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Original Article *Özgün Araştırma*

ANALYSIS OF TRAFFIC ACCIDENT VICTIMS ADMITTED TO INTENSIVE CARE UNIT IN THE PROVINCE OF KIRSEHIR FROM MAY, 01, 2016 TO MAY, 01, 2018: A RETROSPECTIVE STUDY

Kırşehir İlinde Trafik Kazası Nedeniyle Yoğun Bakım Ünitesinde 1 Mayıs 2016 – 1 Mayıs 2018 Tarihleri Arasında Yatan Hastaların Analizi: Retrospektif Çalışma

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ABSTRACT

Objective: To present the epidemiologic data of traffic accident victims hospitalized at an intensive care unit.

Material and Methods: Medical files of patients admitted to hospital as a traffic accident victim and hospitalized at intensive care unit from May 01, 2016 to May 01, 2018 were retrospectively analyzed. Age, gender, admission time, type of trauma, mechanical ventilation, and surgery were recorded.

Results: Of the 99300 patients hospitalized due to traffic accidents, 86 patients needed intensive care unit care. Mean age of the patients was 41.80 ± 23.04 years. Fifty-five patients were male, and 31 patients were female. Sixty-two patients were under 60 years of age. Intensive care unit hospitalization was most frequent (39 patients, 45.3%) between 08:00-15:59 hours. Multiple trauma patients constituted 38.4% of the cases. Mean length of stay at the intensive care unit was 2.94 ± 4.01. Of the 86 patients; 51 were transferred to the wards, 14 transferred to a reference hospital, one discharged and 20 patients died.

Conclusion: Although patients admitted to intensive care unit due to traffic accidents constitute a small percentage, they still have a high mortality rate. Increasing measures of control at times when traffic accidents are common can prevent deaths in productive age groups.

***Keywords**: Traffic accident, intensive care unit, vehicle, trauma*

ÖZ

Amaç: Bu çalışmanın amacı yoğun bakım ünitesinde trafik kazası nedeniyle yatan hastaların epidemiyolojik verilerini sunmaktır.

Gereç ve Yöntemler: 01 Mayıs 2016 – 01 Mayıs 2018 tarihleri arasında trafik kazası nedeniyle hastaneye başvuran ve yoğun bakım ünitesinde takip edilen hastaların tıbbi dosyaları geriye dönük olarak incelendi. Hastaların yaşı, cinsiyeti, yoğun bakım ünitesine kabul zamanı, travma tipi, mekanik ventilasyon ihtiyacı, acil cerrahi müdahale gerekliliği kaydedilmiştir.

Bulgular: Trafik kazası nedeniyle 99300 hasta hastaneye başvurmuş ve 86 hasta yoğun bakım ünitesine yatırılmıştır. Hastaların ortalama yaşı 41.80±23.04 idi. Hastaların 55'i erkek 31'i kadındı. Altmış iki hasta 60 yaşından küçüktü. Yoğun bakım ünitesine yatışın en sık olduğu zaman dilimi 08:00–15:59 saatleri arasındaydı (n=39, %45). Çoklu travma hastaları vakaların çoğunluğunu oluşturdu (%38.4). Yoğun bakım ünitesinde ortalama yatış süresi 2.94±4.01 gündü. Seksen altı hastadan 51'i servise nakledildi, 14'ü ileri bir merkeze sevk edildi, 1 hasta taburcu edildi ve 20 hasta öldü.

Sonuç: Ülkemizde trafik kazasına bağlı yoğun bakım ünitesinde yatan hastaların oranı düşük olsa da hala yüksek mortaliteye sahiptir. Trafik kazalarının sık olduğu zaman dilimlerinde önlemlerin artırılması üretken yaşta ölümleri önleyebilir.

***Anahtar Kelimeler**: Trafik kazası, yoğun bakım ünitesi, taşıt, travma*

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INTRODUCTION

Traffic accidents are injuries caused by a vehicle crash on a public road and are the leading cause of accidental injuries in the world (1-3). Traffic accidents are still one of the most critical public health problems in developing countries as in Turkey (1,3,4). Annually twenty to fifty million people are injured in traffic accidents worldwide, and more than a million of them die.

Since traffic accidents are preventable causes of injuries and deaths, increasing precautions against the occurrence of traffic accidents may decrease its incidence. Determining the most frequent time that traffic accidents occur is essential for planning the preventive measures. Moreover, increasing the penal sanction of traffic laws may be useful in decreasing the occurrence of traffic accidents.

The present study aims to obtain statistical data, assess the demographic characteristics, and present the epidemiologic data of traffic accident victims who were admitted to hospital due to a traffic accident and hospitalized in the intensive care unit (ICU).

MATERIALS AND METHODS

After obtaining institutional board consent and ethical committee approval (Date: 31.07.2018, number: 2018-15/117) the current study was retrospectively designed to assess the medical files of eighty-six patients hospitalized at intensive care unit of Ahi Evran University Training and Research Hospital, a tertiary affiliation hospital, due to traffic accidents from May 01, 2016 to May 01, 2018. During the study period, 99300 patients were admitted to Ahi Evran University Training and Research Hospital as a traffic accident victim and total ICU admissions were 2641 during the same period.

Study Group Determination and Data Collection

Medical files of the patients hospitalized in ICU from May 01, 2016 to May 01, 2018 were analyzed to determine the patients that were admitted as a traffic accident victim. The number of patients admitted to our hospital in the same period was also determined from the medical files of the patients. Demographic characteristics of patients as age, gender, time of admission to ICU, the month and the season during which the traffic accident happened, traumatized body region(s), type of trauma (either single-site or multi-trauma), discharge status from ICU, whether the victim was in the vehicle or out of the vehicle during the accident, length of stay at ICU were determined and recorded for statistical analysis.

Statistical Analysis

Data obtained from the medical files of eighty-six patients were analyzed. IBM SPSS version 20.0 (IBM SPSS, Inc., Chicago, IL, USA) was used to analyze the data of the current study. Demographic data were expressed as mean, standard deviation, median, percentages or numbers as appropriate.

RESULTS

Data obtained from medical files of eighty-six patients hospitalized at the ICU as a traffic accident victim were included in the present study. Of the eighty-six patients, fifty-five patients (64%) were male, and thirty-one patients (36%) were female. Mean age of the patients was 41.8 ± 23.04. Eighteen patients (20.9%) were under the age of eighteen, and sixty-eight patients (79.1%) were adult. Patient characteristics are presented in Table 1. Distribution of patients according to age groups is presented in Figure 1.

The incidence of traffic accidents was higher in summer (32.5%). Traffic accidents were most frequent in July (n=15, 17.4%). The distribution of patients according to months of the year is presented in Figure 2. Most of the accidents happened in 2017 (n=37, 43%). The incidence of patient admission to ICU was most frequent at 16:00-16:59 hours (n=8, 9.3%). No patient admission was determined between 05:00-08:59

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hours. Thirty-nine patients (45.3%) were accepted to ICU between 08:00-15:59 hours and fifteen patients (%17.4) were accepted to ICU during the night shift (Table 2).

Table 1: Patient Characteristics

Patient Characteristics		n	%
Age(y), (mean ± SD)	41.80 ± 23.04		
Gender	Male	55	64
	Female	31	36
Patient Admission Year	2016	31	36
	2017	37	43
	2018	18	21
Need for Mechanical Ventilation	Yes	24	27.9
	No	62	72.1
Need for Emergent Surgery	Yes	40	46.5
	No	46	53.5
Patient Position	In-vehicle	79	91.9
	Out of vehicle	7	8.1
Discharged as	Transported to ward	52	60.4
	Transported to a reference center	14	16.3
	Exitus	20	23.3

Minimum length of stay at the ICU was one day (n=50, 58.1%) and maximum length of stay was twenty-five days (n=1, 1.2%). Mean length of stay was 2.94±4.01 days. Eighty-one patients (94.2%) stayed at the ICU less than ten days (Figure 3).

Thirty-three patients (38.4%) had multi-trauma, and fifty-three patients (61.6%) had single-site trauma (Table 3). Head trauma was the leading cause of single-site injuries (n=23, 26.7%) whereas urogenital injury was determined in one patient as a single site injury after a traffic accident.

Table 2: Distribution of patients according to the time of hospitalization to the intensive care unit

ICU admission time	**(n)**	**%**
24:00-07:59	15	17.4
08:00-15-59	32	37.2
16:00-23:59	39	45.4
Total	86	100.0

Table 3: Distribution of patients according to the trauma sites

Trauma Type	**Trauma site**	**(n)**	**%**
Single site trauma	Head and neck (HN)	23	26,7
	Extremity (Extr)	11	12,8
	Chest (CS)	8	9,3
	Abdomen (Abd)	7	8,1
	Soft tissue (STT)	3	3,5
	Genitalia (Gen)	1	1,2
Multitrauma	More than one site	33	38.4
Total		86	100

Forty-six patients (53.5%) did not need surgical intervention, but forty patients (46.5%) underwent emergent surgery. Of the forty patients that were operated, 97.5% (n=39) were in the vehicle during the traffic accident, but only 2.5% (n=1) of the patients who was injured out of the vehicle needed emergent

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surgical intervention. Twenty-four patients (27.9%) needed mechanical ventilation during their stay at ICU, but 62 patients (72.1%) did not need mechanical ventilation.

Of the eighty-six patients hospitalized at ICU as a victim of a traffic accident, seventy-nine patients were in the vehicle (91.9%), and only seven patients (8.1%) were out of the vehicle during the traffic accident. Out of vehicle injury, victims were dominantly male patients (6 male vs. one female) whereas in vehicle traffic accident patients distributed evenly (49 male vs. 39 female).

Sixty-six patients were discharged from ICU to the hospital wards or to a reference hospital, but twenty of them died. There were seventy-nine in-vehicle traffic accident victims and their outcomes were as follows: 50 patients (63.29%) were transferred to hospital wards, 14 patients (17.72%) were transferred to a reference hospital, 14 patients (17.72%) died and one patient (1.27%) was discharged to home whereas of the seven out of vehicle traffic accident victims 1 patient (14.28%) was transferred to hospital ward and 6 patients (85.72%) died.

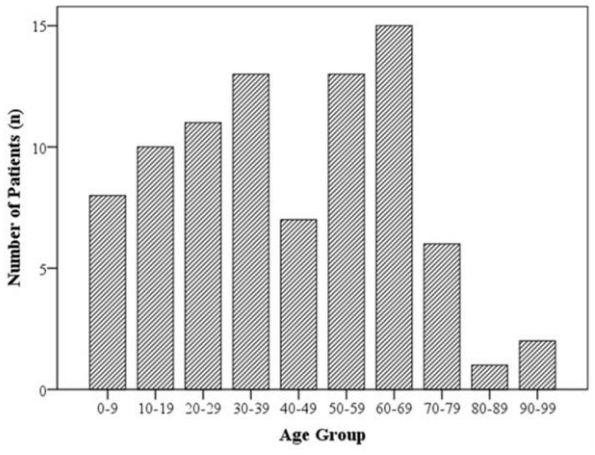

Figure 1: Distribution of Patients According to Age Groups

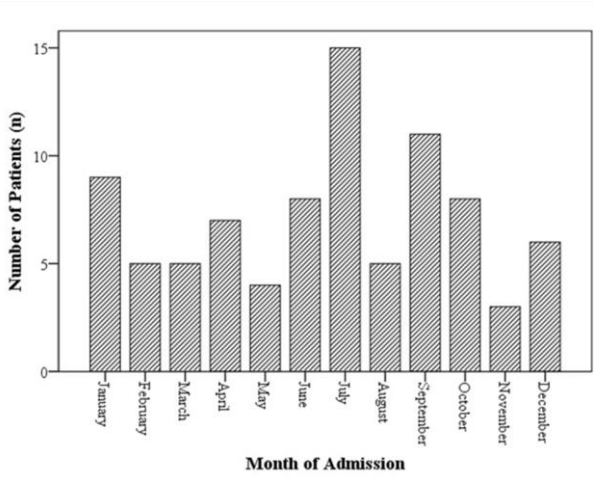

Figure 2: Distribution of Patients According to Intensive Care Unit Admission Month.

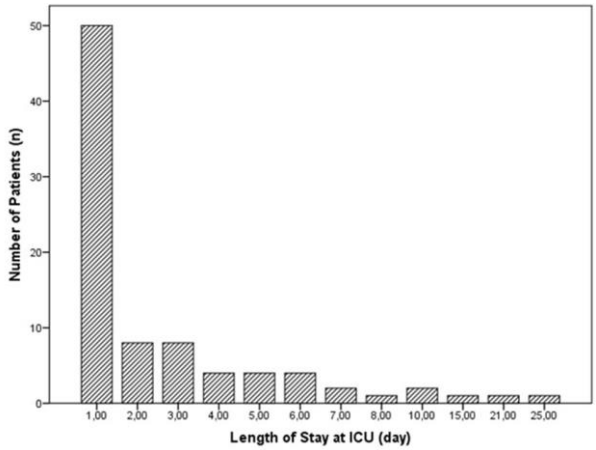

Figure 3: Distribution of Patients According to Length of Stay at Intensive Care Unit

DISCUSSION

Traffic accidents are one of the most common causes of admission to emergency departments of hospitals in developing countries and constitute a significant part of the cause of death also in developed countries (5-8). In the current study, 99300 patients were admitted to hospital because of being injured in a traffic accident. During the same time interval, the number of patients hospitalized at the ICU was 2641 and only 86 of them (3.25%) were hospitalized due to a traffic accident.

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In a study reported from Tanzania by Chalya et al of the eight hundred and forty-one ICU admissions two hundred and twenty-one patients (26.27%) were admitted to ICU due to traffic accidents which is nine times more than the present study (9). The reasons for this difference may be the developmental state of the country, level of traffic education, and the bounds of possibility of the country such as well-established highways, signalization and traffic control.

Beyaztaş et al have reported that the distribution of the male/female ratio of the patients admitted to the emergency department of the hospital due to a traffic accident was 69.84% male/ 30.16% female (10). Meral et al have also reported the distribution of traffic accident cases according to gender as 63.4% males and 36.6% females (11). The results of the present study are in agreement with these studies since we found 64% (n=55) of the patients admitted to ICU due to traffic accident were males, and 36% (n=31) were females.

In the present study, mean age of patients was 41.8±23.04 which is a decade more than the results of Meral et al, Mandıracıoğlu et al, Gören et al, and also the results of studies from foreign countries (2,8,11-17). These previous studies have investigated the admissions to hospital due to traffic accidents. In the present study, a subgroup of patients admitted to hospital due to a traffic accident (patients that need ICU care) was analyzed. With the increasing age, the number of comorbidities increases which distorts the general health condition of the patients and an unexpected trauma (i.e., traffic accident) adds on to the worsening of the health condition of a patient. This may be the reason why mean age of patients admitted to ICU are a decade older than the patients admitted to hospital due to traffic accidents.

Traffic accidents are reported to be more frequent in summer which is coherent for the present study (2,5,11,13,15,17). We determined 32.5% (n=28) of the traffic accidents happened in summer and 17.4% (n=15) of them were in June. The reason of the increased frequency of traffic accidents in summer may be the increased number of patients traveling for a summer holiday in summer, and another reason which may be more important for our province is that expatriates are returning to the homeland in summer which increases the traffic intensity.

Traffic accident victims were most frequently admitted to ICU at 16:00-23:59 time interval (n=39, 45.4%) in the present study. This ratio was consistent with the studies reporting the frequency of traffic accident occurrence in our country (5,11,14-18). The increased frequency of traffic accidents within this period may be due to its overlapping with the rush out time, sunset and the fatigue of the drivers.

Multi-trauma patients constituted 38.4% of patients. In the single site injuries group, head trauma was the leading cause of ICU admissions in our study with a frequency of 26.7% followed by extremity injuries (12.8%). This finding was in contrast with the results of the previous studies reported from Turkey however it is consistent with the results of a recent study reported by Meral et al where he attributed the difference of his results from the former studies to the difference in the study group including in-vehicle or out of the vehicle patient population (11,14,15,17,19,20). In the current study, we included all patients admitted to ICU because of traffic accidents regardless of the traffic accident victim was in or out of the vehicle. The head trauma patients lead in ICU admissions in our country. Other possible explanations may be the inadequate traffic education and resistance against seat belt wearing. Another reason may be the inadequacy of penal sanction of traffic laws and traffic control measures.

In the present study, the overall mortality rate was 23.25% (n=20) which was lower than the studies reported by Chalya et al (32.7%) from Tanzania and

Adenakan et al (53.3%) from Nigeria (9,21). The difference between the results may be explained by the economic, social and cultural development of the countries and the health budget expenditures all of which affect the quality of health services and the outcomes after ICU admissions.

Traffic accident related deaths at ICU are most frequent under the age of 60 which is the productive age group in Turkey. This result is consistent with the results of Sharma et al who reported that traffic accident related deaths are more common under the age of 50 (22). Traffic accidents are a preventable cause of accidental injuries which leads to loss of lives, health budget expenditures, and active working population.

In the present study, the majority of the patients (79 patients, 91.8%) were in-vehicle traffic accident victims, and their mortality rate was 17.72% (14 patients), whereas the mortality rate of out of vehicle traffic accident victims was 85.72%. Although the number of out of vehicle victims is less than the in-vehicle traffic accident victims, their mortality rate is significantly higher. Therefore, measures to prevent out of vehicle accidents should be taken to save lives.

To conclude, traffic accidents are preventable causes of deaths, workforce loss, and increased health budget expenditures in our country. Although the number of ICU admissions due to traffic accidents is decreasing annually, mortality rates are still high. Measures such as increasing traffic controls in summer and especially at rush out times, increasing traffic education and increasing the penal sanction of traffic laws may be helpful to decrease the incidence of traffic accident related ICU admissions.

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*Conflicts of Interest***:** No conflicts of interest to declare.

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