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Postępowanie przedszpitalne w urazach u dzieci (doniesienie wstępne)

Streszczenie

Wstęp. Urazy stanowią jeden z najpoważniejszych problemów medycyny ratunkowej wieku dziecięcego a ich leczenie winno się rozpoczynać już w okresie przedszpitalnym.

Cel pracy. Analiza postępowania medycznego udzielonego dziecku z urazem w okresie przedszpitalnym.

Materiał i metody. Badaniem objęto 68 spośród 400 dzieci przyjętych w Szpitalnym Oddziale Ratunkowym (SOR) z powodu urazu, które miały udzieloną pomoc w okresie przedszpitalnym przez różne podmioty opieki zdrowotnej w okresie od 23.02.09 do 23.03.09. Analizie poddano płeć, wiek, miejsce i rodzaj zdarzenia, lokalizację i rodzaj urazu oraz sposób udzielonej pomocy.

Wyniki. W badanej grupie dzieci, uraz częściej dotyczył chłopców (62,1%) niż dziewczynek (27,9%) oraz dzieci w wieku powyżej 10 roku życia (62,1%). Obrażenia głowy oraz obrażenia kończyny górnej odnotowano w każdej z lokalizacji po 24 spośród 68 badanych (35,9dzieci), urazy kończyny dolnej u 21 dzieci (30,8%), 5 oparzeń (7,4%), urazy brzucha u 2 dzieci, uraz klatki piersiowej u 1 dziecka i uraz kręgosłupa w odcinku lędźwiowo-krzyżowym u 1 dziecka. Trzydzieści pięcioro spośród 68 dzieci (51,5%) przywiezione zostało po urazie do SOR przez karetkę pogotowia ratunkowego w tym przez zespoły podstawowe 14 dzieci (40%) i przez zespoły specjalistyczne 21 dzieci (60%). Lekarz POZ udzielił pomocy 21 dzieciom (30,8%) a pielęgniarka szkolna 12 (17,6%). W większości przypadków pomoc przedszpitalna udzielana dzieciom przez pracowników ochrony zdrowia była prawidłowa. Zastrzeżenia budził sposób postępowania w stosunku do 13 dzieci, co stanowiło 19,1%. Dotyczyły one braku podjęcia leczenia bólu pourazowego u 9 dzieci, nieprawidłowego zaopatrzenia rany lub braku jej zaopatrzenia u 2 dzieci i nieprawidłowo założonego unieruchomienia transportowego u 2 dzieci.

Wnioski. Wstępne wyniki analizy pomocy przedszpitalnej udzielanej dziecku po urazie przez pracowników ochrony zdrowia budzą niepokój i potwierdzają zasadność dalszego kontynuowania badań, celem poprawy opieki nad dzieckiem po urazie.

Słowa kluczowe: postępowanie przedszpitalne, dzieci, urazy.

The pre-hospital treatment of paediatric injuries (a preliminary report)

Summary

Introduction. Injuries to children are the most important problems in paediatric emergency medicine. Treatment of paediatric injuries should start immediately after the accident occurs.

Objective. Analysis of pre-hospital treatment of children with injuries.

Material and methods. The study comprised 68 children from among 400 children who were admitted with injuries to the Emergency Department. This group of patients received first aid from health care professionals during the period from 23.02.2009 to 23.03.2009. We analyzed sex, age, kind of trauma, location and mechanism of injury, circumstances of accident and the quality of first aid.

Results. During the period of this study, injuries in the group comprised twice as many boys as girls (62.1 9% boys 27.9% girls). Children over 10 years (62.1%) more often had injuries than other children in the group. Head injuries and injuries of upper limbs were noticed in 24 children (35.9%), 21 children suffered from lower limb injuries and 5 children (7.4%) had burns. Two children had abdomen injuries and 1 child suffered from chest and 1 from spine injuries. Thirty five children (51.5%) were transported by ambulance to emergency hospital departments; in this group 40% were transported by "basic ambulance" and 60% were transported by "specialist ambulance". Twenty one children (30.8%) were treated by GP doctors and 12 (17.6%) by school nurses. In the majority of cases, the pre-hospital treatment offered by health care workers was correct. However, in 19.1% of children pre-hospital treatment was performed incorrectly. Nine children did not receive painkillers, in 2 cases wounds were not dressed correctly and 2 children were not provided with proper immobilization of fractures.

Conclusions. Preliminary results of the analysis of treatments offered by health care professionals to children after injury cause concern and confirm the need for continued research to improve child-care after injury.

Key words: pre-hospital emergency care, children, injury.

Injuries are one of the most serious problems in children's emergency medicine. They are the primary reason for deaths of children over one year of age and one of the most frequent causes of children's referrals to hospital emergency departments and hospitalization in the departments of paediatric surgery. It is also known that first aid, when correctly applied, can save lives of many children with severe injuries to the body and can improve the prognosis for children who suffer non-life-threatening injuries [1-4].

The principles of offering first aid to children with injury unfortunately are not always followed; the most frequent errors are: lack of equipment adequately matched for the child, incorrect diagnosis of the child's condition, incorrect immobilization of fractures and incorrect dressing of wounds, as well as disregarding pain [1, 2, 4-8]

In order to provide the child with adequate first aid, one should know the anatomical and physiological characteristics dependant upon the children's age, possess interpersonal communication skills to make contact with the injured child and his/her parents/guardians, possess the knowledge about how to carry-out objective examination and the correct interpretation of the results of this examination, know the principles of providing first aid, and have suitable equipment for the child [1, 2, 9, 10]

THE AIM OF THE STUDY

Although errors and shortcomings in pre-hospital proceedings with the child after injury are often the subject of discussion in various fora in national and foreign literature, there is a lack of comprehensive studies on this subject. Hence it is appropriate to study and analyse the conduct of medical treatment given during children's pre-hospital treatment after injury.

METHODS

The children studied comprised 68 from among 400 who came into the Emergency Department (ED) because of injury and who had received pre-hospital emergency care by health care workers between in 23.02.09 and 23.03.09. The sex, age, location and type of trauma, circumstances of the accident and the way in which help was given were analysed. To help increase the reliability of the study it was carried-out over the period of one year.

RESULTS

From among 400 children admitted to the ED during the year of the study, 68 (49 boys and 19 girls) had been offered pre-hospital care (first aid) by various health care workers. Thirty five (51.5%) of these were transported to the ED by ambulance; of these, 14 children (40%) arrived by general ambulance and 21 children (60%) by specialist teams. General Paediatric Doctors applied first aid to 21 children (30.8%) and school nurses applied first aid to 12 children (17.6%). This is shown in Table 1.

In the study group the patient's age ranged from 0 to 18 years old, with the majority of children (72 %) above 10 years of age as shown in Table 2.

Most incidents took place at the children's schools (50%); followed by those at home (26.5%), in the street (10.5%),

TABLE 1. The subject providing the pre-hospital emergency care the child with injury.

Person providing first aid	Number of patients
Ambulance team	35 (51.5%)
1. Specialist ambulance team	21
2. General ambulance team	14
School nurse	12 (17.6%)
Primary Health Care physician	20 (29.4%)
Sport doctor	1 (1.5%)

TABLE 2. Age in the research group

Age	Number of patients
0-12 months	2
1-4 years	7
5-9 years	10
10-14 years	22
>14 years	27

- especially on the way to school and back; during sports activities (5.5%); and in public places (3%).

The investigation noted that a single fall was the cause of injury for 24 children (35.3%); hitting against a hard surface for 15 children (22%); accidental hitting by another person for 4 children (5.9%); accidental hitting by a ball or other object for 4 children (5.9%); and burns for 4 children (5.9%); with a few injuries due to other causes (Table 3).

TABLE 3. The cause of injury in the studied group.

The cause of injury	Number of patients
Falling down	24 (35.3%)
Fall from height	3 (4.4%)
Traffic accidents	2 (2.9%)
Battery accidents	3 (4.4%)
Hit by other person	4 (5.9%)
Hit with a ball/other object	7 (10.3%)
Hit against hard surface	12 (17.6%)
Injury with a sharp implement	1
Thermal burn	
The mechanism: pouring sth hot onto the body	4 (5.9%)
Explosion of fireworks	1
Others (unfortunate step, hitting by the door)	6 (8.8%)
No data available	1

Injuries to the head and upper limbs affected 24 children from among the 68 studied (35.9%). Injuries to lower limbs affected 21 children (30.8%); burns - 5 children (7.4%); injuries to the abdomen - 2 children, injury to the chest - 1 child and injury to the spine - 1 child. External injury of the head was the most frequent injury (20 children), followed by twisting of the ankle (10 children) and fracture of an upper limb (9 children). The kind of injuries in the group analysed is shown in Tables 4, 5 and 6.

TABLE 4. The injury of head, spine, chest, abdomen in the studied group.

Kind of injury	Head	Spine	Chest	Abdomen
	n	n	n	n
Cutaneous injury (a bruise)	20	section p-l 1 child	1 child	2 children
Wound	8	0	0	0
Concussion	7	0	0	0

TABLE 5 . Injuries of limbs in the studied group.

Kind of injuries	The upper limb		The lower limb	
	n	n	n	n
Cutaneous injury (a bruise)	8		8	
Sprain	1		0	
Dislocation	0		10	
Fracture	9		3	
Wound	2		1	

TABLE 6 . Burn in the studied group.

Kind of injury	The upper limb		Chest	Head	Abdomen
	n	n			
Burn	3	1	2	1	1

Pre-hospital emergency care was provided in the correct way for the majority of children in the study. However, treatment was lacking in 13 of the 68 children (19.1%). The main problems concerned lack of treatment for post-traumatic pain (9 children); incorrect dressing of wounds (2 children); and incorrect immobilization of fractures (2 children). From among these 13 children who received incorrect pre-hospital treatment, 6 required subsequent hospital treatment (Table 7).

TABLE 7. Affirmed irregularities in providing first aid in the studied group.

Irregularities in pre-hospital emergency care	Number of patients
Lack of analgesic treatment	9 (13.2%)
Incorrect dressing of wounds	1 (1.5%)
Lack of dressing of the wound	1 (1.5%)
Incorrect immobilization for transportation	2 (2.9%)

Indications to the hospital treatment were affirmed in 15 from among 68 analysed children with injury. In the group of 15 children classified to the hospital treatment, not undertaking of the analgesic treatment during pre-hospital emergency care was noted down in 3 children, 2 children had incorrect immobilizing dressing and 1 child -incorrect dressing of the wound (Table 8).

DISCUSSION

Correct pre-hospital care has a significant impact on successful further treatment of children who have suffered injury. There are differences in providing first-aid to chil-

TABLE 8. Kind of the treatment.

Kind of the treatment	Number of patients
Hospitalization	15 (22.1%)
Lack of analgesic treatment	3 (4.4%)
Incorrect immobilizing for transportation	2 (2.9%)
Incorrect dressing of the wound	1 (1.4%)
Ambulatory	53 (77.9%)

dren and adults. These derive from the anatomical and physiological differences of childrens' systems. In addition, helping the child also helps establish positive relations with both the child and with his/her parents. Encouraging parents or guardians to help during provision of first aid to their child helps stabilise the child's condition and improves the outcomes of the treatment.

Knowledge of the principles and practice of first aid for children with injuries is essential for every doctor, nurse and paramedic working in emergency medicine and in primary health care. As this study clearly implies that the medical assistance to the child received after injury is not only provided by the emergency ambulance service but also by doctors, nurses working in primary health care and school nurses [11].

In addition to the knowledge of the principles and the skills of applying first aid to children with injury, a prerequisite for correct and effective first aid is properly equipped ambulances, primary care facilities and treatment rooms in schools, together with training in the use of paediatric rescue and support equipment [1-3].

The preliminary analysis of the emergency treatment in the group of children studied showed that in the majority of cases they were provided with the correct treatment after injury. However in the case of about 20% of children, there were faults in treatment. The errors related first of all to failure in providing pain control, which confirmed the ignorance of understanding the role of pain in the pathogenesis of post-traumatic shock. In the majority of cases, pain is the main cause of developing shock after injury. Other factors contribute to the shock pathophysiology a little later after injury happened. The application of pain-killers for children with burns, fractures of long bones, dislocation in the joints, extensive wounds and abrasions, reduces the shock reaction and also reduces the intensity of inflammatory reactions, helping compensate for earlier failures and shortening the treatment duration [5, 6, 12, 13].

Incorrect immobilization of fractured limbs was the second most frequent fault noted in this study. In one case, the immobilization during transport was put on the side of the broken limb and in a second case it was placed close to the fissure of fracture. In both cases the immobilization function was unsatisfactory. Properly set-up immobilization first of all has an analgesic function and prevents the movement of bone fragments and further damage to soft tissues, blood vessels and nerves, and also helps prevent further swelling [1-3, 11].

The third error of the pre-hospital treatment which was observed in the study was not protecting of burn by General Paediatric Doctors against infections in one case and the unnecessary application of dressings with ointment on burn wounds. Every wound, according to surgical principles,

should be treated as a potential entrance of infection and therefore protected in a sterile way. In every hospital emergency department, before the wound is handled, it should be carefully checked and assessed; in many cases swabs for bacteriological investigation need to be taken. Dressings with ointment make this more difficult, in particular bacteriological examination and therefore should not be used in pre-hospital treatment [14, 15].

In this pilot study, the assessment of the quality of pre-hospital treatment for children with injuries showed certain irregularities in immobilizing of limbs, treating wounds and controlling pain.

CONCLUSIONS

This preliminary analysis of pre-hospital emergency care given to children after injury confirms that there are issues which require further investigation and analysis.

Both doctors and nurses, and also those responsible for first aid in public and private organizations should be trained in the techniques and procedures for providing first aid for children with injuries to help protect the health of children. Such training is provided by the programme "Paediatric *Basic Trauma Life Support* (BTLS)".

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