NOFOR
NOVEL FORENSIC RESEARCH

DOI: 10.5455/NOFOR.2024.10.08

NOFOR. 2024;3(2):21-5

Original Article

Evaluation of fatal traffic accident cases that occurred in Tokat province

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Received April 13, 2024; Accepted July 21, 2024; Available online August 15, 2024

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Abstract

Aim: Traffic accidents are one of the important study subjects among forensic medical practices. In our study, it was aimed to evaluate the demographic characteristics of the deaths due to traffic accidents in Tokat province from a forensic perspective and to offer solutions to traffic accidents, which are an important public health problem for our country.

Materials and Methods: In this study, the dead examination and autopsy reports performed on traffic accident cases by Gaziosmanpaşa University Faculty of Medicine Department of Forensic Medicine between January 2013 and January 2018 were retrospectively examined, and a total of 138 cases were examined according to age, gender, scene of incident, place of death, cause of death, vehicle type. , were evaluated in terms of whether the victim was inside/outside the vehicle, driver/passenger/pedestrian, trauma area, bone fractures and the distribution of the cases according to months and years.

Results: In our study, 138 (33.1%) of a total of 419 death examination and autopsy cases performed by our Department between 2013 and 2017 were caused by traffic accidents, the average age of these cases was 45.42 (SD±23.25) and 111 of them were male (80.44%), 27 of whom were women (19.56%), the average age for men was 47.37 (SD±22.32), and for women this number was 37.37 (SD±25.61) and the cases were between the ages of 0-90. There was an increase in fatal traffic accidents in 2016 compared to other years, and when the frequency of occurrence by month was evaluated, it was determined that the most frequent fatal traffic accident was in September.

Conclusion: It was determined that there was an increase in the number of fatal traffic accidents in Tokat province within the specified five years, especially in the summer months, and that urban traffic accidents were more than out-of-city traffic accidents as a result of limited public transportation opportunities and people traveling more with their personal vehicles.

Keywords: Traffic accident, death, autopsy

INTRODUCTION

Traffic; it is defined as the movements and situations of pedestrians, animals and vehicles on the highway. Traffic accident is an important public health problem that results in death, injury and damage involving one or more moving or stationary vehicles or people on the highway [1]. According to World Health Organization 2023 data; every year, approximately 1.19 million people die in traffic accidents in the world and 17.8 million people are seriously injured [2]. According to Institute For Health Metrics And Evaluation 2016 data, one of the top 10 most common causes of death worldwide is traffic accidents, and injuries due to traffic accidents are one of the most common causes of trauma-related deaths [3]. It is reported that the risk of death resulting from a traffic accident is higher than other traumas. Traffic accidents have become the most common cause of trauma-related deaths in young adults [4]. The World Health Organization announced that the most common cause of death for people aged 5-29 in 2023 is traffic accidents [2].

CITATION
Dalgic S, Gulderen A, Sahinoglu Gunes T, Cetin S. Evaluation of fatal traffic accident cases that occurred in Tokat province. NOFOR. 2024;3(2):21-5. DOI: 10.5455/NOFOR.2024.10.08

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DOI: 10.5455/NOFOR.2024.10.08

In this study, we aimed to retrospectively evaluate the autopsy reports of traffic accidents that occurred in Tokat between January 2013 and January 2018, to offer solutions to traffic accidents, which are a serious problem for our country and the world, and to contribute to our country's statistics by examining deaths due to traffic accidents.

MATERIAL AND METHOD

In our study, a total of 419 corpse examination and autopsy reports prepared by Tokat Gaziosmanpaşa University Health Practice and Research Hospital, Department of Forensic Medicine between 2013 and 2018 were retrospectively examined. It was understood that 138 (33.1%) of the cases examined died due to traffic accidents. Demographic characteristics of 138 cases who died due to traffic accidents were evaluated. Cases include age, gender, month and year of death, whether the death occurred at the scene or in the hospital, where the event occurred, whether a death examination or autopsy was performed, cause of death, whether histopathological and/or systemic toxicological samples were taken during the autopsy/examination of the dead, whether CPR was performed or not. The type of vehicle that caused the accident, whether the victim was inside or outside the vehicle, whether the victim was a driver/passenger/pedestrian, whether the accident was one-sided/double-sided, the trauma area of the victim, existing organ damage and bone fractures were investigated. Whether it is compatible with worldwide rates or not was discussed in the light of the literature.

Descriptive analyzes were performed to give information about the general characteristics of the study groups. Data belonging to continuous variables are in the form of mean±standard deviation and median minimum and maximum values; data on categorical variables were given as n (%). Ready-made statistical software was used for calculations (SPSS 22.0 Chicago, IL, USA).

Ethics committee approval was obtained with the decision numbered 24-KAEK-231 by Tokat Gaziosmanpaşa University Faculty of Medicine Clinical Research Ethics Committee.

RESULTS

It was determined that the cause of 138 (33.1%) of 419 forensic death cases, where death examination/autopsy was performed by Tokat Gaziosmanpaşa University Forensic Medicine Department between January 2013 and January 2018, was a traffic accident. It was determined that the youngest of the victims who were examined or autopsied was 8 days old, the oldest was 90 years old, and the average age of all cases was 45.42 (SD±23.25). It was determined that 111 (80.44%) of our cases were male and 27 (19.56) were female, and the average age in our study group was 47.37 (SD±22.32) for men and 37.37 (SD±25.61) for women. It was determined that the number of men was 4.1 times the number of women, and the age and gender distributions are shown in Figure 1. It was observed that 14 of the male cases and 8 of the female cases were under the age of 18, and deaths due to traffic accidents in both genders occurred most frequently in the 60-69 age group.

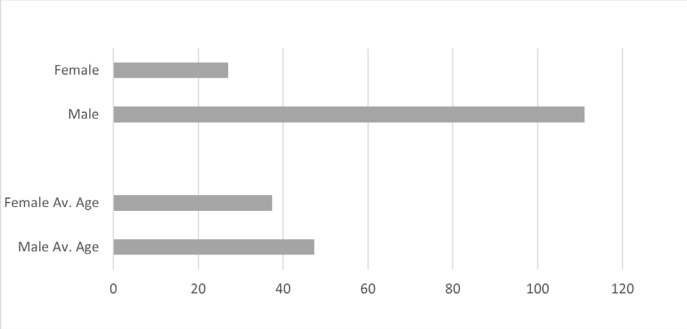

Figure 1. Number of male-female and average age

In our study, it was determined that deaths due to traffic accidents occurred most frequently in 2016, and by month, the most frequent deaths occurred in September. It was observed that there were significantly fewer fatal traffic accidents in the winter months of December, January and February compared to other months, and when evaluated according to seasons, the highest number of deaths occurred in the summer. The distribution of death cases by months is shown in Figure 2.

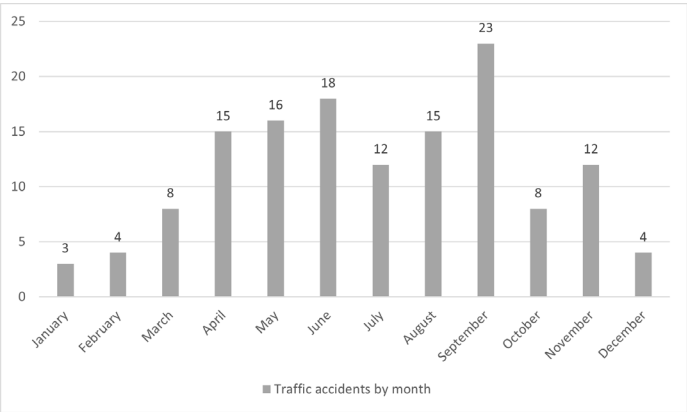

Figure 2. Traffic accidents by month

When the places where accidents occur are evaluated; It was observed that the most fatal traffic accidents occurred in city centers. It was determined that 115 of the cases were hospitalized and 23 cases were declared dead at the scene. It was determined that CPR was applied to 114 of the cases.

It was understood that only dead bodies were examined in 109 of the cases, while autopsy was performed in 29 cases. It was determined that systemic toxicological analysis was requested in 32 of the 138 cases where autopsy or death examination was performed, and both systemic toxicological analysis and histopathological tests were requested in 14 cases, and no examination was deemed necessary in 88 cases.

In our study, it was determined that the most common accident occurred with a car, with 88 cases. It was observed that 24 of the fatal traffic accidents occurred with tractors, 13 with motorcycles, and 11 with trucks, pickup trucks and trailers. It was determined that 72 of the victims were inside the vehicle and 66 were outside the vehicle at the time of the accident. It was determined that 59

DOI: 10.5455/NOFOR.2024.10.08

of the accidents were bilateral. It was determined that 56 victims were drivers, 52 were passengers, and 30 were pedestrians.

When our study is evaluated in terms of causes of death; It was determined that the cause of death was head trauma in 69 cases (50%), head trauma was followed by internal organ damage and internal bleeding in 29 cases, and medulla spinalis injury was in 2 cases. While isolated head and neck trauma was observed in 43 cases, all cases with head and neck trauma, including cases with trauma to more than one region, were observed to be 91. It was determined that 12 cases had trauma only to the chest area, 2 cases had trauma to the abdomen/pelvis area, and 80 cases had trauma to more than one area. In fatal traffic accidents, brain damage was the most common in 57 cases, lung damage in 35 cases, multiple organ damage in 36 cases, bones in the craniofacial bones in 75 cases, ribs and sternum in 63 cases, pelvis in 8 cases, vertebrae in 13 cases, and extremities in 14 cases. It was observed that there were fractures and there were no bone fractures in 9 cases. The distribution by cause of death is shown in Figure 3, and the distribution of bone fractures is shown in Figure 4.

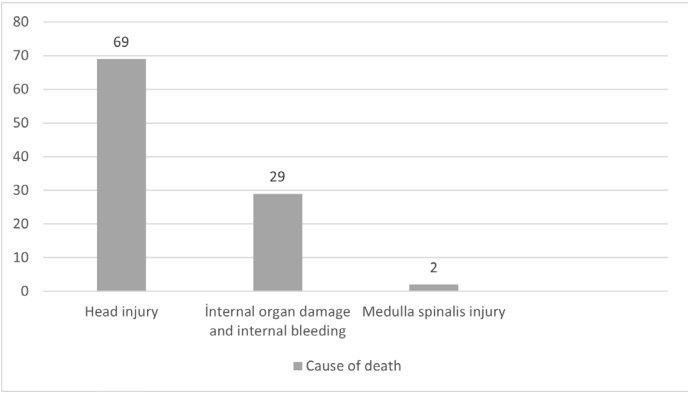

Figure 3. Cause of death

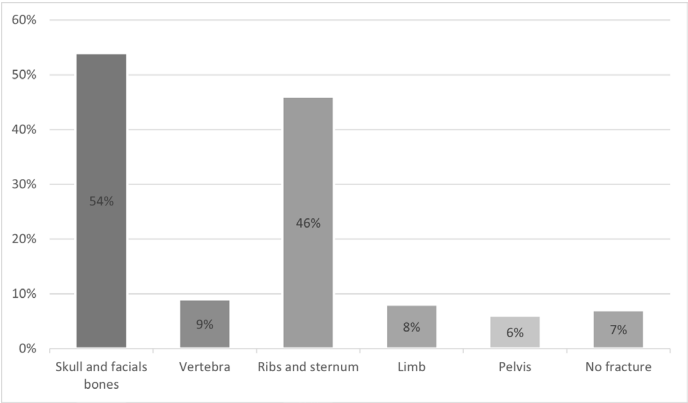

Figure 4. Bone fractures

DISCUSSION

The number of people and vehicles in the world is increasing rapidly every day. Since the most commonly used method of transportation is road, traffic accidents have become a global problem causing significant mortality and morbidity worldwide. According to Turkish Statistical Institute 2023 data, it has been reported that a total of 1,314,136 accidents occurred on our country's highways and 235.71 of these accidents were accidents with injuries and deaths, and a total of 6548 people lost their lives in these accidents [5]. In Tokat province, it was reported that 6016 traffic accidents occurred in 2023 and a total of 84 people lost their lives in these accidents [5]. While the number of motor vehicles in traffic in Türkiye will increase by 8.5% in 2023 compared to the previous year, total number of accidents 6.6%, number of accidents involving death and injury 19%, total death toll is 25% and number of injured 21.5% is reported to have increased [6].

In our study, it was determined that 138 (33%) of 419 forensic cases conducted by our Department in Tokat province in the 5-year period between January 2013 and January 2018 were due to traffic accidents. In the literature, this rate was found to be 22% in a study conducted in Diyarbakır, 38.8% in a study conducted in Eskişehir, and 28% in a study conducted in Denizli [7-9]. A study conducted in India reported that 50% of unnatural deaths in children under the age of 18 were due to traffic accidents [10]. Although there are regional differences, it is reported that traffic accidents constitute approximately 1/3 of forensic cases in our country and traffic accidents generally come first.

In our study, it was determined that 111 (80%) of the cases were male and 27 (20%) were female, and the male/female ratio was determined to be 4.1. In a study conducted in Ankara, it was stated that the rate of men dying in traffic accidents was 72.6%, and in a study conducted in Diyarbakır, it was 75% [7,11]. According to Turkish Statistical Institute 2023 data, it was determined that 75% of those who died in traffic accidents were men and 25% were women [5]. The higher number of male deaths in traffic accidents is due to the fact that men are more present in traffic and the vehicle drivers are mostly men. In our study, the average age was 45.42 in all cases, 47.37 in men and 37.37 in women, and it was observed that death occurred most frequently in the 60-69 age group in both genders. In a study conducted in Denizli, it was reported that the average age was 48.5 and deaths occurred most frequently in the 60-69 age group. In a study conducted in Adana, it was reported that the average age was 37.6 and deaths occurred most in the 0-10 age group [9,12].

When deaths due to traffic accidents were evaluated by month, it was seen that the most deaths occurred in September, in line with studies conducted in Türkiye and around the world. According to Turkish Statistical Institute 2023 data, deaths due to traffic accidents occurred most frequently in July, and according to Turkish Statistical Institute 2022 data, deaths due to traffic accidents occurred most frequently in August [5,6]. It is stated that deaths due to traffic accidents are at least in February [6]. It is thought that the increase in traffic accidents and deaths related to these accidents in the summer months is due to the increase in vehicle and pedestrian density in traffic. In our study, when the deaths due to traffic accidents were evaluated according to the location of the incident, it was seen that the most deaths occurred in city centers with 98 (71%) cases. According to

DOI: 10.5455/NOFOR.2024.10.08

Turkish Statistical Institute 2023 data, 83.1% of traffic accidents involving death and injury occurred in residential areas and 16.9% occurred outside residential areas [5].

In forensic cases, it is critical to perform a systematic autopsy to determine the exact cause of death. Determining the exact cause of death in traffic accidents is of critical importance both in the later stages of the forensic investigation and in eliminating claims that may arise later in insurance cases. However, in practice, it is seen that in traffic accidents, burial licenses are generally issued only after examining the dead. In our study, it was determined that autopsy was performed on only 29 of 138 cases (21%), and the cause of death in 109 cases was determined by examination of the dead. In a study conducted in Ankara, it was reported that 6.2% of the fatalities resulting from traffic accidents were subjected to autopsy, and 93.8% were given burial licenses after examination of the dead [11].

When the vehicles involved in the accident were evaluated according to their types, it was determined that 88 (64%) of the traffic accidents occurred with automobiles. According to Turkish Statistical Institute 2023 data, automobiles rank first in the number of vehicles most frequently involved in accidents involving death and injury and the number of drivers killed. It has been reported that among the vehicle types involved in traffic accidents throughout Türkiye, cars take the first place and motorcycles come second [5]. In our study, it was determined that 72 (52%) of the victims were inside the vehicle at the time of the accident, and 66 (48%) were outside the vehicle. In a study conducted in Istanbul where traffic accidents were evaluated, it was reported that in-car traffic accidents were 51.4%, extra-vehicular traffic accidents were 29.5%, and motorcycle accidents were 16.6% [13]. In our study, it was determined that out of 138 deaths due to traffic accidents, 56 were drivers, 52 were passengers and 30 were pedestrians. 21.7% of all fatalities were pedestrians, and when the vehicles that hit pedestrians were evaluated, it was determined that 21 of them were hit by cars, 4 by trucks or trucks, and 4 by motorcycles. It was observed that 40.5% of all fatalities were caused by drivers, and 35 of the dead drivers were car drivers. It was seen that tractor drivers and motorcycle drivers were following them, respectively.

The body part that is most damaged and causes death in traffic accidents is the skull [14]. In our study, the cause of death was found to be head trauma in 69 cases, internal organ damage and internal bleeding in 29 cases, and medulla spinalis injury in 2 cases. It is known that head and neck injuries are most common in cases of unnatural death [15]. When our study is evaluated in terms of trauma areas, head and neck trauma is the most common with 91 cases (65.9%), in line with the literature, and when the cases with head and neck trauma are evaluated as drivers and pedestrians; It was observed that a total of 35 (62.5%) cases, 12 of which were isolated head and neck injuries among the drivers, and 25 (83.3%) of the pedestrians, had head-neck trauma. In a study conducted in Edirne, it was reported that the head and neck were most frequently injured in in-vehicle traffic accidents (29%), and the extremities were most frequently injured in out-of-vehicle traffic accidents (38%) [16]. In the evaluation of bone fractures detected in our study; It was observed that there were bone fractures in the craniofacial bones in 54% of the cases, in the ribs and sternum in 46%, in the extremities in 10%, in the vertebrae in 9%, in the pelvis in 6%, and in 7% there were no bone fractures. In a study conducted in Diyarbakır, it was reported that the most common fracture was skull fracture with 49%, and in a study conducted in Istanbul, it was reported that the most common fracture was skull fracture with 59% [7,17].

CONCLUSION

As a result, traffic accidents occurring it has a very important place among traumatic deaths all over the world. Evaluating the statistical data presented on traffic accidents and understanding the seriousness of the situation is important for. In order to minimize death and disability due to traffic accidents, necessary precautions should be taken, inspections should be carried out and traffic rules should be obeyed by the society.

Conflict of Interests
The authors declare that there is no conflict of interest in the study.

Financial Disclosure
The authors declare that they have received no financial support for the study.

Ethical Approval
Ethics committee approval was obtained with the decision numbered 24-KAEK-231 by Tokat Gaziosmanpaşa University Faculty of Medicine Clinical Research Ethics Committee.

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