforts to prevent accidents

Preventing accidents is the cornerstone of any pediatric trauma issue. Accident Prevention Initiatives deliver results in other countries [57].

For example, the Safe Kids program in the United States is very useful in reducing the number of deaths from trauma [58].

Trauma programs could use registry data to identify needs in the prevention of major vital injury. Also, educational establishments should spend time in teaching activities to prevent falls, recognition and intervention in the case of drug or alcohol abuse, safety measures for the passenger child in cars, cycling, aquatic activities and other activities can cause major trauma among the pediatric population. Primary healthcare providers should also play a role in accident prevention [58].

A pertinent final conclusion is that care for pediatric pediatric patients requires knowledge of child anatomy and pathology. Initial assessment, management and resuscitation requires a pluridisciplinary approach, including pediatric surgeon or pediatric orthopedist, reanimator and anesthetist. The degree of recovery of politraumed children is usually remarkable, as evidenced by this study, even after extremely serious injuries. Every time care must be taken, under the assumption that complete healing can be obtained [59].

CONCLUSIONS

- In the present study, the recovery rate of polytrauma children was excellent, with a mortality rate of 2.6% (due to irreversible organic lesions);

- Intra-abdominal organ lesions required only conservative treatment with hemodynamic support, avoiding surgery successfully;
- The traumas of the osteoarticular system accounted for the highest proportion of all the cases studied, which shows that in the Trauma Center, Constanta requires a mixed team of pediatric surgeons and pediatric orthopedists;
- Pediatric Surgery and Pediatric Orthopedics Specialists must be actively involved in planning the therapeutic management of the traumatized child;
- The unique traits of traumatized children, both physiological and anatomical, require the creation of specific trauma centers at national level to serve the whole country by region;
- Each county should identify the means available to the pediatric therapist, especially the very young children at higher risk, with the capability of assessing, stabilizing and eventually transferring to a pediatric-specific trauma center;
- Every emergency medical practitioner must have a pediatric pediatric management certificate, which should be renewed regularly for continuous training in this field;
- Specific protocols for the management of the child should be developed, different protocols to the adult due to the specific physiological and anatomical elements of the child;
- The necessary financial resources should be found to allow the functioning of Pediatric-specific Trauma Centers to cover territorial needs, as well as resources for the research and education strategy to prevent accidents in children.

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