

Most frequent interventions involving children in prehospital emergency medicine

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ABSTRACT

A retrospective study of interventions involving children in the period from 2011 to 2015 was conducted at the Teaching Institute for Emergency Medicine of Zagreb. During this period a total of 18,356 interventions involving children occurred in the field. From 2011 to 2013, 11,576 interventions occurred, which makes up 4.56 % of all interventions in that period. During 2014 and 2015 there were 6,780 interventions which make up 3.69 % of all interventions in the field during that period. There was a 20 % reduction in the number of emergency interventions involving children in the last two years of the study in comparison to the previous period. The greatest number of these emergency interventions is due to injury. From 2011 to 2013, the total number of interventions involving injured children was 24.59 % as opposed to 19.94 % from 2014 to 2015. There is a statistically significant decrease in the number of occurring injuries by 19%, whereas the number of head injuries went down from 12.48 % to 10.01 %. That marks a decrease of 20 % in the second part of the studied period. This is most probably a result of better injury prevention as a result of education programs in preschools, schools, media campaigns, and the use of protective equipment (protective helmets for cyclist, skaters, skiers etc.)

Key words: children, trauma, emergency medical service

INTRODUCTION

When we say children we are actually speaking of a diverse population. The term 'child' refers to a person from birth to adulthood (18 years of age). Differences

in weight, height, emotional and cognitive capabilities are apparent. A child is not a little adult and in caring for a child one must take into account the differences (anatomical, physiological and psychological) pertaining to the certain age of said child. Approaching a critically sick or injured child is challenging for prehospital emergency doctors. The procedure in the field has to be in accordance with the procedure in the hospital. (1, 2) In hospitals children are cared for by paediatric specialists, paediatric surgeons, paediatric anaesthetists, etc., so it is extremely important for each physician to attain knowledge and skills in recognition and treatment of a vitally endangered child. After learning and perfecting their knowledge it is vital to practise these mastered skills and keep abreast on new developments in the field. A child that is critically ill will never be a routine procedure for prehospital emergency doctors, because it is not a frequently encountered situation and when they do occur they encourage medical personnel to further their knowledge and practise in order to hone their skills. (1-3)

Worldwide studies have shown trauma to be the leading cause of death in children above the age of one. (1-5) In the last couple of years Croatia has seen a drastic drop in mortality and injury in traffic accidents. Croatia, like the rest of Europe, has the lowest child mortality rates in the world.

MATERIALS AND METHODS

We analysed data from the medical records of the Teaching Institute for Emergency Medicine of Zagreb for a period of five years, from 2011 to 2015. We have included all performed interventions of emergency medical services for patients from 0-18 years of age. We analysed all the

diagnosis and patients were divided into categories of diseases in accordance with the ICD (International Classification of Diseases) classification of diseases. (6)

The five-year period was split into two segments: the first from 2011 to 2013, and the second from 2014 to 2015.

Analysis of the data was performed by the statistical program MedCalc Statistical Software version 15.8 (MedCalc Software BVBA, Ostend, Belgium; <https://www.medcalc.org>; 2015).

RESULTS

During the period of 2011 - 2013 we accomplished 253,785 emergency interventions in the field. Out of this number of interventions, children were involved in 11,576 interventions (4.56%), while in the period from 2014 - 2015, of total emergency interventions (183,578), children were involved in 6,780 interventions, or 3.69%.

There was a 20% reduction in the number of emergency interventions involving children over the last two years of the study in comparison to the previous period. In both periods, the number of interventions that occurred outdoors (60%) as opposed to at home (40%) remained the same.

There was a slight increase in cases that were transported to hospital for further treatment or hospitalization. In the period from 2011 to 2013, it was 69.11 %, while from 2014 to 2015, it was 71.05%. The stated increase is not statistically significant, and can be partially explained by the involvement of T2 (two nurses) medical teams into the emergency medical services.

The greatest number of these emergency interventions is due to injury, from 2011 to 2013, the total number of interventions

involving injured children was 24.59%, as opposed to 19.94% from 2014 to 2015.

There is a statistically significant decrease in the number of occurring injuries by 19 % in the second part of the studied period. This is most probably a result of better injury prevention as a result of education programs in preschools, schools, media campaigns, and use of protective equipment in traffic and sporting activities. In addition, the number of head injuries went down from 12.48 % to 10.01 %, which marks a decrease of 20 % in comparison to the first part of the studied period.

After injury, the most common cause of interventions with children are psychiatric diagnoses, respiratory issues, convulsions and epilepsy, gastrointestinal problems, syncopes, fever, intoxication, infectious diseases, etc. There were no statistically significant changes in the number of interventions for the analysed periods.

The only other difference between the two periods is in the decrease of ethanol intoxications. From 2011 to 2013, the percentage of interventions due to alcohol consumption in children was 3.15 %, whereas from 2014 to 2015, 2.67 % occurred, which indicates a drop of 15 %. This can be attributed

to the continuing education and implementation of educational programs in the City of Zagreb. However, the total number of these types of interventions is still concerningly high, and despite the decrease, it still amounts to a staggering 90 interventions per year.

A special mention must be made of diagnoses with codes Z00-Z69 from the ICD-10. 14 % of all interventions involving children fall under these diagnoses, which are a result of inadequately managed medical documentation.

Table 1. Emergencies involving children

EMERGENCIES INVOLVING CHILDREN				
	2011 - 2013	%	2014-2015	%
	Total No		Total No	
	11.576	4.56%	6.780	3.69%
Intervention at home	4.795	41.42%	2.910	42.92%
Transported to hospital	8.000	69.11%	4.817	71.05%

Table 2. Interventions based on ICD (International Classification of Diseases)

Diagnosis	2011-2013	%	2014-2015	%
	Total No		Total No	
	11.576		6.780	
All injuries	2846	24.59%	1352	19.94%
Without diagnosis (Z00 – Z69)	1.611	13.92%	964	14.22%
Head injury	1.445	12.48%	679	10.01%
Psychiatric (F00 – F99)	1199	10.36%	704	10.38%
Respiratory	1.080	9.33%	693	10.22%
Convulsions and epilepsy	844	7.29%	537	7.92%
Digestive tract	828	7.15%	552	8.14%
Syncope and collapse	485	4.19%	342	5.04%
Fever	484	4.18%	315	4.65%
All intoxication	444	3.84%	235	3.47%
Alcohol intoxication	365	3.15%	181	2.67%
Infectious diseases	318	2.75%	163	2.40%
Headaches	132	1.14%	89	1.31%
Allergies	128	1.11%	109	1.61%
Musculoskeletal	125	1.08%	77	1.14%
Cardiovascular	101	0.87%	65	0.96%
Malignancies	59	0.51%	43	0.63%
Meningoencephalitis	48	0.41%	42	0.62%
Genitourinary	46	0.40%	74	1.10%
Death	29	0.25%	24	0.35%

CONCLUSION

All interventions of emergency medical services carried out by the Teaching Institute for Emergency Medicine of the City of Zagreb over a five-year period, from 2011 to 2015, were analysed, and statistically processed. We comprised all intervention of emergency medical services for children aged 0-18 years of age. The analysis of the data obtained, seen a significant drop in

the number of field interventions involving children in the period from 2014 to 2015, compared to the previous three years (2011 to 2013). This is mostly a consequence of a fall in the number of traumatized children during the same period of research, as a result of better prevention, as well as the education of children, parents and the entire population. Also there is a noticeable reduction in the number of interventions correlated with acute alcohol-

ism of about 15 % during the last analysed period, which can also be attributed to the intensive training, and implementation of educational programs. Also observed was inadequate ICD disease classification, which requires further education of medical staff to adequately complete all data for medical documentation.

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