



International Journal of Health Research and Medico-Legal Practice

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RESEARCH PAPER

A study on the pattern of injuries in homicidal deaths at MBS hospital associated with Government Medical College Kota, Rajasthan

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Received on: Oct 20, 2019

Editorial approval on: Jan 30, 2020

Checked for plagiarism: Yes

Peer review: Double-blinded

Peer review comments: Five

Editor who approved:

Prof. Putul Mahanta

Background and aims: Violence is a significant health problem, and culpable homicide is the severest form of violence and prevalent worldwide. There are several motives for committing a culpable homicide. The numbers of culpable homicide are increasing day by day due to rapid urbanisation, increase life stress, unemployment and drug addiction. The present study aims at determining the pattern of injuries in homicidal death in the Kota region. **Materials and methods:** The present study was conducted in the department of forensic medicine and toxicology at MBS hospital Kota for a period from Jan 2017 to Dec 2018. Homicidal deaths due to mechanical injuries were included in the study. Detail information regarding crime circumstances was sought out from police/magistrate inquest, complete history, treatment record and post mortem examination. Prior permission from the research review board and the ethical committee was obtained.

Results: In the present study, 67 cases of homicide were studied. Head and face were observed as the most common body part targeted in 32(47.8%) deaths. Chest and the abdominal region was the preferable site for sharp injuries for 21 cases, followed by four subjects' neck. More than half, in 45 cases (67%), death occurred within 6 hours of the attack, out of which 32 deaths resulted from injuries inflicted over the neck and thoracoabdominal region with dangerous weapons and means. **Conclusion:** Patterns of injuries in homicidal death may be a helpful indicator, and law enforcement agencies and autopsy pathologist should do a detailed examination of injuries/wounds.

Keywords: Culpable homicide; head injury; sharp injuries.

Cite this article as: Sharma Deepak, Verma LC, Tiwari Pramod. A study on the pattern of injuries in homicidal deaths at MBS hospital associated with Government Medical College Kota, Rajasthan. *Int J Health Res Medico Leg Prae* 2021 Jan-Jun; 7(1):37-41. Doi: 10.31741/ijhrmlp.v7.i1.2021.6.

INTRODUCTION

Homicide is defined as the killing of one human being by another human being. Homicide is the most serious crime, as

old as civilisation, and it is one of the leading causes of unnatural death¹. Homicide is wilful killing that incorporates “mensrea”, the mental element of a person’s intention to commit a crime, and “actus reus”- actual execution or guilt.

The killing of an individual is the highest level of aggression in all cultures. Thus, homicide is not only the death of human being but also humanity.²

Day by day incidences of homicide is increasing due to changing lifestyle, unemployment, drug addiction and life stress. Investigation of homicide can never be complete without a meticulous autopsy examination. The pattern of homicidal deaths varies across different populations, across different regions and keeps changing with time due to change in societal trends and influences. The design of injuries in homicidal death may provide helpful information for law enforcement strategies. The role of the forensic expert is to help in the administration of justice. Medico-legal autopsies give the cause and manner of death and share necessary statistical data related to legal incidents in the cities and regions where the autopsies are conducted.

The detailed analysis and scientific interpretation of autopsy findings are imperative to reconstruct the crime scene. Autopsy surgeons not only help to conclude the cause of death of the victim by studying the dead body and co-relating with the circumstantial evidence but also help to complete the methods and means employed in these acts along with requisite detailing of the injuries inflicted, which plays a determinant role in framing charges in cases. Thus, helping the law to punish the person involved in committing the crime. Detailed examination of wounds helps in the prediction of the weapon used in the killing. The nature of the weapon used and the gravity of the injury inflicted together to play a decisive role in identifying the charges to be held against the accused, which further determine the punishment in each case.³

The Kota city is situated on the river bank, long railway track, connecting Delhi to Mumbai, and there is a dense jungle of Chambal also present. These all factors are favourable to commit a crime like homicide, and the numbers of homicidal deaths are more in the Kota region than in other parts of Rajasthan. This study's primary objectives were to analyse the information to determine the pattern of injuries in homicidal deaths in the Kota region.

MATERIAL AND METHODS

The present study was conducted in the department of forensic medicine and toxicology at MBS hospital Kota from Jan 2017 to Dec 2018 after taking permission from the research review board and ethical committee and completing all due formalities. Out of 2013 cases at autopsy, 71 cases of homicidal death were reported.

Inclusion criteria: All homicidal deaths as a result of mechanical injuries were included. Exclusion criteria: Homicidal deaths due to poisoning and burn were excluded.

In this study, 67 cases of homicidal deaths due to mechanical injuries were included. Detail information regarding crime circumstances was sought out from police/magistrate inquest, complete history, treatment record and post mortem examination.

RESULTS

In this two-year study, out of the 2013 total autopsied cases, 67(3.3%) cases of homicidal deaths due to mechanical injuries were included. Deaths due to poisoning and burn, two instances of each, were not included in this study (**Table 1**).

Table 1 Year-wise distribution of culpable homicide

Year	Total autopsy	Homicide	Poison	Burn	Mechanical injuries
2017	970	34	01	01	32
2018	1043	37	01	01	35
Total	2013	71	02	02	67

Head and face were observed as the most common body part targeted with 32(47.8%) deaths due to fatal injuries on these parts of the victims, followed by a thoracoabdominal region

Table 2 Frequency of homicide cases according to fatal injuries on body parts

Body part	No. of cases (%)
Head	32(47.8%)
Neck	06(8.9%)
Chest	13(19.4%)
Abdomen	14(20.9%)
Limbs	02(3.0%)

with 27(40.3%) cases and neck with 6(8.9%) cases. Fatal injuries in peripheral parts were observed only in 2(3.0%) cases (**Table 2**).

Abrasions were the least common fatal wounds on the head observed only in two cases. Two deaths of head injuries were observed due to fatal firearm injuries. Blunt weapons were used in most cases due to their easy availability and because most of the crime in our society was not very planned. Six deaths were observed due to injuries over the neck region, out of which four cases resulted from incised wounds and two deaths due to strangulation. Our study showed that 14 deaths resulted from fatal injuries in the abdominal region, and 13 deaths resulted from fatal chest injuries. Twenty-seven

deaths were observed due to fatal stab/incised wounds. Out of which, 25 homicidal deaths resulted from deadly injuries on the neck and thoracoabdominal region. Chest and abdominal area were the preferable site for sharp injuries, 21 cases followed

by neck cases. Deaths due to firearm injuries, out of which three fatal injuries on the abdominal region, two fatal injuries on the chest and head region (**Table 3**).

Table 3 Fatal injuries (wounds) on body parts.

Body part	Abrasions	Bruises	Lacerations	Stab/incised	Firearm	Total
Head	02	05	23	00	02	32
Neck	02(PON)	00	00	04	00	06
Chest	00	00	00	11	02	13
Abdomen	00	01	00	10	03	14
Limbs	00	00	00	02	00	02
Total	04	06	23	27	07	67

PON = *pressure over the neck*

Out of 32 cases of head injuries, 28 cases had bruise and laceration (by blunt weapons) as fatal injuries, out of which 23 cases (n=28) were having fractures of craniofacial bones. The most common bone to be fractured was the parietal bone,

followed by the frontal bone. In five cases, there was a fracture of more than one skull bones were observed. Fracture of the base of the skull was observed only in one case (**Table 4**).

Table 4 Pattern of fractures of skull bone (n=23)

Bone fracture	No of cases	Percentage
Frontal bone	05	21.7
Parietal bone	07	30.4
Temporal bone	03	13.3
Occipital bone	02	08.6
Base of skull	01	04.3
Multiple bones	05	21.7

Cranio-facial injuries were the most common cause of death in 32 cases, followed by haemorrhagic shock in 28 cases. Five deaths were due to complications of injuries, and two deaths were observed as a result of asphyxia.

This study showed that in more than half 45 cases (67%), death occurred within 6 hours of the attack, out of which 32 deaths (71%) were as a result of injuries inflicted over the neck and thoracoabdominal region with dangerous weapons and means, as shown in **Table 3 and 5**.

Table 5 Time of survival of victims of culpable homicide

Time of survival	Head	Neck	Chest	Abdomen	Limbs	Total
Spot death	06	06	13	08	01	34
0 – 6 hrs	08	00	00	03	00	11
6- 12 hrs	06	00	00	01	01	08
>12 hrs	12	00	00	02	00	14
Total	32	06	13	14	02	67

This analysis reflects that injuries were presented over vital body parts and were sufficient to cause death in the ordinary course of nature, thus constituting the crime of culpable homicide amounting to murder.

Our study showed that the brain was the most common vital organ involved in 32 deaths followed by abdominal organs in 14 cases, out of which liver involved in 05 cases, spleen in 02 cases, both liver and spleen in 03 cases, intestine in 03 cases and renal organs in 01 cases. Out of 13 fatal chest injuries, the heart and lungs involved in 08 cases, the lungs in 03 cases and the heart in 02 cases. Out of 06 deaths due to neck injuries, 04 cases involved carotid arteries and vein and 02 cases resulting from asphyxia.

In this study, defence wounds present in 14 cases (20.8%). The most typical defence wounds were incised wounds followed by bruises. Defence wounds present primarily on the upper limbs.

DISCUSSION

Various injuries in homicidal deaths included assault by a sharp weapon, blunt weapon, firearms weapon, strangulation, smothering, burn and poisoning. The incidence of homicide is increasing day by day in different parts of the country, and the pattern of injuries in homicidal deaths also keeps changing with time. Because of the escalating magnitude and frequency of such deaths and their negative impact on society, the present study was done to study the patterns of injuries in homicide.

This study was undertaken to analyse the pattern of injuries in culpable homicidal deaths, excluding deaths due to poisoning and burn. Total 71(3.5%) homicidal deaths were observed, out of which 67(3.3%) deaths resulted from mechanical forces. Findings of our study consist of various other Indian studies.²⁻⁴

The most common body part involved was head and face, 32 cases; these results consist of other studies.^{1,3,5} As the head is an essential part of the body, it is not a surprise that it is a fatal attack site. The common fatal injury observed was laceration, followed by incised/stab wounds. The findings consist of the study of Prashanth Mada et al.,⁶ and Sachin S. Sonawane et al.,⁷ and contrary to the study of Sandip Jhaveri et al.⁸

In stab/ incised injuries, the abdomen and chest were observed almost the same number of cases,^{10,11} respectively. Total 27 cases of fatal stab/ incised wounds were surveyed, out of which 21 deaths (n=27) due to fatal injuries over the thoracoabdominal region. Similar findings followed by Patel DJ5 and Murray et al.⁹

In our study, about 80% of victims (53 cases) died within 12 hours of infliction of injuries, out of which 45 victims died within 6 hours of infliction of injuries, and 34 (about 51%) victims died on the spot. Karthik S K et al.,¹⁰ also observed similar findings (56% spot deaths) in their study.

The most common cause of death was craniofacial injuries (47.8%). These findings consisted of the study of Prashanth Mada et al.,⁶ and contradicted the study of Parmar DJ et al.,² in which the most common cause of death was a shock due to stab injury.

In this study, defence wounds were present in 20.8% cases consistent with a survey of Parmar DJ et al.,² but contradicted the result of Patel DJ5 (35.4%) and Sonawane SS et al.,⁷ (42.4%).

CONCLUSION

Culpable homicide is the worst form of crime. The concerned bodies should take a firm step to control this heinous crime. A study of the pattern of injuries in homicidal death may be a valuable indicator for law enforcement agencies and autopsy pathologist. In this study, head and face were mainly attacked by blunt weapons, neck and thoracoabdominal region primarily targeted by sharp weapons. More than half of victims died within 6 hours of infliction of injuries. Defence wounds were present in about 21% of deaths.

Recommendations: Strict enforcement of law should have ensued on possession of sharp/firearm weapons. Medical persons should appropriately manage injuries in the vital region/vital organs. The pattern of injuries is suggestive of the manner of death, so a detailed examination of injuries/wounds should be done by an autopsy pathologist and investigating officer should work/coordinate with the autopsy pathologist in solving homicides.

Acknowledgements: The staff members of the department for their helping hand during the period of this study. Grateful acknowledgement to the family members for their consent to publish the result of this study.

Conflict of interest: None declared.

Source of funding: None declared.

Data Sharing Statement: All data are presented within the article.

Ethical clearance: Obtained from the 'Institutional Ethics Committee'.

Authors' Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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