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PATTERNS OF SHARP FORCE HOMICIDES: DEMOGRAPHIC TRENDS, INJURY CHARACTERISTICS, AND WEAPON USAGE IN A RETROSPECTIVE FORENSIC ANALYSIS

Forensic Medicine

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ABSTRACT

This retrospective study details the findings of sharp force homicides, focusing on demographic patterns, injury characteristics, and weapon usage. Examining autopsy reports from January 2018 to December 2022, the research reveals a distinct male predominance, consistent with broader homicide trends. Notably, a significant concentration of victims within the 21-40 age group underscores the potential association between these demographic and violent acts. The thorax emerges as the primary site of injury, potentially reflecting intentional targeting or the elevated mortality associated with chest injuries. Stabbings constitute a substantial portion of homicidal assaults, with a prevalence of 46.42%, and incised wounds at 53.57%. Comparable patterns are observed in the anatomical distribution of injuries, with stabbings prevalent in the thorax, abdomen, and lower limbs, while incised wounds are more common in the head, neck, and upper limbs. The knife emerges as the predominant weapon, utilized in 93.75% of cases, emphasizing its significance in sharp force homicides. These findings contribute valuable insights into the demographic and injury patterns of sharp force homicides, informing forensic investigations and preventive strategies tailored to specific age groups, injury locations, and weapon types.

KEYWORDS

Sharp force trauma; Homicide; Stab wounds; Incised wounds

INTRODUCTION

Sharp force trauma is a prevalent form of severe interpersonal injury that often results in fatality[1]. Such injuries are categorized into stab wounds, characterized by deep wound tracts from thrusting sharp objects, and slash wounds, involving relatively superficial cuts or incised wounds from the sharp edge[2]. The commonly employed weapon in these incidents is a knife, easily accessible in households and requiring no specialized skills or significant funding[3]. When investigating fatalities resulting from sharp force trauma, acquiring detailed information about the weapon, the circumstances surrounding the death, and the number and specific locations of sharp force wounds becomes crucial[1,4]. The impact of these changes on the epidemiology of sharp force homicides remains uncertain.

MATERIAL AND METHODS

A comprehensive retrospective review of all autopsy reports pertaining to homicides resulting from sharp force trauma was conducted, encompassing the period from January 2018 to December 2022. The autopsy report were reviewed at the Department of Forensic Medicine, Maulana Azad Medical College, New Delhi. Among a total of 3699 cases, 16 sharp force homicides were identified during the study duration. Inclusion criteria involved deaths with a determined homicidal manner, established through thorough external examination or forensic autopsy, and cases where complete demographic, circumstantial, and autopsy information was available. The review process focused on gathering pertinent details, including demographic and circumstantial factors such as gender, age, and type of weapon used. Autopsy-specific information was also meticulously collected, encompassing the number and anatomical distribution of stab and incise wounds, injured anatomical organ structures, and the affected circulatory system. Stab wounds were differentiated from incise wounds based on their depth and length characteristics. The anatomical distribution of these wounds was systematically categorized into nine regions: Head & Face, Neck, Chest, Abdomen, Pelvis, Lower Limbs, Upper Limbs, Upper Back, and Lower Back. This review aimed to provide a comprehensive understanding of the patterns and characteristics associated with sharp force homicides during the specified timeframe.

RESULT

Age & Gender Distribution

The data table 1 illustrates the distribution of sharp force trauma homicides across different age groups and gender categories. Within the age group of 1-20 years, there were no reported cases for either males or females, resulting in a total of 0 (0.0%). In the 21-40 age bracket, there were 10 male victims and 2 female victims, contributing to a total of 12 cases (75%). For individuals aged 41-60, 1 male and 2 females were victims, amounting to a total of 3 cases (18.75%). In the age group exceeding 61 years, there was 1 male victim, with no reported female victims, resulting in a total of 1 case (6.25%). The cumulative total across all age groups indicates 12 male victims and 4 female victims, summing up to a total of 16 cases. The data provides insights into the distribution of sharp force trauma homicides, highlighting variations across different age brackets and gender categories.

Table No 1 Age And Gender Distribution Of Sharp Force Homicides

Age Group	Male	Female	Total
1-20	0	0	0(0.0%)
21-40	10	2	12(75%)
41-60	1	2	3(18.75%)
>61	1	0	1(6.25%)
Total	12	4	16

Distribution Of Injuries Over Body By Sharp Force

The presented data table 2 shows the incidence of injuries based on incise and stab mechanisms across distinct regions of the body. In the Head & Face region, there are 18 incise injuries, representing 30% of the total for this category, while stab injuries account for 3 cases, constituting 5.76%. Within the Neck region, 8 incise injuries (13.33%) and 4 stab injuries (7.69%) contribute to a combined total of 12 injuries (10.71%). The Chest region displays 12 incise injuries (20%) and 13 stab injuries (25%), totaling 25 injuries (22.32%). Abdominal injuries include 4 incise cases (6.67%) and 11 stab cases (21.15%), summing up to 15 injuries (13.39%). Other regions, such as the Pelvis, Lower Limbs, Upper Limbs, Upper Back, and Lower Back, also exhibit varying proportions of incise and stab injuries. The comprehensive data concludes with a total of 60 incise injuries and 52 stab injuries, resulting in 112 injuries across the specified regions of the body.

Table No 2 The Distribution Of Injuries Over Body By Sharp Forces

Region of body	Incise injuries	Stab injuries	Total
Head & Face	18(30%)	3(5.76%)	21(18.75%)
Neck	8(13.33%)	4(7.69%)	12(10.71%)

Chest	12(20%)	13(25%)	25(22.32%)
Abdomen	4(6.67%)	11(21.15%)	15(13.39%)
Pelvis	1(1.67%)	2(3.84%)	3(2.67%)
Lower limbs	4(6.67%)	4(7.69%)	8(7.14%)
Upper Limbs	7(11.67%)	2(3.84%)	9(8.03%)
Upper Back	3(5%)	5(9.61%)	8(7.14%)
Lower Back	3(5%)	8(15.38%)	11(9.82%)
Total	60(100%)	52(100%)	112(100%)

Organ Involved In Sharp Force Injuries

Table 3 provides a comprehensive overview of the organ systems involved in sharp force injuries, presenting the number of injuries and their respective percentages. The Brain is affected in 4 cases, representing 4.59% of the total injuries. The Neck region demonstrates the highest incidence with 16 injuries, constituting 18.39%. Lungs follow closely with 26 injuries, representing 29.88% of the total. The Heart is implicated in 10 cases, accounting for 11.5%. Liver injuries contribute to 7 cases, making up 8.04%, while the Stomach and Pancreas each show 4.59% and 1.14%, respectively. Additionally, the Spleen and Kidney each account for 1.14%, and Intestine injuries make up 18.39%. The cumulative total of injuries across these organ systems is 87, providing a comprehensive insight into the distribution and prevalence of sharp force injuries across various vital organs.

Table No 3 Organ System Involved In Sharp Force Injuries.

Organ system	Number of injuries (n%)
Brain	4(4.59)
Neck	16(18.39)
Lungs	26(29.88)
Heart	10(11.5)
Liver	7(8.04)
Stomach	4(4.59)
Pancreas	1(1.14)
Spleen	1(1.14)
Kidney	2(2.29)
Intestine	16(18.39)
Total	87(100)

Circulatory System Involved In Sharp Force Injuries

The data table 4 presents the distribution of injuries by sharp force within the circulatory system, categorized by anatomical regions. Head and Face injuries account for 12 cases, constituting 12.76% of the total. The Neck follows closely with 11 injuries, representing 11.70%. The Thorax exhibits 22 cases, the highest percentage at 23.4%. Upper Limbs and Lower Limbs contribute 10 (10.63%) and 9 (9.57%) injuries, respectively. The Heart and Abdomen both show 10.63% of the total with 10 cases each. In summary, a total of 94 injuries were documented across these anatomical regions, providing a comprehensive overview of the distribution of injuries within the circulatory system.

Table No 4 : Circulatory System Involved By Sharp Force Trauma.

Circulatory system	Number of injuries by sharp force(n%)
Head & Face	12(12.76)
Neck	11(11.70)
Thorax	22(23.4)
Upper Limbs	10(10.63)
Lower Limbs	9(9.57)
Heart	10(10.63)
Abdomen	20(21.27)
Total	94(100)

Weapon Used To Produce Injuries

The weapon was known in 15(93.75%) cases and not known in 1(10.78%) cases out of 16(100%) cases. A single weapon was used in 13(86.66%) cases, whereas in 2(13.33%) cases, weapons were used in combination. A knife was used in 13 (86.66%), followed by an axe in 1(6.67%), an ice pricker & blade in 1(6.67%) case.

DISCUSSION

In the context of sharp force homicides, a distinctive male predominance was evident, aligning with broader patterns observed in homicides, particularly peaking in the third and fourth decades of life[5-8]. Our study further corroborates this trend, revealing a significant prevalence of male victims, primarily within the age range of 21-40 years. This finding resonates with previous research by Fischer et al.[7], Rouse[9], Rogde et al.[10], and Hunt and Cowling[11], all of whom noted a concentration of sharp force victims within the 21-30 age group, attributing this phenomenon to the propensity for violent behaviors in this demographic. The thorax emerged as the most frequently affected region in sharp force injuries, consistent with findings from other series [9-12]. This may stem from the targeted selection of the thorax/head as injury sites or the inherent high mortality associated with chest injuries. Stabbings were the predominant mode of homicidal assault, accounting for 46.42% of cases, with fatal incised wounds observed in 25.3%. These results echo patterns identified in Toyama Prefecture, Japan, by Kominato et al.[8], where stabbings were prevalent over the thorax, abdomen, and lower limbs, while incised wounds were more common in the head, neck, and upper limbs. The weapon of choice in the majority of sharp force homicides was the knife, constituting 93.75% of cases, aligning with the findings of Rogde et al.[10]. These insights not only contribute to our understanding of the demographic and injury patterns in sharp force homicides but also underscore the prominence of specific age groups, injury locations, and weapon types that demand targeted attention in forensic investigations and preventive strategies.

CONCLUSION

In conclusion, the study conducted a thorough retrospective analysis of autopsy reports related to sharp force injuries over the period from January 2018 to December 2022. The findings reveal a diverse pattern of injuries across different anatomical regions and organ systems. The majority of injuries occurred in the Neck region, emphasizing the vulnerability of this area to sharp force trauma. Lungs were also prominently affected, underscoring the potential severity of injuries to vital respiratory organs. Notably, the Brain, Heart, Liver, and Intestine were identified as significant sites of injury, contributing to the overall complexity of sharp force cases. The age distribution indicated a concentration of incidents in the 21-40 age group. Gender-wise, the majority of cases involved male victims. The detailed examination of demographic, circumstantial, and autopsy information provided a comprehensive understanding of the characteristics and patterns associated with sharp force homicides. These findings contribute valuable insights to forensic medicine, aiding in the development of targeted investigative and preventive strategies in cases of sharp force injuries.

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Source Of Funding: NIL

Ethical Consideration: Retrospective study hence no ethical clearance required.

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