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## Original Research Article

### Profile of Medico Legal Autopsies Conducted at a Tertiary Care Centre in Indore (M.P)

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Autopsy,  
Road Traffic Accident,  
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#### Abstract

**Introduction:** Death is defined as the irreversible cessation of all biological functions sustaining a living organism, resulting from natural or unnatural causes. Determining the cause of death is crucial for law enforcement and health professionals to understand mortality patterns. **Aim:** To determine the demographic profile and causes of death in autopsy cases brought to the Department of Forensic Medicine and Toxicology, MGM Medical College, Indore (M.P), over a one-year period (January 1, 2023, to December 31, 2023). **Methodology:** This retrospective study analysed autopsies performed from January 1, 2023, to December 31, 2023, at the Department of Forensic Medicine and Toxicology, MGM Medical College, Indore (Madhya Pradesh). **Results:** Out of 2778 cases brought for post-mortem examination, males predominated (2250, 81%). The majority (753, 27.1%) belonged to the 21-30 years age group. Road traffic accidents were the most common cause of death (1045, 37.6%). **Conclusion:** This study highlights the significance of determining the cause of death, particularly in cases of unnatural deaths. These results can inform preventive measures and policy decisions to reduce mortality rates, particularly among young males.

#### 1. Introduction

'Necropsy' is semantically the most accurate description of the investigative dissection of a dead body, the word 'autopsy' is used so extensively that there is now no ambiguity about its meaning.<sup>1</sup> In general terms, autopsies can be performed for two reasons: clinical interest and medico-legal purposes.

Theoretically any registered doctor can perform autopsy but ideally it should be performed by a forensic pathologist or forensic expert.<sup>2</sup>

Objective of doing autopsy is to find out cause of death, manner of death, how the injuries were caused, type of object involved and preservation of relevant organs as evidence.<sup>3</sup> In cases of new born infants the question of live birth and viability and live birth assumes importance and should be determined.<sup>4,5</sup> Manner of death is either natural or unnatural. Natural deaths are mainly due to pathological cause and Unnatural deaths could be Accidental, Suicidal and Homicidal.

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Unnatural deaths include road traffic accidents, railway accidents, mechanical asphyxia, drowning, accidental fire, electrocution, assaults, poisoning, firearms, fall from heights, killed by animals, illicit liquor, snake bites, and food poisoning.<sup>6</sup> Manner of death is usually deciphered by circumstantial evidences but the cause of death in most of the cases is determined by the autopsy finding.<sup>7,8,9,10,11</sup> According to NCRB 2022 data, During 2022, total of 4,46,768 cases of Road Accidents were reported which rendered 4,23,158 persons injured and 1,71,100 deaths. 45.5% victims of road accidents were riders of 'two wheelers' followed by cars, trucks / lorries and three wheeler/auto rickshaw have accounted for 14.1%, 8.8% and 4.5% respectively of road accidental deaths. Majority (62.6%) of road accidents were due to over speeding accounting for 1, 00,726 deaths and 2, 71,661 persons injured. Dangerous/careless driving or overtaking contributed to 24.7% road accidents which rendered 45,161 deaths and 1, 00,901 persons injured and 2.2% of road accidents were due to poor weather conditions. 59.7% and 40.3% of road accidents were reported in rural areas (2, 66,707 cases) and urban areas (1, 80,061 cases) respectively. 29.5% (1, 31,793 cases out of 4, 46,768 cases) of total road accidents were reported near residential areas. Most number of deaths were seen in Maharashtra (66656 cases) followed by Madhya Pradesh (43726 cases) and the least reported in Lakshadweep (8 cases) followed by Nagaland (55 cases).<sup>12</sup>

Total number of Road Accidents registered an increase by 11.9% in 2022 compared to the previous year 2021. The number of persons killed and the number of persons injured had also increased by 9.4% and 15.3% respectively in 2022 as compared to the year 2021.<sup>13</sup> The aim of our study is to analyse the cause of death, age, sex, month & religion wise distribution among 2778 cases taken in our study over a period of one year duration.

## 2. Material and methods

The present study is a retrospective study performed in the Department of Forensic Medicine and Toxicology at Medical College in Central India from January 2023 to December 2023 and a total no. of 2778 cases were analysed. Information regarding deceased age, sex, religion, incident duration (month wise) and cause of death were collected from the

department records, police Inquest papers and Post mortem reports. A Proforma has been formed to collect data, compiled the collected data on excel sheet, observed it and the results has been drawn.

## 3. Result

The present study is a retrospective study performed in the Department of Forensic Medicine and Toxicology at Medical College in Central India. A total of 2778 medico legal autopsies were conducted during the study period of 01 year from January 2023 to December 2023, out of which 2250 cases (81%) were males and 528 cases (19%) were females (**Table-1**).

Taking age group into consideration, the maximum number of male cases are 621 (22.3%) in the age group of 21-30 years, followed by 31-40 years age group with 501 cases (81.3%). In females, 21-30 years age group has maximum number of cases i.e. 132 (4.7%) followed by the 31-40 years age group with 115 cases (4.1%). The least number of cases in males are 57 (2.0%) belongs to the age group of >70 years and least number of female cases are 07 (0.2%) belong to the similar age group as male. Taking overall population into consideration 21-30 years age group has maximum number of cases i.e. 753(27.1%) and the least number of cases were 64 cases (2.3%) in the age group of >70 years (**Table-1**).

**Table 1. Age and Sex wise distribution of cases (n-2778).**

| Age          | Sex    | No. of cases (%) | Total cases (%) |
|--------------|--------|------------------|-----------------|
| 0-10         | Male   | 85(3.1)          | 115(4.1)        |
|              | Female | 30(1.0)          |                 |
| 11-20        | Male   | 243(8.7)         | 312(11.2)       |
|              | Female | 69(2.4)          |                 |
| 21-30        | Male   | 621(22.3)        | 753(27.1)       |
|              | Female | 132(4.7)         |                 |
| 31-40        | Male   | 501(18.0)        | 616(22.2)       |
|              | Female | 115(4.1)         |                 |
| 41-50        | Male   | 381(13.7)        | 445(16)         |
|              | Female | 64(2.3)          |                 |
| 51-60        | Male   | 237(8.5)         | 314(11.3)       |
|              | Female | 77(2.7)          |                 |
| 61-70        | Male   | 125(4.5)         | 159(5.7)        |
|              | Female | 34(1.2)          |                 |
| >70          | Male   | 57(2.0)          | 64(2.3)         |
|              | Female | 07(0.2)          |                 |
| <b>Total</b> |        | 2778             | 2778            |

On the basis of Month wise distribution of case in the present study, the maximum number of

autopsies was conducted in the month of March that is 276 cases (7.9%) followed by in month of May that is 270 cases (9.7%). Month of September showed least number of cases i.e. 186 (6.7%) (Table-2).

In the present study, Hindu deceased's were majority in number with 2334 cases (84.04%) followed by Muslims with 154 cases (5.5%) followed by Sikh with 93 cases (3.3%) and the least number of deceased were belongs to Jain community that is 7 cases (0.25%). In our study, unknown cases were 179 in number that is 6.4%.

In our study, out of 2778 cases, the cause of death was determined in 2163 cases (77.7%). Out of these 2163 cases, in 221 cases (10.1%) death was due to natural causes, whereas in 1942 cases (89.9%) it was

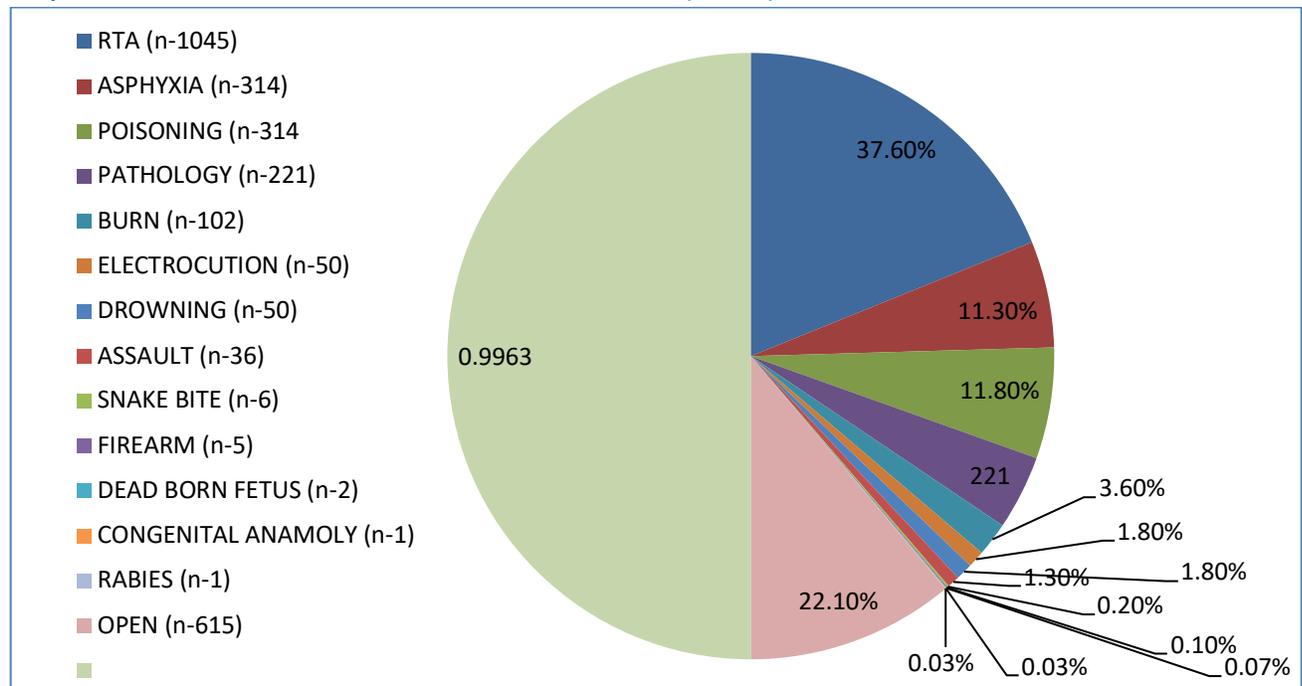
unnatural. In 615 cases (22.1%) cause of death could not be ascertained.

It was observed that death due to road traffic accident was most common cause of death involving 1045 cases (37.6%), followed by poisoning 330 cases (11.8%), followed by asphyxia 314 cases (11.3%) (In this study asphyxia includes death by hanging, smothering, strangulation and suffocation). Death due to pathological cause seen in 221 cases (7.9%) including cardiac pathology, lung pathology, liver pathology or brain pathology. Death due to burn seen in 102 cases (3.6%) including thermal burn and scald burn. Death due to electrocution and Drowning includes 50 cases (1.8%) each. Violent Death due to Assault seen in 36 cases (1.3%) including stab injury, blunt trauma to head, abdomen and other part of body.

Table 2. Month & Sex wise distribution of cases (n-2778)

| Gender      | Jan          | Feb          | Mar          | Apr          | May          | June         | Jul          | Aug          | Sept         | Oct          | Nov          | Dec          | Total          |
|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|
| Male        | 160          | 178          | 207          | 204          | 219          | 186          | 176          | 189          | 151          | 204          | 174          | 202          | 2250(81%)      |
| Female      | 49           | 41           | 69           | 30           | 51           | 39           | 45           | 45           | 35           | 29           | 44           | 51           | 528(19%)       |
| Total cases | 209<br>(7.4) | 219<br>(7.8) | 276<br>(7.9) | 234<br>(8.4) | 270<br>(9.7) | 225<br>(8.1) | 221<br>(7.9) | 234<br>(8.4) | 186<br>(6.7) | 233<br>(8.3) | 218<br>(7.8) | 253<br>(9.1) | 2778<br>(100%) |

Graph 1 - Distribution of cases on the basis of cause of death (n-2778)



In our study, there were also 06 cases (0.2%) cases of death due to snakebite and 05 cases (0.1%) of death due to firearm injury. In our study, we also found rare cause of death i.e. rabies and congenital anomaly including 01 case each. (Table-3) (Graph 1).

In males major cause of death was road traffic accident 901 cases (32.4%) followed by asphyxia 240 cases (8.6%) and in female major cause of death was 144 cases (5.1%) followed by poisoning 100 cases (3.5%). Least common cause of death in males was

rabies with 01 case (0.03%) and in females the least common cause of death was snake bite having 02 cases (0.06%) .

**Table 3. Distribution of Cases on the bases of Cause of Death (n-2778).**

| Cause of Death     | No. of Male        | No. of Female     | Total (%)   |
|--------------------|--------------------|-------------------|-------------|
| RTA                | 901(32.4)          | 144(5.1)          | 1045(37.6)  |
| Poisoning          | 230(8.2)           | 100(3.5)          | 330(11.8)   |
| Asphyxia           | 240(8.6)           | 74(2.6)           | 314(11.3)   |
| Pathology          | 184(6.6)           | 37(1.33)          | 221(7.9)    |
| Burn               | 60(2.15)           | 42(1.5)           | 102(3.6)    |
| Electrocution      | 34(1.2)            | 16(0.5)           | 50(1.8)     |
| Drowning           | 27(0.9)            | 23(0.8)           | 50(1.8)     |
| Assault            | 27(0.9)            | 09(0.3)           | 36(1.3)     |
| Snake Bite         | 04(0.1)            | 02(0.07)          | 6(0.2)      |
| Firearm            | 05(0.1)            | 00                | 5(0.1)      |
| Dead Born Fetus    | 02(0.07)           | 00                | 2(0.07)     |
| Congenital Anomaly | 01(0.03)           | 00                | 1(0.03)     |
| Rabies             | 01(0.03)           | 00                | 1(0.03)     |
| Open               | 534(19.2)          | 81(2.9)           | 615(22.1)   |
| <b>Total</b>       | <b>2250 (81.0)</b> | <b>528 (19.0)</b> | <b>2778</b> |

(RTA- Road Traffic Accident).

#### 4. Discussion

During the study period of one year, a total of 2778 cases of medico legal autopsies were performed at Department of Forensic Medicine and Toxicology. Out of 2778 cases 2250 (81%) were males and 528 (19%) were females showing male predominance and this finding of male predominance was consistent with studies done by Jain.A.P et al<sup>14</sup> in which out of 2447 cases, maximum number were of Male cases that is 1826 (74.6%) predominated over the female cases. This similar findings is also consistent with study done by Venkatesulu B<sup>6</sup> et al, Narendra Singh et al<sup>15</sup> and Pramod kumar et al.<sup>16</sup> Male predominance can be explained by males being more exposed to the external environment than females because of their more involvement in many sectors like in Government or private services, in sports, in army etc. In our present study, The most common age group involved in both male and female was 21-30 years having 753 cases (27.1%), this finding is consistent with the study conducted by Venkatesulu B<sup>6</sup> et al, Jain.A.P et al<sup>14</sup>, Narendra Singh et al<sup>15</sup> and Pramod Kumar et al<sup>16</sup> in which 21-30 years of age group involves 458 (34.2%), 690 cases (28.2%), 119 cases (36.06%) and 260 cases (32.1%) respectively. This age

group of 21-30 years belong to young adults who are active, energetic, mobile and impetuous which results in violence and wrong doing.

In our study population, 2334 cases (84.04%) were of Hindus followed by 154 cases (5.5%) were Muslims. Similar findings were observed by Venkatesulu B<sup>6</sup> et al, in which 1257 cases (67.69%) were Hindus followed by 419 cases (22.56%) were Muslims and in study done by M.E. Bansude et al<sup>17</sup> in which 630 cases (87.26%) were Hindus followed by 92 cases (12.74%) were Muslims. In contrast to our study, Gurmanjit Rai Mann et al<sup>18</sup> study shows common population involved were also belong to hindu religion that is 660 cases (83.22 %) but second most common was Sikh 83(10.48%). Hindu being predominant because in India majority of population were of Hindus. In our study, Religion was not known in 179 cases (6.4) as their identity is not known.

In the present study the maximum number of deaths were due to road traffic accident seen in 1045 cases (37.6%), followed by poisoning 330 cases (11.8%) and asphyxia 314 cases (11.3%) etc, similarly in the study conducted by Venkatesulu B<sup>6</sup> et al death due to road traffic accident was most common cause of death account for 45.07% followed by poisoning that is 15.67%. Similar finding of most common cause of death being road traffic accident followed by poisoning were observed in study conducted by Narendra Singh et al<sup>15</sup> in which death due to road traffic accident were present in 142 cases (43%) followed by poisoning in 98 cases (29.69%) and Pramod kumar et al<sup>16</sup> in which death due to road traffic accident were present in 313 cases (38.6%) followed by poisoning in 140 cases (17.2%). In study conducted by Jain A.P. et al.<sup>14</sup> The major cause of death was same as our study that is road traffic accident seen in 42.5% but second most common was differ from our study that is Pathological death seen in 16.5 % of cases. In study conducted by M.E. Bansude et al<sup>17</sup> also major cause of death was road traffic accident seen in 246(34.07%) cases and second most common was differ from our study that is thermal injuries in 193(26.73%) cases. Road traffic accident is major cause of death due to non-

adherence and unawareness of traffic rules, violating traffic rules, over speeding, poor condition of roads and overcrowding etc.

This finding of road traffic accident being most common cause of death in our study was found inconsistent with the study done by Mitra S. et al<sup>19</sup> who found death due to poisoning as a major cause of death in 36.6% cases followed by burn in 24.8% cases. In a study by Bhoi et al<sup>20</sup> poisoning deaths are observed more in young age group. Infant deaths are less.<sup>21</sup> There are very less number of assault cases as compare to other region.<sup>22</sup> Also in study conducted by Mugadlimath A. et al<sup>23</sup> major cause of death was burn seen in 37.5% cases followed by road traffic accident in 22% cases. This inconsistency in cause of death is may be due to different geographical area and less traffic movement in that area.

## 5. Conclusion

This study helps to understand pattern of medico legal autopsy conducted at the mortuary of Medical College in Central India. Road traffic accident was the most common cause of death in either gender of age group 21-30 years. In females second most common cause of death was poisoning whereas in males it was Hanging (Asphyxia). Accidental deaths can be prevented by encouraging people about use of helmets and seat belt, strict implementation of traffic rules and awareness about road safety measures. In today's world of artificial intelligence we should adopt GPS system and alarming system in all the vehicles which during the time of accident should alarm the nearest police station and hospitals resulting in timely hospitalization and early management which will reduce accident related mortality.

Since suicide is conglomerate, there is a need to spread awareness among people including children's, parents and young adults about mental health, communication and importance of meditation. Homicidal deaths can be reduced by increasing literacy rate, job opportunity and strict implementation of law and order.

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**Contributor ship of Author:** All authors equally contributed.

**Conflict of interest:** None to declare.

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