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Evaluation of Forensic Cases Admitted to the Emergency Department: A Retrospective Analysis

Acil Servise Başvuran Adli Nitelikli Olguların İncelenmesi: Retrospektif Analiz

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ABSTRACT

This study was conducted retrospectively to determine the profile of forensic cases admitted to the emergency department of a university hospital. 127242 patients admitted to the emergency department of a university hospital within one year were retrospectively reviewed in terms of age, gender, type of event, the season of occurrence, age, and gender distribution of the type of event. Out of all the forensic cases analyzed, 35.8% (n: 525) were in the 0-14 age group, and 64.7% (n: 949) were males. Admissions were most frequently made in the summer months. The most common forensic diagnoses were exposure to assault/violence, accounting for 29.2% of cases, followed by drug poisoning at 19.1%, and burns at 17.1%. Most cases (66.5%) were discharged after receiving outpatient treatment. It is evident that a substantial number of forensic cases admitted to the emergency department were preventable. To reduce the occurrence of preventable cases, it is essential to implement protective measures both outdoors and at home, creating a safe environment. It is crucial to support and promote education and awareness-raising activities that actively involve families with the support of social institutions. Support and dissemination of education and awareness-raising activities in which families will actively participate by social institutions, raising awareness of society through public service announcements, establishing an understanding that "does not tolerate violence" in preventing and reducing violence at home and in society, and enactment of effective and deterrent laws will be significant steps towards solving the problem of reducing assault/violence.

Keywords: Emergency department, forensic case, university hospital

ÖZ

Bu çalışma bir üniversite hastanesinin acil servisine başvuran adli vaka profilini belirlemek amacıyla retrospektif olarak yapıldı. Çalışmada, bir üniversite hastanesinin acil servisine bir yıl içinde başvuran 127242 hasta, geriye dönük incelendi. Vakalar yaş, cinsiyet, olay türü, olayın meydana geldiği mevsim, olay türünün yaş ve cinsiyete bağlı dağılımı yönünden tarandı. Tüm adli vakaların %35.8'i (n: 525) 0-14 yaş grubunda bulunmakta, %64.7'si (n: 949) erkeklerden oluşmaktaydı. Başvurular en sık yaz aylarında yapılmıştı. En sık görülen adli tanılar sırasıyla darp/şiddete maruz kalma %29.2, ilaç zehirlenmesi %19.1, yanık %17.1 idi. Vakaların çoğunluğu (%66.5) ayaktan tedavi edilerek taburcu edildi. Acil servise başvuran büyük çoğunlukta ki adli nitelikli vakaların önlenebilir nedenlerle oluştuğu görülmüştür. Önlenebilir nedenlerle gerçekleşen başvuru sayısını azaltmak için dış ortamda ve evlerde koruyucu önlemler alınmalı güvenli bir çevre oluşturulmalıdır. Ailelerin etkin olarak katılacağı eğitim ve bilinçlendirme faaliyetlerinin sosyal kurumlar tarafından desteklenerek yaygınlaştırılması, kamu spotları aracılığı ile toplumun bilinçlendirilmesi, evde, toplumda şiddeti önleme ve şiddeti azaltmada "şiddete hoşgörü göstermeyen" bir anlayışın oluşturulması, etkili ve caydırıcı nitelikteki yasaların yürürlüğe girmesi ile darp/şiddetin azaltılması sorunun çözümü için önemlidir.

Anahtar kelimeler: Acil servis, adli vaka, üniversite hastanesi

Ethical approval was obtained from the Karadeniz Technical University Health Sciences Scientific Research Ethics Committee (Number: E-13562490-199-350473-36; No: 2023/24).

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INTRODUCTION

Emergency services serve as primary points of contact for both victims and perpetrators involved in crime and violence incidents, encompassing a significant global health concern.[1] Therefore, emergency services often serve as the initial site for the examination and treatment of forensic cases.[2] Various forms of injuries resulting from firearms, explosive substances, cutting tools, stabbing objects, crushing instruments, traffic accidents, falls, assault, occupational accidents, poisoning, burns, electric and lightning strikes, sexual assaults, mechanical asphyxia, suicide attempts, homicides, suspected accidental deaths, and sudden unexpected deaths fall under the category of forensic cases.[3,4] In Turkey, forensic cases (excluding road traffic and occupational accidents) account for approximately 1-3% of all admissions to emergency departments.[5]

In studies evaluating forensic cases admitted to the emergency department in Turkey, the most common reasons for admission were traffic accidents,[2,4,6-10] violent crimes,[1,6,7] assault,[1,8,9] suicide attempt,[3,6,7,11] poisoning,[1,3,10,12] alcohol/illegal substance use,[3] falls,[7-10] sharp object injuries[9] and animal bites.[10]

In our country, there is a paucity of literature concerning forensic patients who are admitted to the emergency department, requiring the update of statistics and the regular publication of new findings on this subject. Based on this need, this study aimed to make a retrospective evaluation of forensic cases admitted to the emergency department of a university hospital in northeastern Turkey, determine their demographic characteristics, compare their diagnosis at the time of admission, and hospitalization and mortality rates with the current literature, and contribute to the national data.

MATERIAL AND METHOD

Population and sample of the research

The population of the descriptive and retrospective study consisted of cases admitted to the emergency department of a university hospital between March 1, 2022, and March 1, 2023. The sample of the study consisted of case records registered as forensic cases based on the physician's evaluation.

Data Collection

The data were collected through a retrospective examination of forensic case records documented in the emergency department of a university hospital within the period of March 1, 2022, to March 1, 2023. The researchers obtained institutional permission to access and analyze these records. The forensic cases were assessed based on variables such as age, gender, diagnosis, time of admission, hospitalization duration, and mortality rates.

Data Analysis

The data obtained from the study were analyzed with Statistical Package for the Social Sciences (SPSS) 23 software. The data were evaluated using numbers, percentages, and mean± standard deviation.

Ethical Considerations

Ethical approval for this research was obtained from the Karadeniz Technical University Health Sciences Scientific Research Ethics Committee (Number: E-13562490-199-350473-36; No: 2023/24). Permissions were also obtained from the chief physician's office and the Department of Emergency Medicine of the relevant hospital. Informed consent was not required as the study was designed as a retrospective analysis of existing computer and file records. The study was conducted in accordance with the principles outlined in the Declaration of Helsinki.

RESULTS AND DISCUSSION

In the Pediatric Emergency Department of a university hospital, out of a total of 32,059 admissions, there were 636 forensic cases, accounting for 1.9% of the total. In the Adult Emergency Department, out of 95,183 admissions, there were 830 forensic cases, making up 0.87% of the total. Among all the forensic cases, 35.8% (n: 525) occurred in the 0-14 age group and 64.7% (n: 949) involved males. The distribution of forensic cases by season is as follows: 438 in summer (29.9%), 419 in spring (28.6%), 333 (22.7%) in winter, and 276 (18.8%) in autumn. Of the forensic cases, 36.2% (n: 531) arrived at the emergency department on their own, while 33.6% (n: 493) were brought in by ambulance. The most frequent forensic diagnoses were exposure to assault/violence (29.2%), drug poisoning (19.1%), burn (17.1%), falling from a height (14.7%), and firearm /sharp object injury (8.3%). The majority of cases (66.5%) were treated as outpatients and then discharged (Table 1).

Tablo 1. Descriptive characteristics of forensic cases

Characteristics	n	%
Forensic Case Group		
Child	636	43.3
Adult	830	56.7
Age group		
0-14 years	525	35,8
15-24 years	334	22,8
25-34 years	198	13,5
35-44 years	144	9,8
45-54 years	104	7,1
55-64 years	89	6,1
65 years and over	72	4.9
Gender		
Female	517	35.3
Male	949	64.7
Forensic Diagnosis		
Suicide	26	1.8
Drug poisoning	280	19,1
Burn	251	17,1
Assault	428	29,2
Falling from height	216	14,7
Firearm/Sharpobject injury	122	8,3
Alcohol/Substance use	46	3,1
Psychiatric disorder	36	2,5
Traffic accident	11	0.8
Electric shock	14	1.0
Sexual abuse	2	0.1
Foreign body aspiration	6	0.4
Animal bite	11	0.8
Ex	16	1.1
Drowning in water	1	0.1
Admission season		
Spring	419	28,6
Summer	438	29,9
Autumn	276	18,8
Winter	333	22,7
Type of admission		
Own	531	36,2
Ambulance	493	33,6
With relatives	424	28,9
Not specified	18	1.2
Treatment Status		
Discharged	975	66.5
Hospitalization	491	33.5

%: Percent

The distribution of admissions of forensic cases to the emergency services according to age groups is as follows; in the 0-14 age group %35.8 (n:188) burn, %19 (n:100) drug poisoning; in the 15-24 age group %35.9 (n:120) exposure to assault/violence, %21.8 (n: 73) drug poisoning; in the 25-34 age group %46.4 (n:92) exposure to assault/violence, % 21.2 (n:42) drug poisoning; in the 35-44 age group %44.4'ü (n: 64) exposure to assault/violence, %18 (n:26) drug poisoning; in the 45-54 age group %32.6 (n: 34) exposure to assault/violence, %21.1(n:22) firearm/sharp object injury; in the 55-64 age group %37'si (n: 33) falling from a height, %20.2'si (n:18) drug poisoning; and in the 65 + age group %38.8 (n: 28) falling from a height, %20.8'i (n:15) exposure to assault/violence (Figure 1).

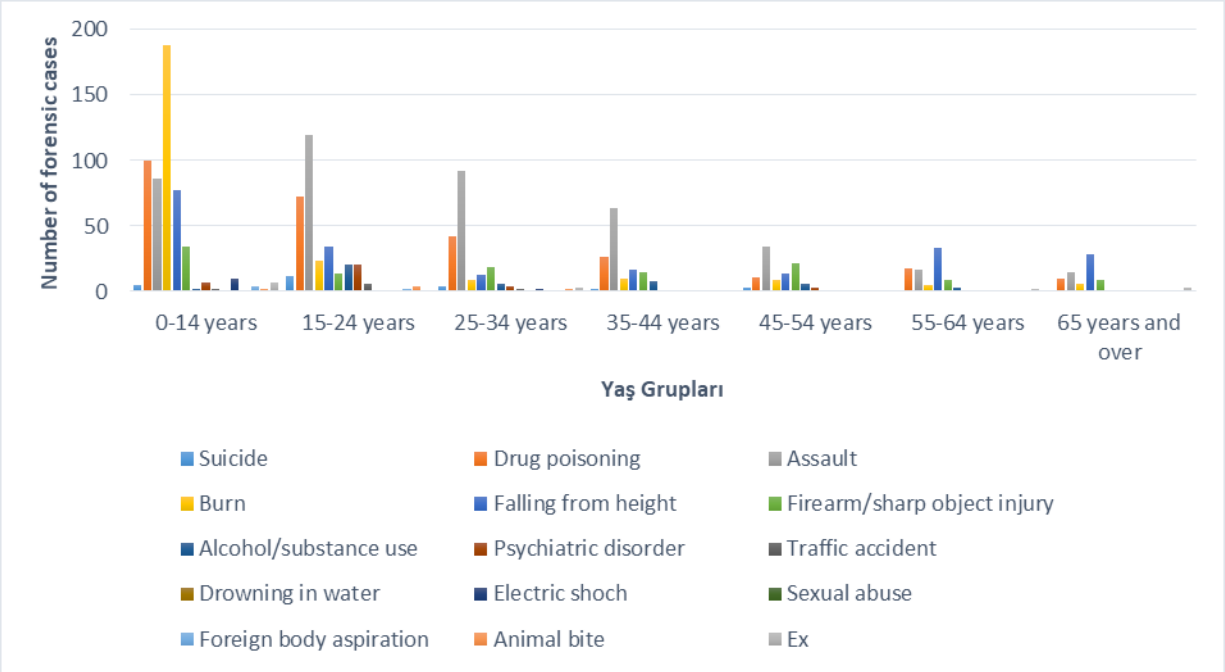

Figure 1. Forensic Case Type by Age

The distribution of forensic case types according to gender is as follows: female/ 29.4% (n:152) due to drug poisoning, 20.3% (n:105) due to exposure to assault/violence, 18.9% (n:98) due to burns, 14.7% (n:76) due to falling from a height; male - 34% (n:323) exposure to assault/violence, 16.1% (n:153) burns, 14.7% (n:140) falling from a height, 13.4% (n:128) drug poisoning, 10.4% (n:99) firearm /sharp object injury (Figure 2).

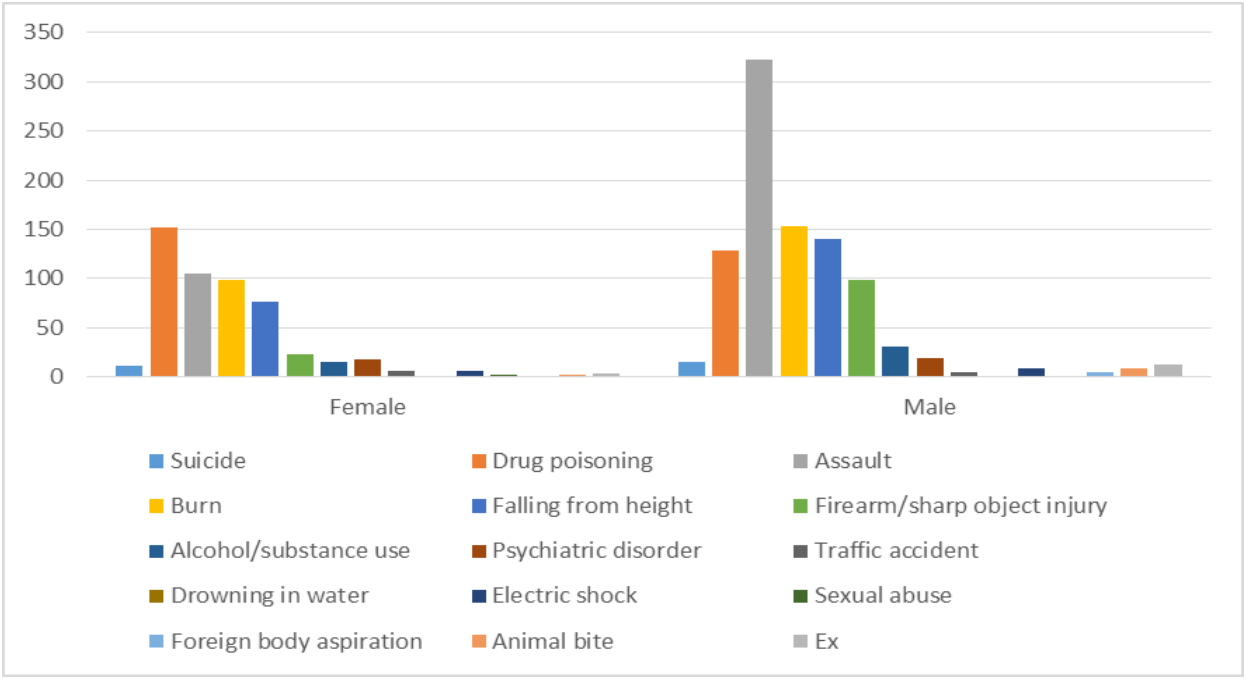

Figure 2. Forensic Case Type by Gender

In this study, the researcher analyzed the characteristics of cases admitted to the adult and pediatric emergency departments of a university hospital between March 2022 and March 2023, specifically focusing on cases evaluated as forensic cases. Forensic cases are commonly encountered in emergency departments and involve legal responsibilities. Among these cases, the researchers found that exposure to assault/violence, burns, and drug poisoning were frequently encountered.[1,3,12]

According to data from the Turkish Statistical Institute in 2021, forensic cases such as external injuries and poisoning resulted in a significant number of deaths among children.[13] In previous studies,[2,14,15] the prevalence of pediatric forensic cases among all forensic cases varied between 18% and 54.6%. Additionally, a considerable proportion, around 80%, of childhood deaths are attributed to emergency medical problems.[2] In this current study, it was found that 35.8% of all forensic cases fell within the age range of 0-14 years, which is consistent with the relevant literature.

Regarding the gender distribution of forensic cases, the study revealed that 64.7% of the cases were male, which is consistent with previous research and can be attributed to the higher male population in society and their increased vulnerability to accidents due to engagement in occupations associated with higher accident risks.

Studies have demonstrated an increase in forensic cases related to trauma among adults during the summer months, attributed to increased physical activity.[3] Similarly, in this study, a higher number of forensic cases was observed during the summer season, which corresponds to a holiday period. This can be attributed to individuals spending more time outside their homes due to the warm weather.

Evidence shows that violent injuries are the leading cause of mortality and morbidity in the young population, and emergency department visits related to such injuries carry a risk of recurrence and are often associated with substance use and mental disorders.[1,16] In this current study, the most common diagnosis recorded for forensic cases was exposure to assault/violence, predominantly observed among males in the age range of 15-54 years, which represents the young population. These findings are consistent with the studies by Aktaş et al. (2018),[6] Arslan and Demir (2022),[7] Demir et al. (2013),[8] Durmaz and Çevik (2016), and Taplak et al. (2020),[9] reporting that injuries caused by assault and violence were frequently seen as forensic cases among males. Globally, violence is the primary cause of death in the 15-44 age group. Evaluating violence data, the World Health Organization's "Violence and Health Report", based on United Nations research in 2002, revealed that approximately 1.6 million people (around 4,400 people per day) died as a result of violence worldwide in the year 2000.[17] Violence is a complex issue influenced by multiple interconnected factors, and no single determinant can fully explain its occurrence or prevalence in societies. It arises from a combination of factors related to individuals, relationships, society, culture, and the environment. In the context of this study, the high prevalence of exposure to assault/violence as a forensic case may be attributed to cultural norms that validate violence as a means to solve problems in the region, norms that establish male dominance over women and children, and the widespread use of firearms.

Falls are commonly observed among elderly individuals admitted to emergency departments.[4] The elderly population is more susceptible to accidents due to balance and coordination problems and diminished sensory functions.[18] In this study, it was found that 38.8% of individuals over 65 years of age visited the emergency department due to falling from a height. Gündüz and Koçaşlı (2017)[4] reported a 16.4% incidence of fall cases among patients aged 71 years and older in their one-year follow-up study conducted in the emergency department. The frequent occurrence of falls from height among elderly individuals can be due to biological, physiological, and psychological changes associated with aging, and decreased adaptability to life and the

environment. Additionally, considering that the study was conducted in a rural area, the prevalence of falling from a height may be influenced by the specific characteristics of the local population. Furthermore, healthcare professionals should be mindful of neglect and abuse when dealing with elderly individuals, considering their limited ability to express themselves and the protective statements they make about their relatives.

Currently, drugs are widely used and easily accessible, making them the most common agents responsible for poisoning. In fact, drug poisoning ranks among the leading causes of admissions to emergency departments.[19] Studies have shown that poisoning cases account for approximately 0.5-7% of all emergency department admissions.[20-22] In our own study, 29.4% of patients admitted for drug poisoning were women, which may be due to the higher prevalence of psychiatric disorders and deliberate self-harm attempts among young women and social and restrictive factors.

In our research, burns emerged as the third most prevalent forensic case, with a higher incidence observed among children aged 0-14 years. This finding is consistent with the study conducted by Yılmaz and Küçükalemdar (2021),[10] which also highlighted the frequent occurrence of burn cases among children. Similarly, Büken and Yaşar (2015)[23] reported that burns are the primary reason for admission to the emergency department, particularly among pediatric patients. According to data from the European Centre for Disease Prevention and Control,[24] burns are more commonly observed in children under the age of 4. Additionally, it has been noted that burn cases are frequent in our country, especially among children aged 0-6.[25] Given that children often spend a significant amount of time at home, it is crucial to raise parental awareness regarding preventive measures within the household and proper first aid interventions in the event of a burn.

Limitations of the Study

It is important to acknowledge the limitations of our retrospective study. Collecting data proved challenging, as is the case with most similar file-based analyses. In an emergency department with an annual admission rate of over 125,000 patients, we encountered difficulties related to registration procedures when accessing the data. Furthermore, since the study was conducted at a single center, the generalizability of the findings is limited.

CONCLUSION AND RECOMMENDATIONS

The psychological, sociocultural, and economic consequences of forensic cases have a significant impact on individuals, families, and society. It is crucial for each region in Turkey to determine its unique characteristics regarding forensic cases to ensure a prompt and accurate approach to patient care. In this study conducted at a university hospital in the northeastern region of Turkey, we analyzed the forensic case records of accident victims admitted to the emergency department and created a profile based on our findings. The most reported forensic cases were exposure to assault/violence, drug poisoning, and burns. It was evident that most of the forensic cases admitted to the emergency department were preventable. To reduce the number of preventable cases, it is essential to implement protective measures in both outdoor and indoor environments and create safe surroundings. Social institutions should support and promote educational and awareness-raising activities that actively involve families, while public service announcements can play a role in raising societal awareness on this issue. The treatment and care of forensic cases require a multidisciplinary approach. Healthcare professionals should approach forensic cases within a team-based framework, providing comprehensive treatment and care while adhering to relevant legal processes. It is recommended to incorporate topics such as identification of forensic cases, evidence collection and preservation, forensic case

reporting, and psychosocial approaches to forensic cases into the in-service training programs for emergency service personnel. Furthermore, establishing and expanding forensic medicine and forensic nursing units within healthcare institutions and organizations and integrating forensic issues into the curricula of medical and nursing undergraduate and graduate education are highly recommended.

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