



Original Article

Evaluation of cases applying to forensic medicine polyclinic due to firearm injuries: Ordu example

Hacer Yasar Teke¹, Abdullah Imat², Hanim Gokce Arslan³

¹Ordu University, Faculty of Medicine, Department of Forensic Medicine, Ordu, Türkiye

²Forensic Council of Ordu, Ordu, Türkiye

³Hatay Mustafa Kemal University, Faculty of Medicine, Department of Forensic Medicine, Hatay, Türkiye

Received February 06, 2024; Accepted April 16, 2024; Available online April 30, 2024

Content of this journal is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.



Abstract

Aim: This study aims to understand the key characteristics of firearm injury cases in light of the current literature, which are on the rise with an increase in individual armament across the globe in recent years.

Materials and Methods: In this study, cases of people with firearm injuries—who had applied to the Forensic Medicine Polyclinic of Ordu Training and Research Hospital between 2017 and 2022—were retrospectively examined in terms of their sociodemographic and wound characteristics, as mentioned in their records.

Results: Of all the cases recorded in the period mentioned above, 0.86% had applied to the Forensic Medicine Polyclinic due to gunshot wounds, with 93.9% cases involving men and 6.1% involving women. Approximately one-third of these cases had bone fractures, and the average hospitalization period was six days.

Conclusion: Although the rates of firearm injuries in women and children are low, raising awareness in terms of the great cost it bears for society, along with a decrease in individual productivity, remains crucial.

Keywords: Gunshot, forensic medicine, wound

INTRODUCTION

The increase in individual armament has been noteworthy in recent years, not only globally but also in Türkiye. The 2017 data from the United Nations Office on Drugs and Crime mentions the use of firearms in 54% of homicides worldwide [1]. In the United States, in 2020, 79% of all homicides and 53% of all suicides were committed with firearms, and this rate increased by 35% from 2019 to 2020 [2].

Despite prohibitions in carrying and using firearms without a permit posed by firearm control laws in Türkiye, the widespread illegal acquisition of guns remains noteworthy [3]. According to 2021 data from the Turkish Statistical Institution, 26.3% of suicides were committed with firearms [4]. Even 7.3% of trauma cases admitted to the university emergency department

in Gaziantep every four years have been reported to be related to firearm injuries [5].

This study aims to contribute to the literature by reviewing the sociodemographic characteristics, severity, frequency, etc. related to gunshot injuries in cases exposed to firearm injuries.

MATERIAL AND METHOD

This study was approved by the Ordu University Clinical Research Ethics Committee on May 12, 2023, with decision number 141. In this study, the cases of people with firearm injuries—who had applied to the Forensic Medicine Polyclinic of Ordu Training and Research Hospital between 2017 and 2022—were retrospectively examined. The sociodemographic characteristics of the cases—such as the injured area, the year of the incident, the number

CITATION

Yasar Teke H, Imat A, Arslan HG. Evaluation of cases applying to forensic medicine polyclinic due to firearm injuries: Ordu example. NOFOR. 2024;3:10-3. DOI: 10.5455/NOFOR.2024.02.01



Corresponding Author: Hacer Yasar Teke, Ordu University, Faculty of Medicine, Department of Forensic Medicine, Ordu, Türkiye
Email: hacer.hgulderen2004@gmail.com

of wounds, the severity of the wound(s), and whether the case underwent surgery—were investigated. Descriptive statistics were given as percentages and mean±standard deviation. The chi-square test was performed on a slope. Statistical significance was $p<0.05$.

RESULTS

Between 2017 and 2022, 3825 final reports were prepared in our polyclinic, with 0.86% (n=33) of the cases related to firearm injuries. When examined in terms of years, the ratio of the total number of final reports to that of firearm injury cases was found to be highest in 2017 at 1.87% and lowest in 2021 at 0.42%. It was determined that 54.54% (n:18) of the cases were from the city center; the other cases were from the districts, with no cases reported from outside the city.

Of the cases, 93.9% (n=31) were men, and 6.1% (n=2) were women. The youngest case was that of a 9-year-old, the oldest case was that of a 65-year-old, and the average age was 33.88 ± 14.21 . According to the records, 100% of cases of women (n=2) and 90.3% cases of men (n=28) were found to be those of “nonaccidental injury.” Two cases, both belonging to the male gender, were in the childhood age group of 9 and 11 years old.

According to the slope chi-square test, the number of shots was found to be lower in short-barreled weapons and higher in long-barreled weapons ($p<0.05$; $\chi^2=14.128$). The most injured body part was in the lower extremities, that is, 54% (n=16), followed

by 23% (n=7) in the upper extremities, with 10% (n=3) in the abdomen, 10% (n=3) in the chest, and 3% (n=3) in the neck area.

Of all the cases, 37.3% (n=9) had bone fractures, 15.2% (n=5) had a single bone fracture, and 12.1% (n=4) had multiple bone fractures. The distribution of broken bones is shown in Table 1.

Table 1. Percentage distribution of broken bones

Broken bone	n	%
Metatarsal	5	31.25
Rib	3	18.75
Tibia	3	18.75
Fibula	2	12.50
Phalanx	2	12.50
Scapula	1	6.25
Total	16	100

Of all the cases, 33.3% (n=11) underwent surgery, from which the shortest hospitalization period was 1 day, while the longest was 22 days, with an average hospitalization period of 6 days. The characteristics of the hospitalized cases are detailed in Table 2. The medical treatment cost invoices were obtained for 14 patients, and when the average medical treatment cost was calculated, it was found to be 1943 Turkish Liras (TL).

Table 2. Characteristics of hospitalized cases

Gender	Age	Operation type	Hospitalization period (Day)
Male	42	Liver and intestinal repair	2 days
Male	42	Tibia fixation, popliteal artery repair	3 days
Male	41	Flap application to the left arm	1 day
Male	55	Phalanx fixation	2 days
Male	30	Femur fixation, femoral artery repair, fasciotomy, embolectomy	22 days
Male	24	Knee diagnostic arthroscopy, debridement	5 days
Male	44	Femoral artery repair	4 days
Male	41	Liver, kidney repair	8 days
Male	23	Liver, stomach repair	12 days
Male	22	Tendon repair, bone graft	5 days
Male	24	Removal of a deep foreign body	1 day

The summer season had the highest rate (31%) of firearm injuries. Upon examination of the report results, only 8 cases (24.24%) were considered to have life-threatening injuries.

DISCUSSION

Although most firearm injuries often lead to fatal consequences, nonlethal injuries are also observed. The socioeconomic structure of society, gun culture, degree of accessibility to firearms, and

many other factors can contribute to regional differences in the incidence of firearm injuries. According to a report prepared by the Umut Foundation in 2022, the Black Sea region ranks fourth, with 543 incidents of armed violence. According to the same report, a 3.63% increase in violent occurrences was observed in the Mediterranean region in a year, ranking third. In addition, Ordu province has reported 18 fatalities and 45 injuries due to armed conflicts [6].

In the literature, among all forensic cases received in the emergency department, the proportion of firearm injuries has been reported to range from 0.68% to 4.7% [7,8]. The rate of firearm injuries applied to a hospital in Mersin Province has been reported to be 3.2% in one year [9]. This study found that of all the cases, 0.86% involved a firearm injury in Diyarbakır, 15.7% [10] in Adıyaman, 11.05% [11], and in Eskişehir, 0.69% [12]. Proportional differences may arise in studies conducted in different geographical regions and sociocultural societies.

A study carried out in Elazığ's emergency department revealed that of the 55 individuals with firearm-related abdominal injuries, 92.7% were men [13]. Of the 142 patients in another trial conducted in the emergency department, 91% were men [14]. According to a study conducted in Adana, of the 1046 cases of women who presented at the forensic medicine clinic while suffering from firearm injuries, 12 were over the age of 18 [15]. The literature suggests a higher rate of firearm injuries among men, which is supported by the results of this study. The reason for this situation may be the active participation of men in social life as well as incidents involving armed violence.

The average age of those examined in this study was 33.88 ± 14.21 , whereas the average age in a study conducted in the emergency department in the Şırnak region [16] was reported as 27.31 ± 11.02 . Studies indicate that, despite the limited information in Türkiye about mortality rates, sequelae, etc., child mortality rates from firearm injuries have increased, especially in recent years [17,18]. Only 2 of the 262 children who underwent five years of follow-up care in the pediatric surgery service in Konya due to trauma were reported to have had gunshot injuries [19]. The number of pediatric cases in this investigation was similar to that reported in the literature. While the increase in acts of armed violence especially affects young adults who participate in social life, it also affects individuals who may be in that environment, such as women, the elderly, children, and the disabled, who need social support. Hence, comparing the increase in acts of armed violence and the sociodemographic characteristics of people exposed to violence in these incidents will contribute to the literature.

In this type of injury, the most common injury areas are the lower extremities and the abdominal region [20]. A review of research carried out in the emergency department in Ankara, 24 out of 142 cases of gun-related injuries died despite treatment. According to the same study, the most commonly injured area (48%) was the lower extremities [14]. This study had similar results in that the most common injury area (54%) was the lower extremity region.

According to the findings of the Elazığ's sample, 37 cases (67.3%) were injured with long-barreled weapons and 16 cases (21.7%) with short-barreled weapons [13]. A study carried out in an emergency department in England revealed that 12 patients had multiple injuries, while 32 patients had a single injury [21]. In this study, 21 cases had a single wound, and 12 cases had multiple wounds. In addition, the low number of shots and wounds with short-barreled weapons were found to be statistically significant.

Due to the ammunition structure, the number of wounds in short-barreled weapons may be lower than in long-barreled weapons. In long-barreled weapons, as the shooting distance increases, the change in the number of wounds depends on the distribution of the pellets.

Based on the final reports of research conducted at a military hospital in Ankara, 12.5% of the cases had firearm injuries, and around half of those cases were considered life threatening. This rate was 24.2% in this study; variations in the assailant and patient profiles were assumed to be the cause of the observed variation in the rate.

It is commonly known that injuries caused by firearms require expensive medical care. According to an American study, the yearly cost of lost productivity as a result of firearm-related injuries is projected to be over 35 billion dollars [22]. For this study, we were able to access the treatment cost invoices issued to the Social Security Institution for only 14 cases out of 33 cases, the reports of which are given, and for informative purposes, we stated that this value was 1943 TL. This value includes only the costs related to emergency services and minor surgical operations during the incident and not other financial losses, such as the costs of working days when the person is on sick leave and cannot work, rehabilitation expenses, and forensic medicine report fees.

CONCLUSION

In conclusion, this study highlights the sociodemographic and injury characteristics of cases admitted to the forensic medicine polyclinic in Ordu due to firearm injuries. The study reveals that firearm injuries are more prevalent among males and predominantly affect the lower extremities. Considering the significant societal costs and the negative impact on individual productivity caused by firearm injuries, it is crucial to emphasize the importance of awareness campaigns and regulatory measures. In this regard, reducing firearm injuries requires preventing the use of unlicensed weapons, reviewing the criteria for purchasing licensed weapons, and raising social awareness. Creating consciousness across all segments of society and implementing educational programs will play a key role in mitigating such injuries. To reduce the rate of injuries caused by firearms, preventing the use of unlicensed weapons, reviewing the criteria for purchasing licensed weapons, and raising social awareness are required.

The limitation of this study is that only hospital records, personal statements, and data were assessed retrospectively. Crime scene information, characteristics of the perpetrators, and the nature of the incident could not be evaluated in detail since investigation files could not be obtained. Another limitation of this study is that the long-term effects of trauma on individuals surviving firearm injuries are not discussed.

This study was presented as an oral presentation at the IV. International Turaz Academy Congress held in Antalya Belek during October 26–29, 2023.

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

This study was approved by the Ordu University Clinical Research Ethics Committee on May 12, 2023, with decision number 141.

References

1. NODC, Global Study on Homicide 2019 (Vienna, 2019). <https://www.unodc.org/documents/data-and-analysis/gsh/Booklet1.pdf> access date 17.04.2023
2. Kegler SR, Simon TR, Zwald ML, et al. Vital signs: changes in firearm homicide and suicide rates - United States, 2019-2020. *MMWR Morb Mortal Wkly Rep.* 2022;13;71:656-63.
3. Azmak D, Altun G, Bilgi S, Yılmaz A. Firearm fatalities in Edirne, 1984-1997. *Forensic Sci Int.* 1998;95:231-9.
4. TÜİK. tuik.gov.tr access date 17.04.2023
5. Çiftçi A, Durak VA, Aslan Ş. The evaluation of the factors affecting mortality in trauma patients admitted to the emergency department. *Anatolian J Emerg Med* 2020;3;76-80.
6. Umut Vakfı – Türkiye silahlı şiddet haritası. <https://umut.org.tr/umut-vakfi-turkiye-silahlı-siddet-haritasi-2022/> access date 17.04.2023
7. Korkmaz T, Kahramansoy N, Erkol Z, Sarıçıl F, Kılıç A. Evaluation of the forensic patients presenting to the emergency department and legal reports. *Medical Bulletin of Haseki.* 2012;50:14-20.
8. Güven KFM, Bütün C, Beyaztaş YF, Eren ŞH, Korkmaz İ. Evaluation of forensic cases admitted to Cumhuriyet University Hospital. *ADÜ Tıp Fakültesi Dergisi.* 2009;10:23-8.
9. Yapıcı G, Bilgin GN. Evaluation of forensic cases due to injury admitted to Mersin University Hospital in 2010. *TAF Prev Med Bull.* 2014;13:459-64.
10. Tıraşçı Y, Durmaz U, Altınal A, et al. A retrospective evaluation of judicial reports issued by forensic medicine department of Dicle University. *Dicle Medical Journal.* 2016;43:424-30.
11. Şehlikoğlu K, Aslan MC. Evaluation of the forensic traumatology related reports documented at the Council of Forensic Medicine, Adiyaman Branch Office. *Turkish Journal Of Forensic Medicine.* 2022;36:109-18.
12. Çelik Y, Kılıboz T, Doğan B, et al. Evaluation of forensic reports in terms of life-threatening criteria. *Osmangazi Tıp Dergisi.* 2021;43:308-17.
13. Çetinkaya Z, İlhan SY, Bülbüller N, et al. Abdominal firearm injuries. *Ulus Travma Acil Cerrahi Derg.* 1998;4:206-10.
14. Karaca MA, Kartal ND, Erbil B, et al. Evaluation of gunshot wounds in the emergency department. *Ulus Travma Acil Cerrahi Derg.* 2015;21:248-55.
15. Yavuz Koca T, Kaya K, Hilal A. Evaluation of the physical and sexual violence cases against women applied to the department of forensic medicine of Çukurova University Medical Department in 2019. *Journal of Harran University Medical Faculty.* 2021;18:284-9.
16. Saylam N, Uyanık B, Buz M, et al. Gunshot injuries due to Terror. *Anatolian Journal of Emergency Medicine.* 2019;2;18-23.
17. Vatanserver G, Yılmaz H, Nalbant T, et al. Clinical characteristics of firearm-related injuries in children in Turkey. *The Turkish Journal of Pediatrics.* 2022;64:971-84.
18. Dündar AS, Altın İ. Cases under the age of 18 who are determined to have died due to firearm injury at Şanlıurfa Forensic Medicine Branch directorate examination. *Phnx Med J.* 2023;5:206-10.
19. Kart Y, Bilaloğlu E, Duman L, et al. Assesment of patients followed up in pediatric surgery service due to trauma: a retrospective 5 year study. *Med J SDU.* 2021;28:537-41.
20. Eriş S, Orak M, Al B, et al. Factors affecting mortality in patients with gunshot injuries. *Marmara Medical Journal.* 2009;22:181-91.
21. Davies M, Kerins M, Glucksman E. Inner-city gunshot wounds – 10 years on. *Injury.* 2011;42:488-91.
22. Corso P, Finkelstein E, Miller T, et al. Incidence and lifetime costs of injuries in the United States. *Injury Prevention.* 2015;21:434-40.