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RESEARCH PAPER

Profile of firearm deaths brought to JNIMS mortuary, Imphal, Manipur

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ABSTRACT

Background aims*: The present study is aimed at outlining the profile of deaths due to firearm injuries in Manipur and to have an idea about the occurrence of deaths due to firearm injuries.* ***Materials and methods****: Study design is a cross-sectional retrospective study. All the cases of firearm fatalities brought to the Mortuary, Department of Forensic Medicine and Toxicology, JNIMS, Porompat, Imphal, Manipur, from January 2015 to December 2019, a complete 5-year period, were included in the study. Ethical clearance was taken from IEC JNIMS, Imphal.* ***Results****: Out of the total 997 cases brought for autopsy during the period, 100 cases (10.03%) were deaths due to firearm injury. The most frequent age groups were 21-30 and 31-40 years, with 32% and 41%, respectively. Among the victims, 94% were males and 06% were females. In terms of manner of death, 87% of the cases were homicidal, followed by 10% suicidal and 3% accidental. Rifled firearms were used in 95% of the cases, and multiple shots were present in 58% of the cases. Most of the victims were civilians (41%).* ***Conclusion****: In the present study, most of the victims were males of the productive age group with multiple shots, and most of them were homicide deaths, with rifled firearms being used in most of the cases.*

Keywords*: Firearm injury; firearm fatalities; rifled firearm; homicidal; suicidal.*

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INTRODUCTION

The magnitude and prevalence of firearm violence make it an essential public health concern. Every day, many people die due to firearm-related injuries all over the world. Death due to firearm injury can be both intentional and accidental. There are wide variations in firearm-related death rates between the different world regions and between individual countries. Though in

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western countries, suicidal fatal firearm injury is very common, in this region of the world, it is mostly used in homicidal cases.[1] Manipur is a remote, mountainous, small northeastern state of India near the Golden Triangle region. Its international border with Myanmar is 398km long, which is mostly porous and unfenced. It has a history of separatist violence and various illicit activities, including drugs and firearm trafficking. The offensive and defensive use of firearms can take many specific forms depending on the context of their use. Firearms can also be used by criminals in cases of extreme brutality to send a message, not only to direct criminal opponents but also to catch the attention of the public as well as state authorities. Moreover, drug markets across the globe also create demands for firearms since firearms are a tool for drug criminals to use for offensive, defensive, and reputational purposes.[2] Gun-related violence occurs all around the world, including in countries in which guns are illegal.[3]

However, violence by firearms is prevalent all over the world in some form or another; it is still preventable if the trend and risk factors associated with firearm injuries are amended promptly, documented and addressed strictly. Thus, it can help reduce the burden of firearm-related death in society.

MATERIALS AND METHODS

The present study was a cross-sectional retrospective study in the Department of Forensic Medicine and Toxicology, JNIMS, Imphal, Manipur. All the cases of firearm fatalities brought to the mortuary of the Department of Forensic Medicine and Toxicology, JNIMS, Porompat, Imphal, Manipur, from January 2015 to December 2019, a complete 5-year period, were included in the study. They were analysed statistically, categorising them into various parameters in the form of various tables, charts and bars.

Inclusion criteria: All firearm death cases brought to the mortuary during the abovementioned period. Exclusion criteria: Unidentified bodies.

RESULTS

Out of the total 997 cases brought for autopsy during the study period, 100 cases (10.03%) were deaths due to firearm injury. Most of the victims, 94% of the cases (n=94), were males, and only 6 cases (06%) were females. The commonest age group was 21-40 years, with 73 cases altogether (73%), as shown in **Table 1**.

Table 1 Age and sex-wise distribution of cases

Age in years	Number of males	Number of females	Total number
0-10	0	0	0
11-20	6	1	7
21-30	32	0	32
31-40	40	1	41
41-50	10	1	11
51-60	5	3	8
61-70	1	0	1
Above 70	0	0	0
Total	**94**	**6**	**100**

Most cases occur in the summer, with 35% of the cases. Coming to the manner of death, most of the cases were homicidal (87%), followed by 10% suicidal, and 3% of the cases were accidental deaths. Rifled firearms outnumbered shotguns by 95% and 5%, respectively, as shown in **Table 2**. Among the 87 homicidal cases, 83 (95.4%) used rifled firearms, whereas, among the 10 suicidal cases, 9 (90 %) used rifled firearms.

Table 2 Type of firearm in relation to manner of death

Type of firearm	Homicidal	Suicidal	Accidental	Total
Rifled	83	9	3	95
Smooth bore	4	1	0	5
Total	**87**	**10**	**3**	**100**

As far as the number of shots is concerned, multiple entrance wounds were present in 58 cases (58%), and in 42% of the cases (n=42), a single entrance wound was present. Out of the total 87 homicidal cases, 56 (64.37%) had multiple entrance wounds, and 31 cases (35.63%) had single entrance wounds. On the other hand, among the 10 suicidal cases, 8 (80%) had single entrance wounds, and only 2 cases (20%) had multiple entrance wounds. But, in the accidental cases, all the 3 cases had a single entrance wound, as shown in **Table 3**.

Table 3 Number of entrance wounds in relation to manner of death.

Number of shots	Homicidal	Suicidal	Accidental	Total
Single	31	8	3	42
Multiple	56	2	0	58
Total	**87**	**10**	**3**	**100**

Considering the range of firing, most of the cases (84%) were shot from a distant range, with a total of 84 cases out of the 100 cases, whereas 8% of the cases (n=8) were shot from close/near range, followed by 8% of the cases (n=8) of contact shots. Among the 87 homicidal cases, 82 (94.3%) were shot from a distant range, and only 5 cases (5.7%) were shot from close or near range. There was no contact range shot in the homicidal cases. On the other hand, in the suicidal cases, 80 % (n=8 out of 10 cases) were contact shots, and 20 % (n=2) were close or near shots. There was no case of a distant-range shot. Accidental deaths were either distant-range shots or close/near-range shots, with 2 cases (66.7%) and 1 case (33.3%), respectively. There was no case of a contact shot in accidental cases, too, as in the case of homicides, which are shown in **Table 4**.

Table 4 Range of fire in relation to manner of death

Range	Homicidal	Suicidal	Accidental	Total
Contact	0	8	0	8
Close or near	5	2	1	8
Distant	82	0	2	84
Total	**87**	**10**	**3**	**100**

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The most common victims in the present study were civilians (41%), with a total of 41 cases, followed by law enforcement agents and militants, with 32% and 27%, respectively. The commonest assailants were militants, with 47% (n=47), followed by law enforcement agents, with 17 cases (17%). In 24% of the cases, the assailants were not known. In a particular case, the assailant happened to be the brother of the victim himself (civilian), and the incident occurred following a domestic quarrel between the two brothers, as highlighted in **Table 5**.

Table 5 Type of victim and assailant

Type of victim	Number	Type of assailant	Number
Civilian	41	Civilian	1
Law Enforcing Agent	32	Law Enforcing Agent	17
Militant	27	Militant	47
Total	100	Self	11
		Unknown	24
		Total	**100**

The maximum number of incidents in the present study occurred in Chandel district, with 23 cases, followed by Noney and Senapati districts, with 21 and 19 cases, respectively, as shown in **Figure 1**. All the places are remote areas.

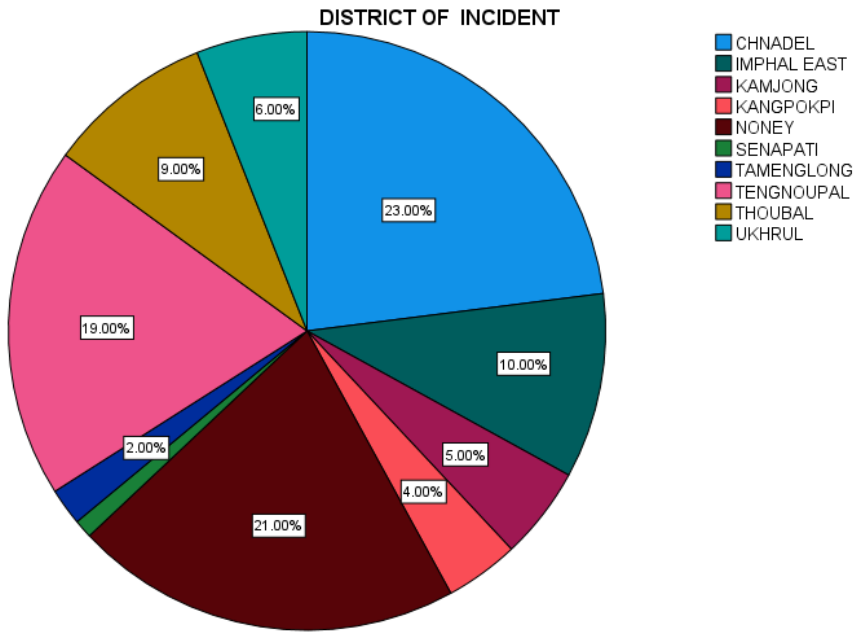

Figure 1 District of incident

Regarding the distribution of entrance wounds in relation to body parts, entrance wounds were present in multiple parts of the body in 50% of the cases, while 24% of the cases had entrance wounds on the head and neck. This is followed by 15% of the cases on the chest and 6% on the abdomen. The lowest number of entrance wounds was found on the limbs, with only 5% of the cases shown in **Figure 2**.

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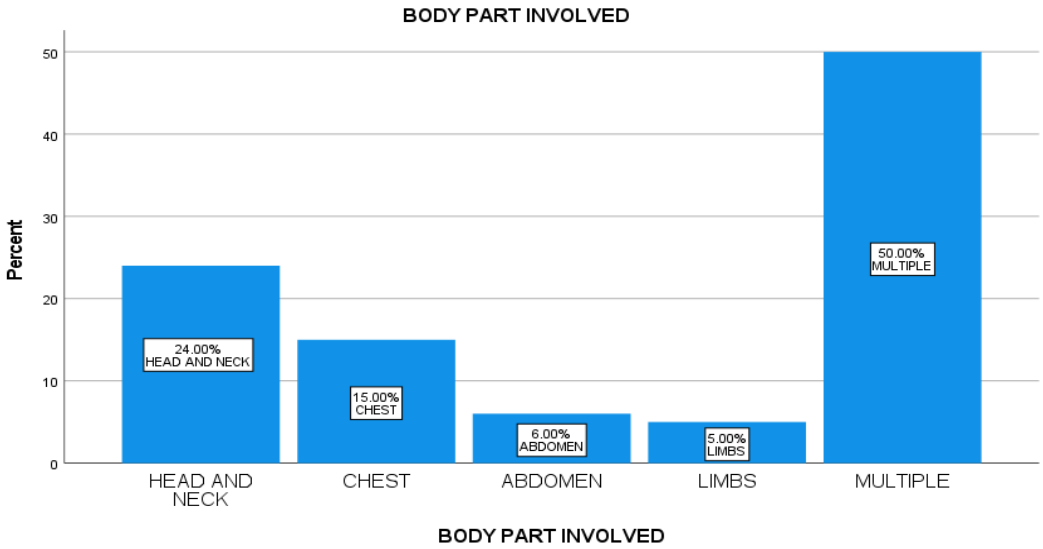

Figure 2 Distribution of entrance wounds

DISCUSSION

There is a variation in the incidence of firearm injuries from city to city, region to region and in different countries. This variation depends on the availability of firearm weapons and the region's legislative infrastructure. In the present study, the incidence of firearm fatalities was 10.03% of total medico-legal autopsies. This is considerably higher than the number of studies from other states and cities in India and other countries. The frequency of firearm-related deaths was 1.5% in Delhi as per the study by Kohli A,[4] 2.09% in a study done by Sachan R[5] in Kanpur, 1.5% in a study done by Kumar A[6] in Varanasi, and similarly in another study by Myint S[7] in Bangkok, the incidence was 2.01%. This difference could be explained by the separatist violence resulting in insurgency and counter-insurgency activities in Manipur, along with other illicit activities such as drugs and firearm trafficking due to the largely unfenced porous border. However, in Karachi, Pakistan, Mirza CF[8] observed the incidence of death due to firearms was 47.05%.

In the present study, male preponderance was observed. 94% of cases were male, and the most affected age group was 21-40 years, at 73%. Similarly, Myint S[7] noted 91.3% male and the most affected age range of 21-40 years. The age range of 21-40 years is life's most productive and active phase. They are also short-tempered, aggressive and more emotional than other extreme age groups; thus, they are

In our study, most of the victims were homicide deaths, with 87% of the cases. This result was like other Indian studies done by Kumari S,[9] Kohli A[4] and Sachan R[5] with 88.34%, 92.60% and 92%, respectively, reported as homicidal deaths. Similarly, in another study conducted in Karachi by Mirza CF,[8] 98.62% were declared homicidal deaths. However, according to different studies conducted in developed countries – Fowlera KA[10] in the United States, Toygar[11] and Canturk G[12] in Turkey – most of the victims were suicidal firearm deaths, with 62%, 41.80% and 32.85%, respectively. In the present study, there were 10% suicidal cases, of which 90% (n-8) were law enforcement agents. Easy access to firearms and mental burden while delivering services could be the main reasons behind the increase in suicidal patterns among security personnel.

On autopsy examination, rifled firearm injuries outnumbered shotgun injuries. Rifled firearms were used in the present study in 95% of the

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cases. This finding is similar to Hussain Z[13] and Kohli A,[4] with 96.40% and 82.2%, respectively, which reported rifled firearm injury in their studies. This is in partial agreement with Thube HR.[14] This is probably because rifled firearms are the weapon of choice for offence. However, in contrast to the studies of Akakpo PK[15] and Kumari S,[9] shotgun outnumbered rifle firearm injuries, with 85% and 60%, respectively.

The studies conducted by Kumari S,[9] Sachan R,[5] Shashikant KR[16] and Satyakam J[17] observed a single entry wound in most of the victims. On the contrary, in our study, 58% of victims had multiple entrance wounds. Out of the 87 homicidal cases, 56 (64.37%) had multiple entrance wounds, and 31 (35.63%) had a single entrance wound. A probable explanation could be that a firearm user targets the site properly. In homicidal cases, the assailant may use more than one shot to ensure the death of the victim, whereas in suicidal cases, the victim does not intend to use more than one shot, and neither gets a chance for another. Similarly, Patowary AJ[1] also noted 31.48% of single-entry wounds in homicidal cases. In suicidal cases, 80% had a single entrance wound, and 20% had multiple entrance wounds. In the study, Myint S[7] also noted single-entry (87.5%) and multiple-entry wounds (12.5%) in suicidal cases.

Out of a total of 100 cases in the present study, firearm entrance wounds were found involving more than one region of the body in 50 cases. However, in the remaining 50 cases, in 48% (n-24) of the cases, entrance wounds were found in the head and neck region, followed by the thorax region with 30% (n-15), and least involved were the limbs at 10% (n-5). Somewhat like our study, according to the study of Shirza N,[18] while discussing different regions of the body involved in firearm victims, they found multiple regions were affected in almost half the cases (48%), with the second most affected region being head and neck along with the trunk, followed by extremities.

The majority of cases in our study were homicidal, followed by suicidal deaths, and most of the shots were distant shots, with 84% of which 97.62% (82) cases were homicidal, and 02.38% (2) cases were accidental deaths. Similarly, the study conducted by Juglan S[19] also noted most of the victims of homicidal cases had distant shots. In the present study, homicidal and accidental cases had distant or near/close shots, and in suicidal cases, contact/near shots were observed. Our study shows a strong relationship between the range of fire and the manner of death.

Most of the victims in the present study were civilians, with 41% of cases, followed by law enforcement agents and militants, with 32% and 27%, respectively. Manipur is among the disturbed regions in India due to its separatist violence, illicit activities and unfenced porous border. So, there is a conflict, and none are immune in the conflict zone.

CONCLUSION

Gun violence causes irreparable harm to a community. Firearm injury reflects a state's socio-economic and existing law and political situation. Violence by firearm is preventable if the risk factors associated with firearms are documented and addressed and the existing law is amended promptly. Preventive measures such as proper psychological evaluation with mental support, improvement of socio-economic conditions and re-evaluation of existing laws and the political system to build an improved and effective framework for the prevention of gun violence may help to reduce the burden of violent deaths due to firearm injury.

AUTHOR DECLARATION

Ethical clearance: Taken from the Institutional Ethical Committee of Jawaharlal Nehru Institute of Medical Sciences, Porompat, Imphal, Manipur University.

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Contribution of authors: We declare that this work was done by the authors named in this article, and the authors will bear all liabilities about claims relating to the content of this article.

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