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Original Research Article

An epidemiological retrospective profile of medico-legal autopsy cases reported at a tertiary care center in Dhulikhel, Nepal

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ABSTRACT

Autopsy is a systematic scientific examination of dead body that helps in manifesting the information about the cause of death in case of an unnatural death. Medico legal autopsy profiling helps to understand the nature of casualties, it helps to assess the social and economic profile for understanding the nature of crime in particular area, helps to address the demographic needs according to the mortality statistics specific to that region and helpful to identify the need necessary to take preventive measures to stop the crime or unnatural deaths by means of spreading awareness and psychological course. This study aims to analyses the pattern of autopsy cases with manner and various causes of death which was conducted in a tertiary level hospital. This is a retrospective study conducted over a period of one year (Oct 2020 to Oct 2021) at Dhulikhel hospital, Nepal. During the study period on one year, a total of 258 cases of medicolegal autopsies were performed at Department of Forensic Medicine and Toxicology. Out of the 258 cases analyzed maximum incidence of the postmortems were reported in the age group of 43.80% was reported from 20 to 39 years aged group which are the most productive years in one's life. The maximum incidence of the postmortems was reported in the male population of 70.54% compared to the female population (29.46%). Our strongest conclusion is that male/female differences in medicolegal autopsies are highly dependent on historical time and geographic location. The maximum incidence 32.56% was reported within 6 – 12 hours' time group and minimum incidence 12.02% was reported within 0 – 6 hours' time group. The maximum incidence 48.06% was reported from Suicide group and minimum incidence 6.20% was reported from Homicide group. The maximum incidence 33.72% was reported by Hanging group and minimum incidence 0.39% were reported from Choking and Traumatic Asphyxia groups during the medicolegal autopsies¹⁻⁶

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1. Introduction

The profile of medico-legal autopsy cases is important to determine the death statistics in a particular region due to emerging causes and also helps to address the demographic needs according to the mortality statistics specific to that region. Autopsy means to see for oneself. The objective of medical legal post-mortem examination is to establish the

identity of a body when not known to ascertain the time since death and the cause of death; and whether that the death was natural or unnatural, and if unnatural whether it was homicidal, suicidal, or accidentally. Basically, a post-mortem examination means only when the body was examined after death and that the physician merely looked at the body fully clothed, or that he viewed the body at a Funeral Home, or in a mortgace. A complete autopsy involves opening of all the body cavities in all organs of

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the trunk, chest, and head. In most cases, it is complete and not a partial examination is more necessary on account of the imperfective evidence of the preliminary examination to assess the possible cause of death.

2. Materials and Methods

2.1. Study design

This study is a Retrospective, epidemiological, single center, experimental study.

2.2. Participants/ study population

Participants include corpses who present to Department of Forensic Medicine and Toxicology, Dhulikhel Hospital for post-mortem examination. The sample size is anticipated to be 258 subjects of either gender; however, the sample size would be altered based on the number of cases reported per year.

2.3. Rationale of the study

This study aims to report the demographical and epidemiological statistics of the autopsies reported and conducted in a tertiary care center in the department of Forensic Medicine and Toxicology, Dhulikhel hospital, Nepal.

2.4. Objectives of the research

2.4.1. Primary objective (s)

The primary objective of this study is to anticipate the epidemiological retrospective profile of medico-legal autopsy cases reported at a tertiary care center in Dhulikhel, Nepal

2.4.2. Secondary objective (s)

1. To assess the demographic statistics pertaining to age and gender in the autopsies reported and performed.
2. To assess the statistics of cause of death, type, and manner of death in the autopsies reported and performed.
3. To assess the statistics of time of death, and profile in the autopsies reported and performed.
4. To provide Thanatology aspects in the autopsies reported and performed per year in a tertiary care center.

2.5. Methods/ methodology

2.5.1. Study design

This study is a Retrospective, epidemiological, single center, experimental study.

2.5.2. Participants/ study population

Participants include corpses who present to Department of Forensic Medicine and Toxicology, Dhulikhel Hospital for post-mortem examination. The sample size is anticipated to be 258 subjects of either gender reported per year.

2.6. Selection criteria

2.6.1. Inclusion criteria

1. Corpses who will undergo post-mortem examination is included in the study
2. Manner of death is suggestive for autopsies due to suspicion

2.6.2. Exclusion criteria

1. Corpses with deformed or malformed body and with congenital abnormalities during the death
2. Non-suspicious manner of death without needs for postmortem examination

2.7. Study site and justification

Study is conducted at Department of Forensic Medicine and Toxicology, Dhulikhel Hospital. Dhulikhel Hospital is a Community Hospital with an occupancy history for the investigators to support the data that the mechanisms and forensic aspects of death, such as bodily changes that accompany death and the postmortem period can be easily collected.

2.8. Sampling method/ technique

Random sample allocation of the corpses based on the occurrence and reporting per time. The sampling is conducted over a period of one year.

2.9. Sample size determination

The minimum sample size (n) to estimate the true population proportion with the required margin of error (5%) and confidence level (95%) is determined to be 258 with sample proportion of 50%. This sample size calculation uses the Normal approximation to the Binomial distribution.

2.10. Data collection tools/ measures

Data is collected and processed at Department of Forensic Medicine and Toxicology, Dhulikhel Hospital. The data is collected as per the pre-defined Proforma and recorded accordingly.

2.11. Procedure

The study is conducted in 258 corpses reporting for postmortem analysis over a period of one year above 18 years of age presenting to the Department of Forensic Medicine and Toxicology, Dhulikhel Hospital. The corpses

are randomly selected and is assessed for the statistics regarding the epidemiology based on the autopsies performed. The Autopsy reports are anonymized with the patient code number, and sex, time of death, manner of death, pattern of death and cause of death data is documented. All the data is documented in the Proforma during the study.

2.12. The following criteria is analyzed during the analysis

1. Demographic Distribution
2. Intra-variables within the Pattern of Death
3. Intra-variables within the Manner of Death
4. Intra-variables within the Cause of Death

2.13. Future contact with the participants

No further contact with participants would be conducted post data completion.

2.14. Plan for data analysis

Software that is used for data analysis:

The data is analyzed using SPSS Statistics for Windows software package (Version 1.0.0.1406, IBM® SPSS® Statistics 21).

2.15. Statistical tests

Descriptive statistics with percentile strengths is calculated.

2.16. Limitations of the study (if any)

1. The study is conducted in single center with small sample size
2. All collections used in these studies are from different populations, and we cannot assume the methodology would yield equally high success rates in all groups

2.17. Significance of the study

The medico-legal autopsy profiling emphasis to understand the nature of the causalities in aspects of the Thanatology. It provides assessment of the social and economic profiling required to understand nature of crime in a particular area. This study helps to identify the epidemiological statistics of the medico-legal cases per unit time in a tertiary care Community Hospital. Therefore, this study would provide epidemiological profile of the medico legal autopsies profiling in the Nepalese population which would help forensic experts and epidemiologists in clinical survey.

2.18. Plan for supervision and monitoring

The data collected is reviewed and monitored by the Principal Investigator before being analyzed.

2.19. Plan for data management

The data is collected using pre-designed Proforma from the postmortem registers/ records during the study. All the collected and recorded data is kept secured in the Department of Forensic Medicine and Toxicology, Dhulikhel Hospital and confidentiality is maintained for the in quested documents.

2.20. Plan for dissemination of the research

We are publishing the research findings in the journal so that it can be a help in the field of Forensic Science and Epidemiology.

3. Results

From Table 1, Out of the total 258 cases the maximum incidence 43.80% was reported from 20 to 39 years aged group and minimum incidence 1.94% from 80 to 99 years aged group.

Table 1: Distribution of cases based on age

Age (in years)	No. of cases	Percentage (%)
0 to 19	29	11.24
20 to 39	113	43.80
40 to 59	78	30.23
60 to 79	33	12.79
80 to 99	5	1.94
Total	258	100.00

From Table 2, Out of the total 258 cases the maximum incidence 70.54% was reported from Male population and incidence of 29.46% from Female population.

Table 2: Distribution of cases based on gender

Gender	No. of cases	Percentage (%)
Male	182	70.54
Female	76	29.46
Total	258	100.00

From Table 3, Out of the total 258 cases the maximum incidence 32.56% was reported within 6 – 12 hours' time group and minimum incidence 12.02% was reported within 0 – 6 hours' time group.

Table 3: Distribution of cases based on time of death

Time (in hours)	No. of cases	Percentage (%)
0 – 6	31	12.02
6 – 12	84	32.56
12 – 18	82	31.78
18 – 24	61	23.64
Total	258	100.00

From Table 4, Out of the total 258 cases the maximum incidence 48.06% was reported from Suicide group and minimum incidence 6.20% was reported from Homicide group.

Table 4: Distribution of cases based on manner of death

Type/ Manner	No. of cases	Percentage (%)
Suicide	124	48.06
Homicide	16	6.20
Accident	94	36.43
Sudden Death	24	9.30
Total	258	100.00

From Table 5, Out of the total 258 cases the maximum incidence 33.72% was reported by Hanging group and minimum incidence 0.39% were reported from Choking and Traumatic Asphyxia groups.

Table 5: Distribution of cases based on cause of death

Cause	No. of cases	Percentage (%)
Hanging	87	33.72
Poisoning	40	15.50
Head Injury	48	18.60
Drowning	19	7.36
Hypovolemic Shock	28	10.85
Strangulation	2	0.78
Choking	1	0.39
Burns	2	0.78
Electrocution	3	1.16
Traumatic Asphyxia	1	0.39
Undetermined	10	3.88
Senescence/ Natural death	17	6.59
Total	258	100.00

4. Discussion

During the study period on one year, a total of 258 cases of medicolegal autopsies were performed at Department of Forensic Medicine and Toxicology. Out of the 258 cases analyzed maximum incidence of the postmortems were reported in the age group of 43.80% was reported from 20 to 39 years aged group which are the most productive years in one's life and the minimum incidence 1.94% was reported from 80 to 99 years aged group. The end points found from this study were consistent with findings of bibliography.^{1,2,5–10}

Out of the 258 cases analyzed maximum incidence of the postmortems were reported in the male population of 70.54% compared to the female population (29.46%). The end points found from this study were consistent

with findings of bibliography.^{1,2,4,5,9,11} The reason being men have more lethal conditions, whereas women have more disabling chronic conditions. Men and women have somewhat different psychological health problems; one gender cannot be characterized as having better psychological health hence the postmortem rate is low. Our strongest conclusion is that male/female differences in medicolegal autopsies are highly dependent on historical time and geographic location.

Out of the total 258 cases studied the maximum incidence 32.56% was reported within 6 – 12 hours' time group and minimum incidence 12.02% was reported within 0 – 6 hours' time group.

Out of the total 258 cases studied the maximum incidence 48.06% was reported from Suicide group and minimum incidence 6.20% was reported from Homicide group. The end points found from this study were consistent with findings of bibliography.^{1,2,4,7,11,12}

Out of the total 258 cases studied the maximum incidence 33.72% was reported by Hanging group and minimum incidence 0.39% were reported from Choking and Traumatic Asphyxia groups. The end points found from this study were consistent with findings of bibliography.^{1,2,4–6}

5. Conclusion

The study is conducted in 258 corpses reporting for postmortem analysis over a period of one year presenting to the Department of Forensic Medicine and Toxicology, Dhulikhel Hospital. The corpses are randomly selected and is assessed for the statistics regarding the epidemiology based on the autopsies performed. The Autopsy reports are anonymized with the patient code number, and sex, time of death, manner of death, pattern of death and cause of death data is documented. During the study period on one year, a total of 258 cases of medicolegal autopsies were performed at Department of Forensic Medicine and Toxicology. Out of the 258 cases analyzed maximum incidence of the postmortems were reported in the age group of 43.80% was reported from 20 to 39 years aged group which are the most productive years in one's life. The maximum incidence of the postmortems was reported in the male population of 70.54% compared to the female population (29.46%). Our strongest conclusion is that male/female differences in medicolegal autopsies are highly dependent on historical time and geographic location. The maximum incidence 32.56% was reported within 6 – 12 hours' time group and minimum incidence 12.02% was reported within 0 – 6 hours' time group. The maximum incidence 48.06% was reported from Suicide group and minimum incidence 6.20% was reported from Homicide group. The maximum incidence 33.72% was reported by Hanging group and minimum incidence 0.39% were reported from Choking and Traumatic Asphyxia groups during the medicolegal autopsies.^{1–6}

6. Source of Funding

None.

7. Conflict of Interest

None.

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