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PATIENT UNDER 18 YEARS OLD IN THE PRACTICE OF ACTIVITIES OF THE VOIVODSHIP EMERGENCY MEDICAL SERVICE IN KATOWICE IN THE YEARS 2014-2017

SUMMARY

INTRODUCTION

The National Emergency Medical System consists of three basic areas, which include the Medical Dispatch Office, the Medical Rescue Team together with the Aviation Medical Rescue Team and the Hospital Emergency Department. Medical Rescue Teams are managed by a medical dispatcher after collecting a medical history and determining

a medical emergency. Upon arriving at the place of the incident, the Medical Rescue Team implements medical rescue activities, and then in most cases a patient is transported to the Hospital Emergency Department. In interventions conducted within the National Emergency Medical System, pediatric patients are also encountered at the scene of an incident.

The issue of a pediatric patient in pre-hospital care is rarely presented in the medical literature. This results in a small amount of scientific data collected as part of the operation of the Medical Rescue Teams. The research carried out as part of the operation of the Voivodship Emergency Medical Services in Katowice, which provides emergency services for 2.7 million inhabitants of Poland, will significantly contribute to the expansion of knowledge in the field of pediatric patient care and will certainly contribute to the improvement of medical rescue activities performed by the Medical Rescue Teams.

PURPOSE

The aim of the study is to analyze the interventions carried out by the Medical Rescue Teams in patients under the age of 18 in the operational area of the Voivodship Emergency Medical Services in Katowice in the period from January 1, 2014 to December 31, 2017.

METHODS

The medical documentation of Specialist and Basic Medical Rescue Teams of the Voivodship Emergency Medical Services in Katowice in the period from 01/01/2014 to 31/12/2017 (n=974839) was subject to retrospective analysis. The study included those in which the intervention of the Medical Rescue Teams concerned a patient under the age of 18 (n=53643). The demographic data of the incidents in which a patient was under the age of 18 were subject to detailed analysis, in particular gender, age and grouping by cities / counties. The medical documentation was analyzed in terms of the main categorized reason for the emergency call together with the urgency code and the method of visit completion. The interventions carried out by Specialist and Basic Medical Rescue Teams were divided into years, months and time of day. The time of day is divided into 4 time zones: 0:00 - 5:59, 6:00 - 11:59, 12:00 - 17:59 and 18:00 - 23:59. The entire analysis was divided into 4 age groups:

- a group of newborns and infants up to the age of one,
- a group of children from 1 to 8 years old,
- school age group of 8-13 years old,
- adolescent age group from 13 to 18 years old.

First, the activities of the members of the Medical Rescue Teams were reviewed in terms of the type of examination and medical rescue activities performed, distinguishing critical parameters for the respiratory, circulatory and nervous systems.

In the examined medical documentation, an additional division was made into the so-called non-traumatic and traumatic patients. This division was made on the basis of the diagnosis categorized in ICD-10.

The calculations were made using the Statistica package and Excel spreadsheet.

RESULTS

On the basis of the date of birth, visits to patients under the age of 18 by Medical Rescue Teams were selected, which accounted for 5.38% of the total interventions in the analyzed period. The Basic Medical Rescue Teams was most often sent to pediatric patients. In this study, there was a decline in the summer months, i.e., July and August. The average number of interventions for 10 months was calculated, i.e., January-June and September-December (n=2322,75) and the average number of interventions for July and August (n=1797). A comparison of the average numbers showed a decrease in interventions during the holiday season by N=22,63%.

Then, patients under 18 were divided into 4 age groups. It was observed that in groups I and III there was no statistical significance in relation to the intervention in a given part of the day and a given year during the study period. However, in groups II and IV, this significance is high and amounts to (p=0,016) in group II and (p= 0,028) in group IV. When analyzing calls for Specialist Medical Rescue Teams in comparison to Basic Medical Rescue Teams at various times of the day, we can see that in the night hours, i.e., 00:00 - 5:59 in the first three age groups, the most frequently used medical unit is a Specialist Medical Rescue Team: group I (69% vs. 31%), group II (64% vs. 36%) and group III (57% vs. 43%). There is a high statistical significance in each age group.

During the division into non-traumatic and traumatic patients, it was observed that the most common medical intervention was among non-traumatic patients. The fewest number of injuries was found in group I, and the largest number in group III. The greatest difference between EMS interventions among non-traumatic and traumatic patients was observed in group I in 2017 (75,97% vs. 24,03%). The smallest difference between EMS interventions among the above-mentioned patients was observed in group III also in 2017 (52,76% vs. 47,24%).

Another analysis was carried out on the performance of medical rescue operations by the Medical Rescue Team during the intervention in patients under the age of 18. The following activities include suction, ventilation with a self-inflating bag, use of an oropharyngeal tube, endotracheal intubation, connection of a ventilator, use of passive oxygen therapy, heart massage, electrocardiography (ECG), defibrillation, intravenous access, application of an orthopedic collar, use of a vacuum mattress, immobilization and application of a dressing. The presented material showed statistical significance in each age group in the use of oxygen therapy (group I p=0,01, groups II-IV p<0,001), immobilization (group I p=0,004, groups II-IV p<0,001) and the use of a dressing (groups I-IV p <0,001). In age groups II, III and IV, statistical significance was observed in activities such as performing an ECG (group II p=0,007, groups III-IV p<0,001), putting on an orthopedic collar (groups II-IV p<0,001) and using a mattress vacuum (group II p=0,032, group III p=0,005 and group IV p<0,001). In individual medical rescue operations, the significance was observed in group IV in heart massage (p=0,026) and in obtaining intravenous access (p<0.001) and in group II in the suction activity (p=0,047).

The end of the emergency call in the study group was analyzed statistically, broken down into non-traumatic and traumatic. It has been observed that the largest number of patients is transported to the hospital. A comparison of percentage differences was used with the division into non-traumatic and traumatic: transport to the hospital (62% vs. 38%), providing

help at the scene of an emergency call (85% vs. 15%), lack of consent to transport to the hospital (71% vs. 29%), transfer to another medical service (81% vs. 19%) and death (77% vs. 23%). There is very high statistical significance in each age group (p <0,001).

When analyzing vital signs, first of all, in each of the six tested components, i.e., the number of breaths per minute, saturation, the number of pulses per minute, systolic pressure, the Glasgow Coma Scale and the level of glucose in the blood, a division was made into the number of critical parameters, the number of normal parameters and the number of non-tested parameters. Then, these values were compared with individual age groups by years during the study period. Only the tested parameters were subject to statistical analysis. In the analysis, the most studied vital parameter was the Glasgow Coma Scale (GCS) in group II (p=0,343), group III (p=0,73) and group IV (p=0,065), whereas in group I the number of breaths was (p=0,583). When analyzing the most frequently tested parameters, no statistical significance was found. Blood glucose level was the least frequently studied parameter in each age group. In the youngest group, no statistical analysis was performed for this parameter due to the lack of critical parameters during the study period. In group II (p=0,067), in group III (p=0,629) and in group IV (p=0,853) and there was also no statistical significance here. The most common critical parameter in each age group was the Glasgow Coma Score. Another critical parameter occurred during the measurement of saturation in each age group. The statistical analysis shows high significance in group III (p=0,009), in group I (p=0,061), whereas group II (p=0,715) and group IV (p=0,13) showed no significance. On the other hand, the rarest critical parameter in group I occurred in the assessment of the number of breaths (p=0,583), in the other groups it occurred in the measurement of systolic blood pressure. During the statistical analysis group II (p=0,002) and group IV (p=0,037) showed statistical significance. In the further statistical analysis related to life parameters with the division into age groups in relation to years, one more statistical significance was observed. It occurred when examining the number of heart rate per minute in group IV (p=0,012).

CONCLUSIONS

Patients under the age of 18 constitute a challenge for Medical Rescue Teams due to a very small number of interventions, which results in the lack of experience in performing examinations and implementing medical rescue activities. The main reasons for the intervention of EMS Teams among pediatric patients are illnesses in each age group. In the study, there was a correlation in the intervention of Medical Rescue Teams in given months, times of day, age and gender. In the age group of 8-13-year-olds and 13-18-year-olds, the number of interventions

decreases during the holiday months, as well as at night; more often interventions of EMS teams concern patients of the male sex. Among patients under the age of 18, the overwhelming majority requires transport to a hospital, but there are also situations when a patient does not require transport to a hospital, or his legal guardian does not give their consent to it. EMS teams do not test vital signs properly. EMS teams test vital signs on average in half of the pediatric patients. However, the main factor influencing the performance of medical rescue activities is the patient's age and the reason for the intervention. An increase in the activities performed was observed in older patients, especially in the age group 13-18. There is a correlation between a traumatic and a non-traumatic patient in terms of age and gender. The highest ratio of injuries to illnesses was observed in the group of patients aged 8-13, whereas the lowest ratio in the group aged 0-1. In the age group of 13-18-year-olds, there was a clear dominance of interventions among non-traumatic patients of the female sex.

KEY WORDS: emergency medical teams, pediatric patient, Voivodship Rescue Service in Katowice, dispatcher medical, urgency code, operating district, medical rescue operations.