An Injury and Characteristics of An Analysis of Child Care Traffic Accidents in An Educational Research Hospital Applying to Emergency Department

Bir Eğitim Araştırma Hastanesinin Acil Servisine Başvuran Çocukluk Çağı Trafik Kazası Sonucu Oluşan Yaralanmalar ve Özellikleri

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Abstract: We aimed to define risk factors of childhood traffic accidents in order to plan protective preventions in these cases. 16 years old and younger patients who were admitted to an emergency department of a training and research hospital within a two-year period due to traffic accident were examined retrospectively. Age, gender, time of the accident, occurrence of the accident, region of the injury, type of injury and clinical follow-up of these cases were investigated. 564 cases who were admitted to the emergency department due to traffic accident were included to study. Examinig the seasonal period of the accident we determined that most of these accidents (n=225, 39,9%) occured in the summer period. The most frequently visited day was found to be Monday (n = 99, 17.6%). Examining the distribution of time during the day, the most common admission period was found to be between 18.00 p.m. and 18.59 p.m. According to the forms of occurrence of traffic accidents, the largest group consisted the accidents in-vehicle traffic accident (n = 321, 56.9%). Head and neck region of the body (n = 117, 20.7%) was the most affected body region, followed by the extremities (lower extremity n = 106, 18.8%, upper extremity n = 64, 11.4%). Contusion, abrasion, hematoma and crush injuries were the most common injuries. It was determined that the cases who were dead constitute 0.7% of all cases and the majority of them occurred due to in-vehicle traffic accident. In this study, we determined that most of the traffic accidents were caused by in-vehicle traffic accidents. Considering the time of occurrence of these accidents, it was found that the measures to be taken occurred during the children's school hours and playing times outside especially in summer. It would be useful to plan the preventions to be taken based on these data.
Key Words: childhood traffic accidents, emergency department, risk factors

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Özet: Bu çalışmada çocukluk çağı trafik kazasına maruz kalan olgular incelenerek risk etmenleri tanımlanmaya çalışıldı. Bu etmenlerin belirlenmesi sonucunda koruyucu önlemlerin alınması yönünde yapılacak olan çalışmalara katkı sağlamak amaçlandı. İki yıllık süre içerinde bir eğitim araştırma hastanesi acil tıp kliniğine, trafik kazası sebebi ile başvuru yapan 16 yaş ve altı olgular geriye dönük olarak incelendi. Bu olguların yaş, cinsiyet, kazasının oluş zamanı, kazanın oluş şekli, yaralanma bölgesi, yaralanma tipi ve klinik takipleri araştırıldı. Çalışma süresi içerisinde acil servise trafik kazası sebebi ile (16 yaş ve altı) 564 olgunun başvuru yaptığı tespit edildi. Olguların mevsimsel olarak dağılımına bakıldığında büyük bölümünün yaz döneminde meydana geldiği görüldü (n=225, %39.9). En çok başvuru yapılan gün pazartesi (n=99, %17.6) olarak bulundu. Gün içerisindeki zamansal olarak başvuru dağılımına bakıldığında ise en sık başvuru 18.00 – 18.59 zaman diliminde olduğu tespit edildi.Oluş şekillerine göre en büyük grubu araç içi trafik kazaları oluşturdu (n=321, %56.9). Etkilenen vücut bölgesi olarak da en fazla baş boyun bölgesi (n=117, %20,7) bunu ekstremite bölgelerinin (alt extremite n=106, %18,8 – üst ekstremite n=64, %11,4) takip ettiği görüldü. Yaralanma tiplerinden en sık kontüzyon, abrazyon, hematom ve ezilme tipindeki yaralanmalar tespit edildi. Hayatının kaybeden olgular ise tüm olguların % 0.7 sini oluşturduğu ve büyük çoğunluğu araç içi trafik kazası nedeniyle meydana geldiği tespit edildi. Bu çalışmada çocukluk yaş grubu trafik kazalarının büyük çoğunluğunun araç içi trafik kazaları sebebiyle olduğu tespit edildi. Bu kazaların meydana gelme zamanları dikkate alındığında ise alınacak olan önlemlerin çocukların okul çıkış saatlerinde ve oyun zamanlarında meydana geldiği bulundu. Alınacak olan önlemlerin bu verilere dayanarak planlanmasının faydalı olacağını düşünmekteyiz.
Anahtar Kelimeler: çocukluk çağı trafik kazaları, acil servis, risk faktörleri

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1. Introduction

It is estimated that more than two million people lost their lives because of traffic accidents every year in the World. In the European Union (EU), traffic accidents in one year reported 1,5 million injuries and 50,000 deaths (1). The injuries that result from traffic accidents constitute a very important problem in terms of public health. Traffic accidents, especially during childhood, are at the forefront of preventable health problems (2). It has been reported that a significant proportion of deaths between 2 and 14 years of age are due to traffic accidents and at least half can be prevented by simple measures such as seat belts and child car seats (3,4).

The rate of children who are 0-14 years old in Turkey is 14,7% per year in terms of loss of traffic accident survivors. Considering that this ratio is 4,09% in Germany, 5,86% in the UK, 6.59% in the USA and 2,89% in Greece, it can be said that children can not do anything about traffic education and traffic safety in our country are also missing or wrong (5).

Scientific studies investigating the effects of traffic accidents on the childhood age group in our country are limited. In a study conducted in primary school children, it was reported that a significant number of traumas in this age group resulted in traffic accidents (38,3%) (6).

In a study that investigated deaths related to head trauma in childhood, it was determined that the traffic accidents in the etiology took place in the first plan and the important part of them was caused by traffic accidents outside the vehicle (7).

In this study, physical effects and results of traffic accidents on children were researched, data about risk factors were tried to be obtained and suggestions for prevention were presented.

2. Materials and Methods

Trauma cases of children aged 16 years or younger who were admitted to the Emergency Department of an education and research hospital due to traffic accidents in a two year period between 01.12.2015 and 31.12.2017 were examined retrospectively. The cases that were not complaints after the accident and brought to the emergency service for the preparation of the judicial report were excluded from the study.

Patient follow-up forms and emergency archived reports of the cases were delivered to the emergency department. Age, gender, timing of the accident, arrival to the hospital, type of accident, area of injury, type of injury and clinical outcome were investigated. All the data obtained in the study were recorded and evaluated in the standard program "Statistical Package for Social for Windows 16". Numerical variables were summarized as mean ± SD, catagoric variables as number and percentage. The necessary permissions for the work were obtained from the Hospital Management Department of the Kutahya Evliya Celebi Training and Research Hospital.

3. Results

During the study period, 564 cases that applied to emergency services and matched the study criteria were identified. The mean age of all groups was 9,6 ± 4,5 (min 1- max 16). 350 (62,1%) of the cases were male and 214 (37,9%) were female. Temporal characteristics of the applicants were investigated in terms of month, day, and hour and it was found that they were peaking in August (n = 84, 14,9%) and mostly in summer (June, July, August). The most frequent cases were on the Monday (n = 99, 17,6%). The hours were 18.00 - 18.59 and 14.00 - 14.59 were the most intense times of the applicants. In-Vehicle traffic accidents (IVTA) were the largest group (n = 321, 59,9%). This was followed by traffic accidents outside the vehicle (OVTA), bicycle and motorcycle accidents respectively. It was determined that the mean age of the cases exposed to IVTA was lower than the other groups (8,5 ± 4,8) (Table 1). It was determined that the cases were frequently brought by ambulance when the form of emergency service was examined (n = 337, 59,8%). Two hundred and twenty-seven (40,2%) of the cases were found to be brought by private vehicle. When the injury

region were examined, it was found that the head and neck region (n = 117,% 20,7) and the extremities (lower extremity n = 106,% 18,8 - upper extremity n = 64,% 11,4) were the most affected regions. (Table 2). Contusion, abrasion, hematoma and crush type injuries were the most common type of injuries (n=314, 55,7%) (Table 3).

It was found that 4 cases lost their lives in all cases. It has been determined that a large part of them have been realized due to IVTA. The mean age of the cases with IVTA was 7,2 ± 4,9. A significant proportion of the cases in the study group were responded to emergency services and discharged afterwards (n = 463, 87,4%). Forty-five of the cases (8%) were admitted to various services in the hospital (Table 4). Most of the hospitalized patients were admitted to the orthopedics and traumatology department due to extremity injuries (especially fractures) (n=36, 6,4%).

Table 1.
Causes of Accidents and Mean of Age

Causes of Accidents	n	%	mean of age	Min	Max
In vehicle traffic accidents (IVTA)	321	56,9	8,5± 4,8	1	16
Out vehicle traffic accidents (OVTA)	148	26,2	10,3±3,6	1	16
Bicycle accidents	53	9,4	11,1±3,7	5	16
Motorcycle accidents	38	6,7	14±2,5	7	16
Tractor accidents	4	0,7	9,2±4,2	4	14
Total	564	100	9,6±4,5	1	16

Table 2.
Distribution of Injury Regions

Region of Injury	n	%
Head and neck region	117	20,7
Lower extremity	106	18,8
Upper extremity	64	11,4
Head and neck– lower extremity	51	9
Head and neck – thorax	51	9
General body trauma (3 and more regions)	50	8,9
Head and neck – upper extremity	25	4,4
Upper extremity – lower extremity	22	3,9
Thorax – lower extremity	21	3,7
Thorax and back region	15	2,7
Thorax and abdomen	14	2,5
Thorax– upper extremity	11	2
Abdomen	8	1,4
Abdomen – lower extremity	5	0,9
Head and neck– abdomen	4	0,7
Total	564	100

Table 3.
Type of injuries

Type of injury	n	%
Contusion, abrasion, hematoma, crush	314	55,7
Cutting and drill injuries, graze, amputation	149	26,4
Dislocation, broken	82	14,5
Sprain / Strain	19	3,4
Total	564	100

Table.4.
Consequences of The Cases

Consequences of The Cases	n	%
Discharged	493	87,4
Hospitalization	45	8
Referred	22	3,9
Exitus	4	0,7
Total	564	10

4. Discussion

Traffic accidents are the most frequent cause of death in childhood and take the first place among traumatic causes of hospitalization (8). Looking at the 2013 road statistics and child statistics published by the Turkish Statistical Institute(TSI), it is seen that those involved in the accident are grouped as drivers, passengers and pedestrians. In addition, accidents were grouped as motorcycles, cars, minibuses, vans, trucks, tractors, buses and tractor accidents, and no bicycle accidents were included (9).

In our work, this grouping was carried out as a motorcycle, bicycle and tractor accident because of in-vehicle traffic accidents, non-vehicle traffic accidents and a special group as we practically used them. The largest group formed traffic accidents in the car. No additional information is available regarding the consequences of injuries. Accordingly, in 2013, 413 children (11,2%) died and 48307 children (17,6%) were injured in traffic accidents between the ages of 0-17 years (10).

The majority are still boys. 202 (48,8%) of the child deaths are in the 0-9 age group. Pedestrian deaths were observed at 35,8%. Our study supports this data as age range and gender. However, 70% of the deaths were due to IVTA. The reason for this discrepancy may show that the measures taken are regionally different.

In the study performed by Küçüker and his colleagues, 41,8% of the injuries were due to IVTA and 41,2% were due to OVTA; In this study, 56,3% of morbidities and 75% of mortalities are due to IVTA (11). In addition, 63,4% of those exposed to AITC; 60,2% of those exposed to OVTA and 59,4% of those exposed to other vehicle accidents were male. Seriken and colleagues achieved a similar result in their five year study (12).

62.1% of the children who were exposed to traffic accidents in our study were males. Boys spend more time outside the home than girls. The socioeconomic environment in which the child is living is another factor that increases the likelihood of accidents. Children who are raised in an environment with poor socioeconomic environment are more exposed to accidents and this does not result in the creation of safe places such as parks for outdoor activities (pavement regulation, traffic lights, road quality, driver's cultural level etc.) (12, 13). Traffic lights, traffic signs, traffic officers, or non-banking roads in the TSI data show higher accidents. I also have not seen any data about children. Tora et al. and Varol et al. Reported that deaths due to

traffic accidents are mostly due to head trauma (14, 15).

In our study, the largest part of the cases (20,7%) also caused injuries in the head and neck region. Subsequently, lower limbs (18,8%) and upper limbs (11,4%) were injured respectively. Most injured patients have head and neck trauma, supporting other studies.

Traffic accidents occurring in our country have been observed mostly in summer and least in winter [4]. In this study, it was determined that 39,9% of the accidents occurred in summer and 13,8% occurred in winter in accordance with other studies. Based on this result, it is thought that extra measures regarding traffic should be taken in summer (9).

5. Conclusıon

In conclusion, we found that IVTA in our study were more likely to have mortality and morbidity in the pediatric age group than the other accidents, and that the central nervous system damage was the most common. Although measures such as attaching safety belts and child restraints in IVTA reduce the possibility of central nervous system damage, there is no such chance in OVTA. Being a boy invites an accident. When combined with the information provided in the road statistics of the Turkish Statistical Institute, these results raise questions about the adequacy of pedagogy and pedestrian conditions given to children, especially boys, in traffic laws. The data for children should be further elaborated on the cause to try to reduce the deaths and injuries in the accident.

Limitation

Because of retrospect as a result of this study, we could not evaluate whether the patients who were brought to the Emergency department used a safety belt and the time between the time of occurrence of the accident and the time of arrival in the Emergency department.

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