Original Article

Medico-legal profile among the victims of firearm injury cases at SMS Hospital, Jaipur

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Abstract

Background: Injury from a firearm (FA) is a major public health concern that presents significant economic and medical challenges. Death rates from firearm injuries have dramatically increased as a result of easy access to firearms and political and social unrest.

Aims & objective: Assessment of medico–legal profile among the victims of firearm injury cases at SMS Hospital, Jaipur.

Material & methodology: A prospective cross-sectional descriptive study with inclusion and exclusion criteria was carried out. The study included 80 cases of gun injury. From June 2021 to August 2022, the SMS Medical College and Attached Group of Hospitals, Jaipur, conducted the current study on cases of firearm-related injuries that were either treated or autopsied.

Result & observation: The majority of the subjects in the current study 75 (93.75%) were the victims of attempted murder. Nearly half 39 (48.75%) of all firearm shots were made from a distance. In the current study, tattooing affected 25 subjects, blackening affected 24 subjects, and singeing affected 16 subjects overall.

Conclusion: empty mind devil's house it is a famous old proverb that's why we must encourage young people and adults to work for a living. The reduction of firearm injuries may be facilitated by the growth of a stable social environment, political stability, and strict regulation of the production, sale, and renewal of licences for weapons. periodic inspection of manufacturing units and manufactured weapons will reduce accidental firearm injuries.

Key word: Blackening, Firearm, Singeing, Tattooing.

Introduction

A firearm is any instrument or device designed to propel a projectile through an explosion of gases generated by the combustion of an explosive substance[12]. Firearm (FA) injuries pose a great health burden and present enormous challenges

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for health and national economics[4]. The use of unlicensed firearms has increased in the last few years. In Rajasthan, illegal firearms were used to kill the majority of gun murder victims in 2021. Locally made illegal firearms are commonly used in criminal cases in developing countries[2]. Gunshot injuries are potentially devastating to tissues, depending on the caliber of the weapon. Large-scale tissue necrosis and extensive soft tissue damage are caused by high-velocity rifle and shotgun rounds. On the other hand, low-velocity pistol or handgun injuries are usually devoid of temporary cavitation effects and severe soft tissue devitalization[15]. As a result of the invention of more advanced firearms and availability at the global level, death rates due to firearm injuries have increased dramatically[3]. Monitoring and analyzing the medico-legal profile of gun injury victims can help identify emerging trends and develop plans to combat them.

Aim & objectives

The purpose of the study was to assess the medico-legal profile of gun injury victims and to provide a picture of the situation.

Materials and Method

The cross-sectional descriptive observational study included all medico-legal firearm injury cases that were autopsied or admitted at SMS Medical College and Attached Group of Hospitals, Jaipur, and who provided written informed consent for participation in the study. I disregarded air gun injuries, explosion/blast injuries, and cases involving fabricated firearm wounds in the preliminary medico-legal examination. The current study included 80 cases. The sample size had calculated with a 95% confidence level and a 10% absolute error.

Observations & Results

During the study period, 39273 medico-legal cases were examined in SMS Medical College and Attached Group of Hospitals, Jaipur, out of which 80 cases were of firearms. Thus, the load of firearm injuries during the study period was 0.23% of all examined. All details were recorded and analyzed.

93.75 percent (75) of the subjects in the current study were the victims of attempted murder. In 11.25% of the cases, the shooting was deemed homicidal. Only 5% of subjects were involved in an accidental gunshot, and all received successful hospital treatment. Only one suicidal firearm injury case was presented during the study period.

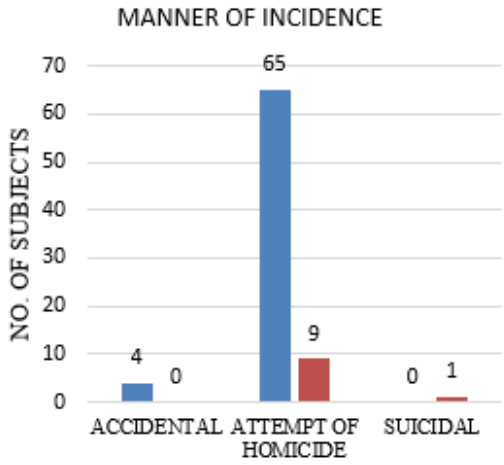

Figure 1: Distribution of subjects according to manner of incidence

A rifled firearm was used in 42 of the subject cases, of which 36 involved factory-made firearms and 6 involved unidentified firearms. There were 38 subjects in the current study who used smooth bore firearms; of these, 21 shots came from country-made firearms, 8 from factory-made firearms, and 9 shots had no known firearm weapon origin.

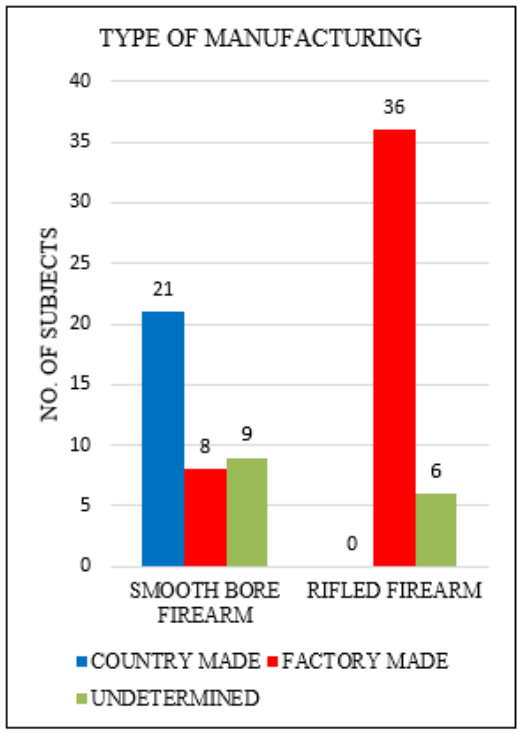

Figure 2: Distribution of subjects according to weapon type and manufacturing

Without seeking confirmation from a ballistic expert, the current study reached its conclusion about the range of a firearm shot based on the characteristics of the firearm wound and the information that was available about the incident.The majority of firearm shots—48.75% cases—were fired from a distance, while the least number—11.25% cases—were fired from near shot range. 20.5% of the subjects had a close-range shot, and 17.5% of the firearm shots' ranges remain unknown; they may be discernible with the help of a ballistics expert. Only 2.50% of the cases involved a contact shot.

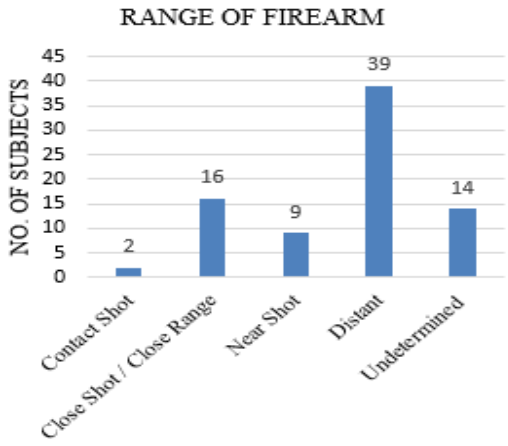

Figure 3: Distribution of subjects according to range of firearm shot

Overall, 16 subjects had been singeing, 24 had been blackening, and 25 had been tattooed. Eleven subjects had a grease collar, 41 had an abrasion collar, and 32 had a contusion collar.

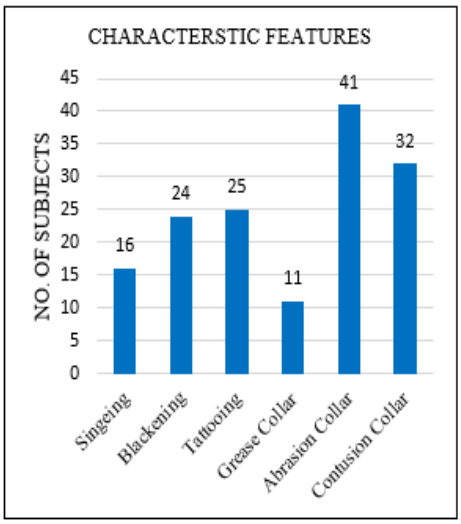

Figure 4: Characteristic feature of entry wound

Our research revealed that 80 subjects had entry wounds, of which 35 had more than one entry wound and 45 had just one. A single exit wound was present in 11 subjects, and none of the subjects had multiple exit wounds.

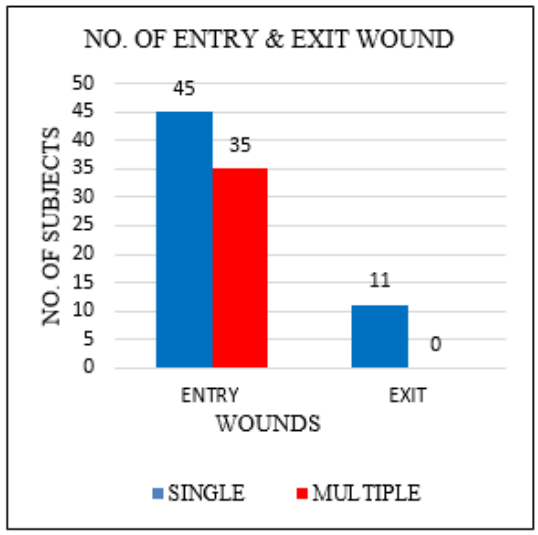

Figure 5 no. of entry and exit wound

With a shock to coma ratio of 4:1, shock was found to be a more frequent cause of death in the current study than coma.

Discussion

Similar to our study, the majority of other studies found that homicidal intent predominated. These studies include Sachan R, et al., Kanpur, (2013)[14] (92%); Chaurasia N, Varanasi, (2014)[1] (85.4%); Patnaik KK, et al., Berhampur, (2014)[8] (96%); Kumari S, et al, Agra, (2014)[5] (88.34%); Pargi S, et al., Jaipur, (2016)[9] (79%); Kaulaskar SV, et al., Varanasi, U.P, (2020)[6] and Uchendu O J, et al., Nigeria, (2019)[16]. Some studies only took into account homicidal gunshot wounds (Patowar AJ, et al., Guwahati, (2005)[10]; Pradipkumar KH, et al., Imphal, (2005)[11]); or suicidal gunshot wounds (Rao D, Bangalore, (2015)[13]). The preponderance of homicide in gun-shot injuries is explainable as these deadly weapons are generally used in planned manner or more so impulsively in a planned assault. Accidental injuries with firearms are also not uncommon as users are prone to such episodes while cleaning, maintenance or erratic handling of loaded guns. Self-inflicted injuries and suicide deaths are reported at extremely low rates because only a small percentage of the general population has legal,

licensed firearms. Accidental injuries were seen in this study in 5 % cases but these results are quite high as compared to 1.73% Patnaik KK, et al., Berhampur, (2014)[8] and found similar to that of 6.67% Kumari S, et al., Agra, (2014)[5] but less as compared to 16.52 % Pargi S, et al., Jaipur, (2016)[9]. Accidental injuries were predominantly seen in 4th and 6th decade ; Whereas, homicidal injuries were represented in all age groups. There was one cases of suicidal deaths due to firearm in 6th decade. Interestingly, suicides was committed by males (100%) as also reported by Patnaik KK, et al., Berhampur, (2014)[8]. None of the females used it as a method of suicide as firearm weapons are mostly out of reach of women.

Rifled firearm weapons (52.5 %) were the most commonly employed firearm weapon to offend the victims in the present study followed by smooth bore firearm weapon (47.5 %) which are similar to the results of study by Pargi S, et al., Jaipur, (2016)[9]; Uchendu O J, et al., Nigeria, (2019)[16] and Kumar R, et al. (2021)[7]. But, our results are not in accordance with those of Kumari S, et al., Agra, (2014)[5]; who reported country made guns (Desi kattas) to be the predominantly used weapons (60%) followed by rifled firearm weapons (36.67%). Fatal episodes were maximally witnessed with use of rifled firearm weapon. 3 gun-shot wound of smooth bore weapon (shotgun) resulted in mortality, as they are the less deadly lot of firearm where only contact and close wounds might result in fatality.

There was presence of entry wounds in all 100% victims. There was a single entry wound in 56.25% of the cases, which is consistent with the findings of Patowary AJ, Guwahati, (2005)[10] and Pargi S, et al., Jaipur, (2016)[9], and it is also consistent, but slightly lower, with the findings of Kumari S, et al., Agra, (2014)[5] (95% with single entry wound), But Sachan R, et al., Kanpur, (2013)[14], another study from U.P., disagreed with us, finding that 68% of cases had multiple entry wounds. In 21 % cases of rifled firearms, multiple fires were attempted.

In 69 cases (86.26 %) there were only entry wounds, no exit wound was found, implying that the metallic foreign body did not leave the body and could be retrieved, it was recovered and forwarded for ballistic examination in 45.71% live cases; quite similar to 42.5% Pargi S, et al., Jaipur, (2016)[9]; 49.5% Sachan R, et al., Kanpur, (2013)[14]. This is explainable as the majority of the gun-shot wounds in this study were distant fires.

In majority of the victims, firearm exit wounds were not present. In our study, a single exit wound was found in 13.74 % cases and no cases with multiple exit wounds. These results are quite comparable to study of Pargi S, et al., Jaipur, (2016)[9]; It is against the findings to those of Kumar R, Varanasi, (2013)[7]; and, Kumari S, et al., Agra, (2014)[5]; who reported presence of exit wounds in 61.36% cases.

Abrasion and contusion collars were the most consistent findings in entry wounds of rifled firearm weapons. The characteristic features of blackening, singeing and tattooing were seen in relatively fewer number of entry wounds, because the majority of gun-shot entry wounds in this study were distant fires. Blackening was seen in 26 cases and tattooing in 27 cases. These findings of the present study are quite comparable to study of Pargi S, et al., Jaipur, (2016)[9]; in contrast with Kumar R, Varanasi, (2013)[7]; and, Kumari S, et al., Agra, (2014)[5] and can be attributed to the variations in the predominantly used firearm weapon and range of fire in both studies.

Coma due to head injury (20%) and haemorrhagic Shock (80%) resulting from gunshot injuries were the cause of death in most fatal cases. These findings were consistent with the study of Patowary AJ, Guwahati, (2005)[10]; Kumari S, et al., Agra, (2014)[5];Sachan R, et al., Kanpur, (2013)[14] and Kumar R, et al,(2021)[7]. On contrary to this Shock and Coma contribute equally (45.4% each) in study of Pargi S, et al., Jaipur, (2016)[9].

Conclusion

The development of a healthy political climate, social stability, and strict control over illegal weapon production, sale, issuing, and renewal of licences may reduce firearm injuries. 93.75% of cases were attempts or achieved homicides, and 1% were suicides; these indicate an agitated mental status of the persons involved in the firearm incidents. A strict mental check-up of the person to whom a firearm licence is issued and a repeated mental check-up at the time of licence renewal will help reduce firearm-related injuries. If possible, mental check-ups and screenings,

if extended to all family members, may reduce firearm injury cases. 5% of cases were accidental in nature; hence, keeping a check with periodic inspections of manufacturing units and manufactured weapons will reduce accidental firearm injuries. On expiration of the licence, submission of the old firearm back to authorities may be made mandatory. A thorough training of customers regarding the storage, operation, and maintenance of firearms will also reduce accidental injuries. Mandatory time-bound servicing at the facility or franchise may also help reduce accidents.

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Ethical approval: From the institutional ethical committee.

Conflict of interest: Nil

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