

## Patterns of injuries in homicidal cases

## Padrões de lesões em casos de homicídios

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**ABSTRACT:** Death, an inevitable part of life, prompts an exploration into the manner and method by which it occurs. This study aims to analyze the patterns of injuries in homicidal cases brought for postmortem examination. In 2019, a total of 28,918 murder cases were registered in India, showing a slight decrease of 0.3% in comparison to 2018 (29,017 cases). The study aims to understand the different injury patterns in homicide. At the Department of Forensic Medicine, Gandhi Medical College, Bhopal, India, a total of 62 males and 12 females, along with one unknown gender person, were submitted to postmortem examination. The majority of cases belonged to urban, with leading causes of death being shock and hemorrhage followed by craniocerebral damage. This study concludes that sharp edges and deep cuts were the primary injury patterns in homicide cases.

**KEYWORDS:** Homicide; Injury; Injury Pattern; Postmortem.

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## Introduction

Among the three modes of death – accidental, suicidal, and homicidal – homicidal crimes stand out as prevalent issues in contemporary urbanized and industrialized societies<sup>1</sup>. Factors such as financial conflicts, infidelity, poverty, unemployment, stress, substance abuse, and easy access to weapons contribute to the rise in violent offenses. Violence reached an unprecedented scale in the twentieth century<sup>2</sup>. In India, one of the most prevalent forms of homicide is through injury with sharp-cutting or stabbing weapons<sup>4</sup>. This study delves into the type of injuries found in homicides, emphasizing the importance of such an investigation for determining whether a person died as a result of violence or from other causes<sup>5</sup>.

## Aims & Objective

- To evaluate the socio-demographic profile and pattern of injuries in homicide.
- To analyze groups of victims according to the type of homicide.
- To identify the motives behind homicidal deaths.
- To study the relation between types of injuries, types of weapons, location of injury, and number of injuries.
- To determine the survival period in homicidal deaths.

## Material and Methods

This descriptive cross-sectional study was conducted on homicidal death cases undergoing postmortem examination at the Department of Forensic Medicine, Gandhi Medical College, Bhopal. The study included all cases above 13 years of age. The patterns of injuries found were analyzed with reference demographic and socio-economic factors, medical history, and context of death. Information was provided by family members, the police, and the hospital.

## Observations and Results

The present study, conducted from Nov. 2019 to July 2020, included 75 homicide cases, identified from a total of 4731 autopsies performed in the period. The majority of homicide victims were male (83%), followed by female (16 %) and unidentified gender (1%), as seen in Figure 1.

The location of the fatal injury was found to be primarily in the neck (36%), followed by the head (32%) and abdomen (21.3%). Neck injuries included throttling. Single injuries were primarily on the neck (50%), followed by chest and abdomen, both corresponding to 20% of the cases. The highest occurrence of multiple injuries was associated with fatal injury on the head. The observed association between location of fatal injury and number of injuries was statistically insignificant ( $p > 0.05$ ).

**Table 1** - Location of fatal injuries and number of injuries

Location of fatal injury	Single injuries (n = 10)		Multiple injuries (n = 65)		Total (n = 75)	
	n	%	n	%	n	%
Head	1	10	23	35.4	24	32
Neck	5	50	22	33.8	27	36
Chest	2	20	14	21.5	16	21.3
Abdomen	2	20	4	6.2	6	8
Groin	0	0	2	3.1	2	2.7
$\chi^2$			4.78			
p-value			0.31			

Single injuries were associated with incised wounds in 30% of cases and with stab, abrasion, and penetrating wounds in 20% of cases each. Multiple injuries were mostly associated with abrasion and

contusion (35.4%), followed by stab wounds (24.6%). The present study documented a statistically significant association between type of injury and number of injuries ( $p < 0.01$ ).

**Table 2** – Association between type of injury and number of injuries

Type of injury	Single Injuries (n=10)		Multiple Injuries (n=65)		Total (n=75)	
	N	%	n	%	n	%
Abrasion	2	20	0	0	2	2.7
Contusion	0	0	1	1.5	1	1.3
Abrasion and contusion	0	0	23	35.4	23	30.7
Fracture	0	0	1	1.5	1	1.3
Hemorrhage/fracture	0	0	1	1.5	1	1.3
Incised wound	3	30	9	13.8	12	16
Incised with abrasion and contusion	0	0	2	3.1	2	2.7
Incised and contusion	0	0	4	6.2	4	5.3
Penetrating wounds	2	20	1	1.5	3	4
Stab	2	20	16	24.6	18	24
Stab and abrasion	1	10	0	0	1	1.3
Stab and incised	0	0	3	4.6	3	4
Stab and penetrating	0	0	2	3.1	2	2.7
Strangulation	0	0	1	1.5	1	1.3
Throttling and abrasion	0	0	1	1.5	1	1.3
$\chi^2$					34.4	
P value					0.002	

Single injuries were found to be primarily inflicted with a hard and sharp weapon (30%), followed by firearm and hard sharp, and penetrating weapon (each 20%). Multiple injuries were associated with hard and

blunt objects (29.2%), followed by Hard, sharp, and penetrating objects (27.7%). The observed association between number of injuries and type of weapon was statistically significant ( $p < 0.05$ ).

**Table 3** - Association between type of weapon and number of injuries

Type of weapon	Single injuries (n=10)		Multiple Injuries (n=65)		Total (n=75)	
	n	%	n	%	n	%
Firearm	2	20	1	1.5	3	4
Hard and blunt	1	10	19	29.2	20	26.7
Hard blunt, throttling And smothering	0	0	1	1.5	1	1.3
Hard, blunt and ligature	0	0	1	1.5	1	1.3
Hard and sharp	3	30	7	10.8	10	13.3
Hard sharp and hard blunt both	0	0	7	10.8	7	9.3
Hard heavy and blunt	0	0	6	9.2	6	8
Hard sharp and penetrating	2	20	18	27.7	20	26.7
Hard sharp and heavy	1	10	5	7.7	6	8
Ligature material	1	10	0	0	1	1.3
$\chi^2$					20.05	
P value					0.018	

Sudden death was observed in 10% of cases with single injuries and 10.8% of cases with multiple injuries. The survival period ranged between 1 to 12 hours and 13 to 24 hours in 20% and 30% of cases with single injuries, respectively. Similarly, the survival period

ranged between 1 to 12 hours in 24.6% and between 13 to 24 hours in 26.2% of cases. No statistically significant association between the number of injuries and the survival period ( $p>0.05$ ) was found.

**Table 4** - Association between number of injuries and survival period

Survival period	Single Injuries (n=10)		Multiple Injuries (n=65)		Total (n=75)	
	n	%	n	%	n	%
<b>Sudden</b>	1	10	7	10.8	8	10.7
<b>1-12hrs</b>	2	20	16	24.6	18	24
<b>13-24hrs</b>	3	30	17	26.2	20	26.7
<b>25-48hrs</b>	0	0	4	6.2	4	5.3
<b>48-72hrs</b>	1	10	5	7.7	6	8
<b>72 hrs to 1 week</b>	2	20	5	7.7	7	9.3
<b>&gt;1week</b>	0	0	3	4.6	3	4
<b>Unknown</b>	1	10	8	12.3	9	12
$\chi^2$			2.71			
<b>P value</b>			0.91			

The most frequent motive for the homicide was extramarital affair (14.66%), followed by drug addiction (12%), while the least common was mental illness (2.66%). Other causes included land disputes, robbery,

sudden provocation, old disputes, money disputes, and personal reasons. The motive remained unknown in 9.33% of cases.

**Table 5** - Distribution of homicide cases according to motive

Motive	Frequency(n=75)	Percent
<b>Love Affair</b>	11	14.66
<b>Drug addiction including Alcohol</b>	09	12
<b>Land Dispute</b>	08	10.66
<b>Robbery/Theft</b>	08	10.66
<b>Sudden Provocation</b>	08	10.66
<b>Old Enmity</b>	08	10.66
<b>Money Dispute</b>	07	9.33
<b>Personal Reason</b>	07	9.33
<b>Mental Illness</b>	02	2.661
<b>Unknown</b>	07	9.33

## Discussion

The examinations conducted were compared to the international literature with regard to sex, age, time of incidence, place of incidence, and motives used by the accused.

The incidence of homicides found in this study is 1.59% of all medico-legal autopsies. These results are lower than the global rate (6.9%) and the homicide rate of Asia (3%), Europe (4%), and America (16%). These findings are also lower than earlier observations made by Sheikh (2009)<sup>7</sup>, Prajapati et al. (2010)<sup>8</sup> and Hugar et al. (2010)<sup>9</sup>.

The present study supports the idea that homicidal crimes have recently decreased, correlating with the global trend. The 5:1 ratio found between males (75.23%) and females (24.13%) might be attributed to the aggressive nature of males, their greater exposure to the outside environment, indulgence in violent activities, and risk-taking behavior.

The lower incidence in females may be due to customs, social values, and the preference of females to stay indoors. Similar observations were made by Vougiouklakis & Tsiligianni (2006)<sup>10</sup>, Gupta et al. (2004)<sup>11</sup> and NCRB Records, Buchade & Mohite (2011)<sup>12</sup> where Male victims outnumbered female victims.

**Age Distribution** - The most affected age group was 21-40 years. This group was more vulnerable to homicides due to issues such as revenge, marital disputes, infidelity, dowry, gang rivalry, unemployment, and arguments. Similar findings were observed in other studies by Vij et al. (2010)<sup>13</sup> and Vougiouklakis & Tsiligianni (2006)<sup>10</sup>.

A large number of victims (60.34%) were also found to be young adults between 21-40 years of age, probably due to their aggressive nature and lead role in financial and property affairs. This also corresponds to the study done by Mohanty et al. (2005)<sup>14</sup> and Angam et al. (2018)<sup>5</sup> where the majority of victims were aged between 21 to 40 years. Kominato et al. (1997)<sup>15</sup> reported a contrasting result, with 46-55 years being the most commonly involved age group. The factors contributing to the highest incidence in the age group of 18-40

Years (64.63 %) were due to marital disputes, property disputes, unsuccessful romantic relationships, infidelity, dowry death in females, gang rivalry, unemployment, and heated arguments.

**Religions** – 74.7 % of victims were Hindu, 18.7% were Muslim, and the religion of 5.3 % was unknown (Table 3). Pathak & Sharma (2010)<sup>16</sup> and Mohanty et al. (2005)<sup>14</sup> Had similar findings. This could be attributed to the size of the Hindu population, compared to others.

**Occupation** - Most of the victims were daily wage workers, followed by retired individuals and farmers among males and housewives among females. This was consistent with other research by Mohanty et al. (2005)<sup>14</sup> and Kumar et al. (2005)<sup>17</sup>.

**Marital Status** - Most victims were married. This result is consistent with the trend of homicidal deaths at a tertiary care centers observed by Pathak & Sharma (2010)<sup>16</sup>.

**Socioeconomic Status** – Most cases belonged to middle followed by low Socioeconomic status. This may be related to desperation from unemployment. The low incidence of homicides in the upper-income group shows the monetary influence apart from emotional and environmental factors. Half of the homicidal incidents were in the lower socio-economic status, showing the influence of illiteracy, ineptness, insufficient income, inebriation, and indecency. Gadge et al. (2011)<sup>19</sup> and Gupta & Prajapati (2009)<sup>20</sup> have reached similar conclusions.

## Conclusion

The present research aims to advance the field of forensic medicine and criminal investigation. By systematically analyzing patterns of injuries in homicide cases, it offers crucial data that can be used to improve the understanding and resolution of violent crimes. Furthermore, it has the potential to inform preventive measures aimed at reducing the incidence of homicide, thereby contributing to a safer society. This study underscores the importance of postmortem examinations in solving homicide cases and highlights the indispensable role of forensic pathologists in the pursuit of justice.

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**RESUMO:** Morte, uma inevitável parte da vida, incita uma exploração a respeito da maneira e do método de sua ocorrência. Este estudo tem por objetivo analisar os padrões de lesões em casos de homicídios verificados em exames post-mortem. Em 2019, registrou-se um total de 28.918 casos de assassinato na Índia, mostrando um leve decréscimo de 0,3% em comparação com 2018 (29.017 casos). Este estudo objetiva entender os diferentes padrões de lesão em homicídios. No Departamento de Medicina Forense da *Gandhi Medical College*, em Bhopal, Índia, um total de 62 homens, 12 mulheres e uma pessoa de gênero não identificado, foram submetidas à análise post mortem. A maioria dos casos pertencia a áreas urbanas, com principal causa de morte sendo choque e hemorragia seguida de dano crânio cerebral. Este estudo concluiu que armas afiadas e cortes profundos foram os principais padrões de lesões em casos de homicídio.

**DESCRITORES:** Homicídio; Lesão; Padrão de lesão; Post-mortem.

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