

Original Research Paper

Medico-legal Aspects of Firearm Injury Cases in Agra Region

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Abstract

Firearm injury is one of the important causes of morbidity & mortality in India. A detailed study of medico-legal parameters in firearm injuries cases in Agra region is still lacking. The study was conducted in S. N. Medical College & Hospital, Agra. All the firearm injury cases, from October 2006 to October 2008 were included. Victim's biological details, motive of injury, type of firearm used, shots, diurnal variation of injuries, sites of injury, wound examination and cause of death were studied. Out of 1919 injury cases reported, 240 (12.5%) cases were of firearm injury. In total 240 cases, 90% were male victims and the most common age group was 11-30 years (71.8%). Shotgun, country made gun known as 'kattas', were used in 60% cases. Single shot was present in most cases 228 (95%). The most common site of injury was abdomen (30.9%). The fatality rate was 1.2% and hemorrhagic shock (68.9%) as the most common cause of death. In the present study, homicidal motive was the most common in firearm injuries cases and shotgun/kattas was the most common weapon used, as it is indigenously manufactured in Agra region.

Key Words: Firearm injury, Firearms, Homicide, Shotgun

Introduction:

The fire was the greatest invention for the human civilization but the invention & evolution of the firearms has come as a curse to this world. It is one of the most dreaded weapons used by human being to kill themselves. Firearm injury is one of the important causes of morbidity and mortality in our country. There has been a continuous increase in the incidence of these injuries in recent years because of an increase in inter-personal violence dacoity, robberies, caste feuds, terrorism, easy availability of illegal country made guns 'Kattas' and refinement in ballistics- automatic & semi-automatic firearms (rifle, revolver & pistols).

Various medico legal parameters of firearm injuries & fatalities have been studied in different parts of the world & in India.

But a detail study with regional variations of the parameters of medico legal aspects of firearm injuries are still lacking. Therefore our objective was to study the pattern & various parameters of firearm injuries in Agra region elucidating the situation with regard to the extent & severity of the problem and comparing with the pattern seen in other regions.

Aims & Objectives:

- To study the ratio of firearms injury cases in relation with the other injuries
- To study the Victim parameters – sex, age, resident (rural/ urban) in firearm injury cases, motive/intent of firearm injury, type of firearm used, No. of the shots, diurnal variation of the firearm injuries, site of gunshot injuries, result of firearm injury, causes of death

Materials & Methods:

The study was conducted in S. N. Medical College & Hospital, Agra as tertiary health care centre for the entire Agra city and all surrounding rural areas. All the injury cases brought to the emergency department of S. N. Medical College & Hospital Agra, from October 2006 to October 2008 were included in the study. The cases of road traffic accidents and poisoning were excluded.

All the cases were examined and various parameters were noted and cause of death in case of fatality was established by the post-mortem examination.

1. Detailed History

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- Victim's data- age, sex, address
 - Motive – suicidal, accidental, homicidal
 - Suicidal- history of suicidal note, substance abuse, psychiatric disorders, previous suicidal attempts
 - Homicidal- history of robbery, dacoit, interpersonal violence, caste feuds, terrorism, mob or police firing
 - Accidental– injuries due to hunting, defective firearms, unsafe handling (cleaning/repairing, unloading, firing in parties)
 - Type of firearms used
2. Examination
- General examination of victim
 - Wound examination- number, site, size, number, margins, and presence of singeing, scorching, blackening, tattooing, abrasion collar, bleeding and associated injuries.
- All these findings were noted and photographed. Type of weapon used was assessed by examining the wound in detail.
3. Outcome
- Hospitalized and discharged/referred
 - Death- cause and manner of death established by post mortem examination.

Results:

A total of 1919 injury cases reported to the emergency department, 240 (12.5%) cases were of firearm injury, 1268 cases (66.1%) of hard & blunt object injury, 85 cases (4.4 %) of sharp & penetrating injury and 326 cases (17%) were due to burns. (Table 1)

In this study out of 240 cases, 216 (90%) victims were males and 28 (10%) were female. Most common age group victimized was 11-20 year (38.4%) and next common age group was 21-30 years (33.4%). (Table 2)

In the present study, 132 cases (55%) victim belonged to rural areas.

In our study out of 240 cases, 212 (88.34%) cases were of homicidal motive, 8 (3.4 %) cases of suicidal intent 16 (6.67%) cases of accidental firing and in 4 (1.67%) cases, intent could not be ascertained due to unavailable history. In all suicidal cases rifled firearm was used. (Table 3)

Shotgun, country made gun known as 'kattas', outnumbered the rifled firearm injuries (144 cases out of 240 cases (60%)). In 88 cases (36.67%) rifled firearm had been used and in 8 cases (3.34%) type of weapon could not be ascertained. (Table 3)

Most of the cases of gunshot injuries 228 (95%) were of single shot and 12 (5%) cases were of double firing. In all cases of

double firing rifled firearm was used. No case was reported with multiple firing. (Table 3)

The maximum numbers of firearm injury cases were reported during night hours 12am-12pm a total of 140 cases (>50%). (Table 4)

On wound examination, the most common site for firearm injury was abdomen, seen in 116 (30.9%) cases, followed by thorax in 21% cases and head in 16 % cases. (Table 5)

Single entry wound was observed in 74.6%, double entry wound were in 6.8% and multiple entry wound in 18.6% of cases.

Exit wound found in 60 cases only. Out of 60 cases of exit wounds single exit wound found in 52 cases (86.7%), while double exit wound found in rest of 8 cases (13.3%).

There was no case with multiple exit wound. In most of the firearm injury cases, it was close shot, 128 (53.3%). Blackening and tattooing were seen in 68 (53.1%) of these close shot cases. Out of 212 homicidal cases, in 120 (56.6%) cases, close shot injury was observed.

Most of the cases 131 (54.6%) were discharged after appropriate treatment. The fatality rate was 1.2% (29 cases). The most common cause of death on post-mortem examination was hemorrhagic shock (68.9%) in this study. (Table 6)

Discussion:

Male outnumber females in cases of firearm injuries. In the present study most common age group victimized was 11-20 year (38.4%) and next common age group was 21-30 years (33.4%), hence the total number of cases in both the group (11-30 yrs) constitute the maximum number of cases (71.8%) reported similar to the findings of other studies. [1-5] (Table 7)

Most of the cases belong to rural areas due less strict law and order, lower literacy and high unemployment rates. In the present study homicidal cases due to firearm injuries were 88.34%. This result was similar to other the Indian studies done by Kohli A et al [4] 92.6%, Singh B P et al [5] 70%, however is much higher than the US statistics. [2]

The incidence of homicidal injuries in our region is due to large usage of unlicensed, country made guns, which are cheap, easy to procure and destroy.

In the present study, Suicidal cases caused by firearm were 3.4%, as seen in other Indian studies Kohli A et al [4] 6.5%, Singh B P et al [5] 3.0%) in contrast to US statistics [2], suicidal cases due to firearm were 56.1%.

In our study, a small proportion of people are committing suicide by firearm

because people tend to use cheaper methods like hanging and poisoning.

Most common firearm used in various studies was rifled firearm in US [2] 82.1%, Kohli [4] 82.2%, Hussain [5] 96.5%). However in our study was shotgun was most commonly used in 60% cases, as indigenously manufactured in our region. Close shot was observed in most of homicidal cases (56.6%) in the present study similar to the finding of other studies. [6]

Most common site of injuries was abdomen in our study, while chest was most common site of injury in other studies. [4-5]

Hussain [3] reported maximum case of head and neck injuries. Death in cases of firearm injuries can be due to hemorrhagic shock, head injuries, septicemia, and respiratory failure. Haemorrhagic shock is the most common cause of death in the present study. [7]

Conclusion:

In the present study, homicidal motive was common in firearm injury cases in Agra region and Shotgun/kattas was the most common weapon used, as it is indigenously manufactured in this region.

Country made firearms are cheap, easily available and easier to be destroyed. Strict laws may help reducing the production of country made firearms. Authorities issuing license for possession of firearms need to be more strict and vigilant. These steps may help in reducing the burden of firearm injury cases.

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Table 1: Firearm Injuries Related to Other Injuries

Types of Injuries	Cases	%
Hard & blunt objects	1268	66.1%
Bum	326	17%
Firearms	240	12.5%
Sharp & penetrating	85	4.4%
Total	1919	100

Table 2: Age and Sex wise Distribution

Age Group(Yrs)	Male	Female	Total (%)
0 -10	12	0	12(5%)
11-20	84	8	92(38.4%)
21-30	68	12	80(33.4%)
31-40	16	0	16(6.7%)
41-50	16	0	16(6.7%)
51-60	8	4	12(5%)
>60	8	4	12(5%)
Total	212 (90%)	28(10%)	240(100%)

Table 3: Parameters of Firearm Injuries

S.N.	Parameters	No.	%
1.	Motive of firearm injuries		
	Homicidal	212	88.34
	Suicidal	08	3.4
	Accidental	16	6.67
	Others (insufficient information)	04	1.67
	Total	240	100
2.	Type of Firearm used		
	Shotgun (smooth bored)	144	60.0
	Rifled	88	36.67
	Cannot be ascertained	08	3.34
	Total	240	100
3	Number of Shot		
	One	228	95.0
	Double	12	5.0
	Multiple	00	0.0
	Total	240	100
4.	Range of Shot		
	Contact	20	8.3
	Close	128	53.3
	Distant	88	36.7
	Undetermined	4	1.7
	Total	240	100

Table 4: Time of Firearm Injury

Time	Cases	%
12AM-6 AM	68	28.3
6AM – 12 PM	72	30
12 PM - 6 PM	40	16.7
6 PM- 12 PM	60	25.0
Total	240	100

Table 5: Distribution of Entry and Exit Wounds on Different Body Parts

Parts of Body	Entry Wound	Exit Wound	Total (%)
Head	56	4	60(16)
Neck	12	4	16(4.3)
Thorax	60	16	76(20.3)
Abdomen	96	20	116(30.9)
Upper limb	52	24	76(20.3)
Lower limb	32	0	32(8.5)
Total	308	68	376

Table 6: Result of Firearm Injury

Outcome (n=240)	No.	%
Discharged after treatment	131	54.6%
Referred to higher center	80	33.3%
Death	29	1.2%
Total	240	100
Cause of Death(n=29)		
Haemorrhagic Shock	20	68.9%
Head injury	5	17.2%
Septicemia	3	10.3%
Respiratory Failure	1	3.4%

Photo 1: Entry wound of 1.5 cm.X1.5cm size at angle of Mandible with inverted margins, Type of fire arm used: Rifled Firearm, Homicidal Motive with Single Close Shot



Photo 2: Exit wound of 3.0 cm X 3.5 cm size near Right Ear (tragus) with everted margins, Type of fire arm used: Rifled Firearm, Homicidal Motive with Single Close Shot



Photo 3: Entry Wound of 2.5 cm. X 2.5cm size on abdomen 18 cm from umbilicus at 2 'o clock position with inverted margins, Type of firearm used: Shotgun, Homicidal Motive & Single Contact shot



Photo 4: Entry wound of 2.5 cm. X 3.0cm size on chest right side of sternal angle with inverted margins and spurting of blood



**Table 7
Comparison of Parameters in Different Studies**

S.N	Parameters	FBI U.S	Hussain	Kohli A	Singh B	Present study
1.	Sex Male Female	NA NA	85.2% 14.8%	90.7% 9.3%	78% 13%	90% 10%
2.	Rural Urban	NA NA	63% 37%	NA NA	NA NA	55% 45%
3.	Most common age group/ Mean Age	15-29 (54%)	16-30 (42%)	21-30 (46.7%)	Male:31 years, Female:24 years	11-30 (71.8%)
4.	Motive Homicidal Suicidal Accidental	40.8% 56.1% 2.4%	70% - -	92.6% 6.5% 0.9%	70% 3.0% 19%	88.3% 3.4% 6.67%
5.	Rifled Shotgun Can't be ascertained	96.5% 5.1% 13.2	82.1% 3.5% -	82.2% 17.8% -	-	40% 60%
6.	Single shot Double shot Multiple shot	NA	NA	100% nil nil	80% 8% 5%	95% 5% Nil
7.	Most common site of injury	Head and neck	Head and neck	Chest	Chest	Abdomen