

A Profile of Medicolegal Autopsy Cases at the Mortuary of A Tertiary Care Hospital in Ambala, Haryana

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Abstract

Background: Autopsies are critical in determining the cause and manner of death, providing valuable insights into mortality patterns, and forming public health strategies.

Aims & Objectives: This study aims to determine the socio-demographic profile of the autopsy cases and compare the different autopsy cases conducted in a tertiary care hospital in rural Haryana to identify prevalent causes of death and highlight areas for public health intervention.

Methodology: This is a prospective observational study include 200 autopsy cases conducted in the mortuary at a tertiary care hospital in Ambala, Haryana from March 1, 2023, to April 30, 2024. Data were collected from the postmortem examination findings and police inquests, and descriptive statistics were analyzed.

Results: Of the 200 autopsy cases, majority, 170 (85%) were males. Most of the autopsies, 103 (51.5%) cases, were in the 21-40 years age group, followed by 54 (27%) cases in 41-60 years. Urban domicile constituted 125 (62.5%) of cases, indicating a higher prevalence of mortality events among individuals residing in urban areas. The majority 163 (81.5%) cases, were individuals of the Hindu faith. The most common cause of death was due to RTAs (105 cases, 52.5%), which resulted in head injuries, multiple mechanical injuries, hemorrhagic shock, etc., followed by poisoning, which constituted 53 (26.5%) of cases. Most of the autopsy cases were of accidental deaths, 120 (60.0%), followed by suicide, 65 (32.5%).

Conclusion: The study highlights the urgent need for targeted public health interventions to address the high incidence of RTAs and poisoning in Haryana.

Keyword: Medicolegal Autopsy; Road traffic accidents; Poisoning; Manner of death; Accidental deaths.

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INTRODUCTION

Autopsy implies seeing with one's own eyes (autos = self, opis = gaze). The correct phrase for the investigative dissection of a corpse is necropsy (necros = dead, opis = view). However, autopsy is more widely used and more popular. Another name is postmortem (post = after, mortem = death) examination, although this term lacks clarity regarding the scope of the examination.¹ If a body's identity is unknown, the goal of a medicolegal postmortem examination is to determine the identity of the deceased, the cause of death, the time since death, whether the death was natural or not,



and if it was not natural, whether it was the result of suicide, homicide, or accident. In cases involving infants, determining live birth and viability is crucial. A complete autopsy involves examining all body cavities and organs in the head, thorax, and abdomen.²

The issues of live birth and viability are significant and need to be decided in the case of newborns.² Autopsies are critical in determining the cause and manner of death, providing valuable insights into mortality patterns and forming public health strategies.¹ In rural areas, where healthcare disparities and limited access to medical facilities often resulted in under reported and misunderstood causes of death, understanding these patterns was crucial.² There were two primary types of autopsies: medicolegal, clinical, and hospital. Medicolegal autopsies are conducted in cases of unnatural deaths such as homicidal, accidental, and suicidal or where any foul play is suspected. In such examinations, authorization of the police or magistrate is required to conduct the postmortem examination. Categories of autopsies include asphyxial deaths such as hanging, strangulation, suffocation, and drowning, cases of thermal injury deaths due to both cold and heat, electrocution, lightning, fatalities due to mechanical forces such as road traffic accidents (RTAs), falls from height, cases of fatal poisonings, etc. Clinical or hospital autopsies are performed to understand better the causes of death in hospital settings after obtaining consent from deceased relatives.³

Medicolegal autopsies, or forensic autopsies, were particularly significant as they were conducted under state law to aid in identifying and prosecuting individuals responsible for any unnatural deaths.⁴ This study aims to determine the socio-demographic profile of the autopsy cases and compare the different autopsy cases conducted in a tertiary care hospital in rural Haryana to identify prevalent causes of death and highlight areas for public health intervention.

MATERIALS AND METHODS

This study employed a prospective observational design. The study includes all autopsy cases conducted in the mortuary of the Department of Forensic Medicine and Toxicology, Maharishi Markandeshwar Institute of Medical Sciences and Research (MMIMSR), Mullana, Ambala, Haryana, from March 1, 2023, to April 30, 2024. The present study includes 200 such medicolegal autopsies conducted during the study period. Prior approval from the institutional ethics committee was obtained for conducting the study (IEC-2596/MMIMSR). Data such as age, sex, religion, domicile, occupation, and cause of death were collected from

postmortem reports, police inquest, histopathology reports, and chemical analysis of the viscera report. All the above information was compiled using an anonymized predesigned data collection proforma. The obtained data were tabulated in Microsoft Excel and analyzed using a descriptive statistical method using IBM SPSS software.

RESULTS

The data showed a significant disparity in the sex distribution of autopsy cases, with males constituting a substantial majority (85%) of the cases. Of 200 autopsy cases, 170 (85%) were males, and 30 (15%) were females. Most of the medicolegal autopsies, 103 (51.5%) cases, were in the 21-40 years age group, followed by 54 (27%) cases in 41-60 years. This highlights a significant mortality burden among the young and middle-aged population (Fig. 1).

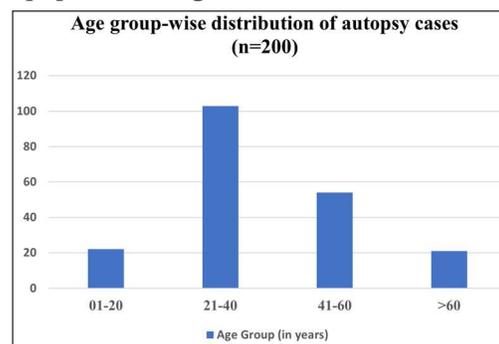


Fig. 1: Shows age group-wise distribution of autopsy cases.

Among the 200 autopsy cases, there is a notable contrast in the distribution of cases between rural and urban residents. Urban residents constituted 125 (62.5%) of cases, indicating a higher prevalence of mortality events among individuals residing in urban areas. Rural residents accounted for 75 (37.5%) cases, representing a comparatively lower proportion of mortality events within the rural Haryana community during the specified period (Fig. 2).

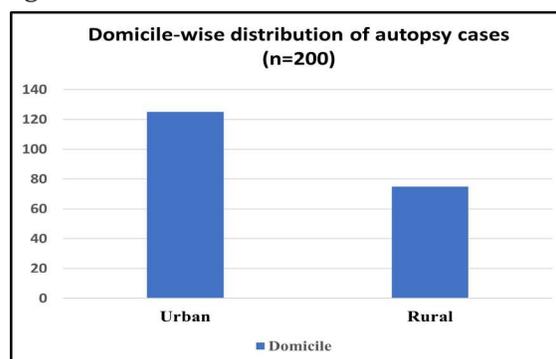


Fig. 2: Shows age group-wise distribution of autopsy cases.

The majority of autopsy cases, comprising 163 (81.5%) cases, were individuals of the Hindu faith. This dominance underscores the predominant prevalence of Hinduism among individuals undergoing autopsies within the study population during the specified period. Sikh individuals constitute the next significant religious group, representing 15.0% of the cases. This suggests a notable presence of individuals belonging to the Sikh faith among those affected by mortality events, reflecting the religious diversity within the rural Haryana population. Individuals of the Muslim faith comprise a smaller proportion, accounting for 3.0% of the cases. While this group contributes less to the overall caseload, its inclusion underscores the religious heterogeneity among individuals undergoing autopsies (Table 1).

Table 1: Shows the religion-wise distribution of autopsy cases

Religion (n=200)	n (%)
Hindu	163 (81.5%)
Sikh	30 (15.0%)
Muslim	06 (03.0%)
Christian	01 (00.5%)

The most common cause of death was due to RTAs (105 cases, 52.5%) which involved head injuries, multiple mechanical injuries, hemorrhagic shock, etc., followed by poisoning (53 cases, 26.5%),

asphyxia (15 cases, 7.5%), natural causes (10 cases, 5%), falls from height (5 cases, 2.5%), electrocution (4 cases, 2.0%), and burns (3 cases, 1.5%). There was a case of death due to homicidal firearm injury. These findings indicated a high prevalence of accidental and intentional injuries within the study population (Table 2).

Table 2: Shows the distribution of causes of death among the autopsy cases

Cause Of Death (n=200)	n (%)
Road Traffic Accident	105 (52.5%)
Poisoning	53 (26.5%)
Asphyxia	15 (07.5%)
Natural Causes	10 (05.0%)
Falls from Height	05 (02.5%)
Assault	04 (02.0%)
Electrocution	04 (02.0%)
Burns	03 (01.5%)
Firearm	01 (00.5%)

Both RTAs and poisoning were more prevalent in the 21-40 years age group. Asphyxial deaths and death due to natural causes were more evenly distributed but showed higher incidence in the 41-60 years age group (Table 3).

Table 3: Shows the distribution of different age groups and the causes of death

Causes Of Death Age Group (Years)	Road Traffic Accidents	Poisoning	Asphyxia	Natural Causes	Other Causes*	Total
01-20	10	8	2	1	1	22
21-40	60	28	5	3	3	103
41-60	25	10	5	5	9	54
>60	10	7	3	1	0	21
Total	105	53	15	10	13	200

Table 4: Shows the distribution of manner of death among the autopsy cases

Manner Of Death (N=200)	n (%)
Accident	120 (60.0%)
Suicide	65 (32.5%)
Natural	10 (5.0%)
Homicide	05 (2.5%)

Most of the autopsy cases were of accidental deaths, 120 (60.0%), followed by suicide 65 (32.5%) cases. Homicide cases were least in number 5 (2.5%) (Table 4).

DISCUSSION

The present study revealed a significant incidence of RTAs as the leading cause of death among autopsy cases in Haryana. This high prevalence of RTAs, underscores the need for improved safety

measures and emergency response systems.⁵ The substantial proportion of deaths due to poisoning, primarily from agricultural chemicals, indicated a serious public health issue in rural Haryana. The high incidence of poisoning aligned with findings from other regions with extensive agricultural activities, where pesticide exposure was a major risk factor.^{6,7}

The gender disparity in the present study, with males constituting 85% of the autopsy cases, was consistent with other studies that reported higher male mortality due to greater exposure to risk factors such as occupational hazards and risky behaviors.^{8,9}

The age distribution data showed that the 21-40 years age group was the most affected, accounting for over half of the autopsy cases. Studies such as those by Crimmins et al. highlight similar trends, attributing higher male mortality to greater exposure to risk factors such as occupational hazards and risky behaviors. Also, the predominance of the 21-40 years age group in mortality is consistent with findings from Wang et al. which emphasize that this age group is more engaged in high-risk occupations and activities.^{10,11} This critical finding highlighted the loss of life in the most productive years, impacting the community and the economy. Preventive measures targeting this age group, such as workplace safety programs and health education, were essential to mitigate these risks. Additionally, the lower mortality in younger (1-20 years, 11%) and older (>60 years, 10.5%) age groups reflect natural differences in exposure to high-risk activities in these populations. These results indicate a need for targeted interventions to address these risks, particularly in male-dominated occupations.

With the residential area, the higher prevalence of mortality among urban 45 residents (62.5%) compared to rural residents (37.5%) is consistent with findings from Jaglan et al., which suggest that urban areas may have better reporting and healthcare access but also higher risk exposures such as traffic accidents and pollution.¹² In the occupational profile, the significant representation of farmers (47.5%) and private sector employees (46%) in mortality data reflects findings from Molina et al.¹³ Among religion-wise distribution, Hindus (81.5%) being the majority, followed by Sikhs (15%) and Muslims (3%), reflects the regional demographic composition, similar to findings in studies by Singh et al.¹⁴

In the present study, the leading cause of death was RTAs, followed by poisoning, which aligns with

findings from Mohan et al., which emphasize the impact of road traffic accidents and occupational injuries on mortality. Studies on toxicological risks in rural settings also support the high prevalence of poisoning. The high prevalence of multiple injuries and head injuries among mechanical injury cases is consistent with findings by Mohan et al., which identify similar patterns of severe trauma due to accidents and assaults.¹⁵ Cardiovascular diseases (60%) being the predominant natural cause of death aligns with global patterns reported by Roth et al., emphasizing the significant impact of heart disease on mortality.¹⁶ The majority of the medicolegal autopsy cases in the present study were accidental deaths. The studies by Kumar et al. and Junaidi et al. on the profile of autopsy cases showed similar findings.^{17,18}

CONCLUSION

The study highlighted the urgent need for targeted public health interventions to address the high incidence of RTAs and poisoning in Haryana. Addressing the high incidence of mechanical injuries requires a multifaceted approach. Improving road safety through better infrastructure, strict enforcement of traffic laws, and public awareness campaigns could significantly reduce fatalities from road traffic accidents. The present study underscores the need for stricter regulations on pesticide use, better education on safe handling practices, and improved access to medical care for poisoning cases. This includes educating farmers and agricultural workers on the safe handling and storage of pesticides, promoting the use of less toxic alternatives, and ensuring timely medical intervention in cases of poisoning. Establishing poison control centers and training healthcare professionals on managing poisoning cases could also improve outcomes. Similarly, safety regulations and public education could help prevent deaths from electrocution and burns. The study's findings on asphyxial deaths highlighted the need for mental health support and intervention. Suicide prevention programs, mental health awareness campaigns, and easy access to mental health services could help address the underlying issues leading to such deaths. The findings provided valuable insights for healthcare planning and policy development to improve health outcomes in rural communities.

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Conflict of interest

The authors have no conflict of interest to declare.

Ethical Approval

The ethical approval for the study was obtained from the Institutional Ethics Committee, Maharishi

Markandeshwar Institute of Medical Sciences and Research (MMIMSR), Mullana, Ambala, Haryana (IEC-2596/MMIMSR).

Authors Contributions

All authors have contributed equally to the study and approved the final draft of the manuscript.

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