



A TWO YEAR SHARP FORCE FATALITIES STUDY AT A TERTIARY CARE CENTRE OF CENTRAL INDIA.

Forensic Medicine

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ABSTRACT

The objective of this research is to study the pattern of injuries caused due to sharp edged and sharp pointed objects / weapons and to co - relate the pattern of such injuries with the manner of death. Therefore, a retrospective study was conducted at the Forensic Medicine department of government medical college and hospital, Nagpur, Maharashtra, India during the time period of January 2023 to January 2020. Post mortem examination records of 75 cases that were autopsied at the mortuary of the Forensic Medicine department of government medical college and hospital, Nagpur were thoroughly examined for studying the pattern of sharp force fatalities caused due to the impact of sharp edged and sharp pointed objects. The analysis of the autopsy reports of the 75 cases, revealed that the maximum number of deceased died due to homicide were males (54, 72%). Maximum number of deceased (28) died due to homicide with 02 to 10 sharp force injuries over their body. Maximum males (14, 18.66%) died due to single homicidal stab injury in the age group of 20 to 29 years. Maximum males (06, 18.66%) died due to a combination of incised and stab injury, in homicidal manner of death and belonged to the age group of 20 to 29 years. Maximum males (03, 18.66%) died due to a combination of all three sharp force injuries (incise, stab and chop) in homicidal manner of death and who belonged to the age group of 20 to 29 years. There exists a significant co relation (p value 0.008318) between all the three types of manner of death (accident, suicide, and homicide) and incised injury (p value 0.008318).

KEYWORDS

Sharp force injury, homicide and autopsy.

INTRODUCTION

Sharp force injuries (SFIs) are defined as injuries inflicted by a sharp instrument, usually cutting, stabbing or chopping in nature. The term "sharp force injury" encompasses essentially three separate but related injury types viz. stab, chop and incised injury. An incised wound is a clean cut wound through the tissues wherein; length is the maximum dimension. A stab wound is one which has depth as its maximum dimension. Chop wounds are deep gaping wounds which are caused by a blow with the sharp - cutting edge of a heavy weapon, like an axe, sword etc.

Deaths due to sharp force injuries are less common than those due to blunt trauma, gunshot wounds and drug toxicity. The frequency of such deaths varies from one jurisdiction to another. Sharp force fatalities are seen mostly in homicides, followed by suicides and rarely in accidents too. The object / weapon involved in such sharp force fatalities can be knife, screw driver, scissor, shaving razor blade etc., which are commonly used in our day to day life.

Detailed examination of sharp force injuries, particularly in homicides, can provide useful information, regarding the type of weapon / object that were likely involved in inflicting such wounds etc. This information can potentially guide the police to the recovery of a murder weapon, or it can be used to exclude other objects, that are recovered from a crime scene.

MATERIAL AND METHODS

The present study was undertaken in the department of Forensic Medicine and Toxicology, government medical college and hospital, Nagpur, Maharashtra, India. All the 75 fatal sharp force injuries brought for medicolegal autopsy during the past two years (January 2020 to January 2022) were included in the study. This small sample size could be attributed to the 'Covid 19 pandemic, that was at its peak, during the beginning of the years 2020 and 2021, during which the post mortem autopsy examination of the deceased were not done [due to the stringent guidelines issued by ICMR (Indian council of medical research), DMER (Directorate of medical education and research, Mumbai) and DHS (Directorate of health services, Mumbai)]. The data was collected from the autopsy reports, police inquest dossiers and information from the relatives and police.

Highly decomposed and skeletonised bodies in which the sharp force injuries cannot be appreciated are not included in this study.

The variables considered for this study included gender, age, injury pattern, cause of death, objects / weapons involved in such sharp force fatalities. The findings are expressed in numbers and percentages in a proforma that was meticulously designed for the above study. The results and observations were analysed regarding the pattern of sharp force injuries and their co - relation with the manner of death.

Table 1: Distribution Of Age, Sex And Manner Of Death.

Serial no.	Age group in years	Homicide		Suicide		Accident	
		Male	Female	Male	Female	Male	Female
1	0 to 9	0	1	0	0	0	0
2	10 to 19	7	2	0	0	0	0
3	20 to 29	29	2	2	0	3	0
4	30 to 39	8	1	2	0	0	0
5	40 to 49	6	2	3	0	0	0
6	50 to 59	2	0	0	0	0	0
7	60 to 69	1	1	1	0	0	0
8	70 to 79	1	1	0	0	0	0

The table no. 01 shows that maximum individuals died of homicide (64, 85.33%), followed by suicide (07, 09.33%) and accident (03, 04%). Males outnumbered females in all the three types of deaths. The age group of 20 to 29 years (both for males and females) remains the most vulnerable for such sharp force fatalities.

Table 2: Distribution Of Location Of All Sharp Force Injuries.

Serial no.	Body part involved	Number of injuries	Percentage
1	Head	11	5.88
2	Neck	40	21.39
3	Face	20	10.7
4	Chest	35	18.72
5	Abdomen	27	14.44
6	Back	17	9.09
7	Upper and lower limbs	37	19.79
8	Genitals	0	0
	Total	187	100

The table no. 02 shows that, amongst all the manner of death (accident, suicide and homicide) caused due to all sharp force injuries (stab, chop and homicide) neck is the region that is injured most of the times (40, 21.39%).

Table 3: Distribution Of Internal Organs / Blood Vessels Injured By All The Three Types Of Sharp Force Injuries.

Serial no.	Organs	Number of injuries	Percentage
1	Brain	1	1.19
2	Heart	11	13.1
3	Lungs	26	30.95
4	Spleen	13	15.48

5	Kidneys	5	5.95
6	Git	4	4.76
7	Neck vessels	22	26.19
8	Extremity vessels	2	2.38
	Total	84	100

The table no. 03 shows that, that lungs are injured most of the times (26, 30.95%) followed by blood vessels of the neck (22, 26.19%).

Table 4: Distribution Of Age, Sex, Manner Of Death Caused Due To A Single Sharp Force Injury.

	Homicidal incised		Suicidal incised		Accidental incised		Homicidal stab		Suicidal stab		Accidental stab		Homicidal chop		Suicidal chop		Accidental chop	
Age group In years	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
0 to 9	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 to 19	0	1	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0
20 to 29	3	0	0	1	1	0	14	2	0	0	2	0	1	0	0	0	0	0
30 to 39	2	1	2	0	0	0	3	0	0	0	0	0	1	0	0	0	0	0
40 to 49	0	2	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
50 to 59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60 to 69	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
70 to 79	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

Table no. 04 shows that, out of the 75 deceased individuals the maximum number of males (14, 18.66%) died due to homicidal stab injury in the age group of 20 to 29 years.

Table 5: Distribution Of Age, Sex, Manner Of Death Caused Due To A Combination Of Couple Of Sharp Force Injuries.

	Homicidal incised + stab		Suicidal incised + stab		Accidental incised + stab		Homicidal stab + chopped		Suicidal stab + chopped		Accidental stab + chopped		Homicidal incised + chopped		Suicidal incised + chopped		Accidental incised + chopped	
Age group In years	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
0 to 9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 to 19	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 to 29	6	0	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0
30 to 39	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40 to 49	1	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
50 to 59	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
60 to 69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70 to 79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

The table no. 05 shows that, maximum number of males (06, 18.66%) died due to a combination of incised and stab injury, in homicidal manner of death in the age group of 20 to 29 years.

Table 6: Distribution Of Age, Sex, Manner Of Death Caused Due To A Combination Of All Three Types Of Sharp Force Injuries.

	Homicidal incised + stab + chopped		Suicidal incised + stab + chopped		Accidental incised + stab + chopped	
Age group in years	Male	Female	Male	Female	Male	Female
0 to 9	0	0	0	0	0	0
10 to 19	1	0	0	0	0	0
20 to 29	3	0	0	0	0	0
30 to 39	0	0	0	0	0	0
40 to 49	2	0	0	0	0	0
50 to 59	0	0	0	0	0	0
60 to 69	0	0	0	0	0	0
70 to 79	0	0	0	0	0	0

The table no. 06 shows that out of 75 deceased individuals the maximum number of males (03, 18.66%) died due to a combination of all three sharp force injuries in homicidal manner of death who belonged to the age group of 20 to 29 years.

Table 7: Co Relation Of Manner Of Death With The Pattern Of Injury

Injury	Present / absent	Accident	suicide	Homicide	Total	P value
STAB	Present	2	0	28	30	0.127198
	Absent	1	8	36	45	
Incised	Present	1	5	10	16	0.008318
	Absent	2	3	54	59	
Chop	Present	0	0	4	4	0.368191
	Absent	3	8	60	71	

STAB + INCISED	Present	0	3	11	14	0.206395
	Absent	3	5	53	61	
Stab + chop	Present	0	0	1	1	0.162503
	Absent	3	8	63	74	
Incised + chop	Present	0	0	6	6	0.976239
	Absent	3	8	58	69	
Incised + chop + stab	Present	0	0	4	4	0.489500
	Absent	3	8	60	71	

Incised wound is inflicted in 01 (01.33%), 05 (06.66%) and 10 (13.33%) persons who have died in homicides, suicides, and accident respectively. It is interesting to find that there is a significant co relation in between the manner of death (accident, suicide, and homicide) and incised injury.

The other sharp force injuries like stab and chop (either in single or in combination with incised injury) are not present in all the three manners of death viz. accident, suicide and homicide. Therefore there does not exist any significant co – relation in between these injuries and manner of death.

DISCUSSION

The age and gender profile in our study is highly inclined towards the male gender, who belonged to the young age group of 20 to 29 years. The propensity of young males being more subjected (and even subjugated too !) to sharp force injuries, is in sync with the study of Agnihotri et al⁰¹.

In our study the maximum number of males died due to homicides shows the extreme form of formidable violence, wherein; the enraged assailant is frantically driven with retribution, for incessantly inflicting such injuries on the victim. The higher number of homicides is in line with the studies conducted by Kemal et al⁰² and Vassalini et al⁰³.

Neck and lungs are the external body parts and internal organs respectively to be maximally insulted and inflicted, with the wrath of sharp force injuries. Our findings resonate with the study conducted by

Karger B et al⁴ and Mansoa et al⁰⁵. However Kemal CJ et al⁰² have found extremities and heart to be prominently injured, at majority of times during their course of study. This contrast in the observations can be explained by, the western socio demographic parameters of circumstances prevailing at the time of such fatalities, relative position and psyche of the assailant and victim etc, which do not resemble with our south Asian societal and psychological structural framework.

Amongst the category of single sharp force fatalities, it the young males in the age group of 20 to 29 years, who have been predominantly inflicted with homicidal stab injury. In the category of double sharp force fatalities, it again the young males in the age group of 20 to 29 years, who have mostly been inflicted with homicidal combination of stab and incised injury. Similarly; amongst the category of triple sharp force fatalities, it is again young males in the age group of 20 to 29 years, who have been mostly inflicted with homicidal combination of stab, incised and chop injury. The distribution of age, sex, pattern of sharp force injury and manner of death is in sync with the studies conducted by Marak FK et al¹, Brunel et al⁶ and Mitton et al⁷.

Amongst all the three types of sharp force fatalities it is the incised injury that is found in every manner of death viz. suicide, accident and homicide. It is interesting to find that there is a significant statistical co relation ($p = 0.008318$) in between all the manners of death (accident, suicide, and homicide) and incised injury. This statistical co relation is a novel factor that has been newly introduced in the arena of studying such sharp force fatalities by us. It is expected that such statistical studies should be further carried out in order to approve or disprove our confirmational findings.

CONCLUSIONS

The present study addressed the demographics, location, wound type, organs injured, wound number and co – relation in between the sharp force injuries and manner of death and compared them with previous studies. In summary, the data obtained in this study, in conjunction with that obtained in previous studies, show the following:

- 1). Males are more involved in sharp force fatalities as compared to females vis a vis age and manner of death.
- 2). Young males remain vulnerable to the wrath of sharp force injuries than their older counterparts.
- 3). Homicides occur more frequently than the suicides.
- 4). Incised wound is present in every manner of death and there is a significant co relation in between them.

Although such epidemiological data, can be helpful in summarizing large case samples, the conclusion of the manner of death involves a thorough investigation into the circumstances of death in conjunction with a detailed autopsy examination and should never be determined based on statistical probabilities alone.

REFERENCES

1. Agnihotri AK., Choudhury, Tabin M, Murty OP. Sharp force fatalities in south Delhi. International Journal of Medical Toxicology and Legal Medicine. Volume 3, No 2, Jan - June, 2001.
2. Kemal CJ, Patterson T, Molina DK, Deaths due to sharp force Injuries in Bexar County, Texas, with respect to manner of death. Am J Forensic Med Pathol 2013 Sep;34(3): 253 - 9.
3. Vassalini M, Verzeletti A, and Ferrari FD. Sharp force injury fatalities: A Retrospective Study (1982—2012) in Brescia (Italy). J Forensic Sci, November 2014, Vol. 59, No. 6.
4. Karger B, Rothschild MA, Feiffer H. Accidental sharp force fatalities, beware of architectural glasses and not knives. Forensic science international 123 (2001) 135 — 139.
5. Mansoa NL, Ribeiro IP, Inácio AR. Sharp force fatalities: Differentiating homicide from suicide through a retrospective review (2012—2019) of autopsy findings in Lisbon (Portugal). Forensic Science International (2021) Oct; 327 110959
6. Marak FK., Maychet SM, Momonchand A. Fatal sharp force injuries 12 years review. International Journal of Medical Toxicology & Legal Medicine. 2005, ISSN : 0972-0448 Volume : 8, No. 1, July - December 2005.
7. Brunel C, Fermanian C, Durigon M, Grandmaison GL. Homicidal and suicidal sharp force fatalities: Autopsy parameters in relation to the manner of death. Forensic Science International 198 (2010) 150—154.
8. Mitton L, Prinsloo LT. Sharp force fatalities at the Pretoria Medico-Legal Laboratory, 2012—2013. S Afr J Surg 2016;54(2).
9. Thomsen AH , Hougen HP, Villesen P, Brink O, Leth PM. Sharp Force Homicide in Denmark 1992—2016. November 2019. Journal of Forensic Sciences 65(7502).
10. Jat VK, Punia RK. Socio-demographic profile of fatal and non-fatal cases of sharp weapon trauma at S.M.S. medical college & hospital, Jaipur during the Year 2015-16. Medico-legal Update, January-June 2018, Vol.18, Issue 1, 215—219.
11. Terranova C , Doro L, Zancaner S, Zampini T, Mazzarolo C, Bonvicini B, Viero A, Montisci M. Criminological and Medico - legal Aspects in Homicidal and Suicidal Sharp Force Fatalities. J Forensic Sci, 2020 Jul; 65(4) 118—119.
12. Goodalla CA, MacFieb F, Conway DI, McMahon AD, Assault—related sharp force injury among adults in Scotland 2001—2013: Incidence, socio-demographic determinants and relationship to violence reduction measures. Aggression and Violent Behavior Volume 46, May June 2019, 190—196.
13. Selvaraja GR, Jih PK, Subramaniam K, Ibrahim NB. A Case of suicide with multiple stab wounds. Sept 2019, J Forensic sci. Med, 5(3).
14. Gharedaghi J, Ghorbani M, Akhlaghi M, Yousefinejad V, Paezi M. Epidemiology of

Homicide by Sharp Force in Tehran, Iran between 2010 and 2011. July 2013, Indian Journal of Forensic Medicine & Toxicology. 7 (2): 51.

15. Karlsson T. Sharp force homicides in the Stockholm area, 1983—1992. Forensic Science International (1998) Jun 8; 94 (1 - 2):129—139.
16. Kitulwatt ID, Edirisinghe PA. Relationship of sharp force injuries to motivation. Medico-Legal J 2015, Vol. Sep; 83(3): 159—162.
17. Al-Yousif ZA, Al-Qazzaz MA. Medico-legal study of fatal incised wounds in Baghdad. IRAQI J MED SCI, 2012; VOL. 10 (4): 328—333.
18. Memon A, Kazi MA, Shaikh W. Prevalence of Homicidal Injuries by Sharp Force Trauma at Sukkur. J Liaquat Uni Med Health Sci 2015; 14 (01): 3—5.
19. Sadia S, Siddiqui BA, Naheed K, Qasim AP, Naqvi F, Tariq F. Demographic profile of fatal sharp force injuries: autopsy study at Tertiary Care Hospital. Professional Med J 2020; (11): 2399-2402.
20. Karger B, Niemeyer J, Brinkmann B. Suicides by sharp force: typical and atypical features. Int J Legal Med (2000) 113 :259—262. 18.
21. Prahlow JA, Ross KF, Lene WJ, Kirb DB Accidental sharp force injury fatalities. The American Journal of Forensic Medicine and Pathology 22(4):358—366, 2001.