

Original Research Article

Comparative trends of accidental to intentional mortalities over a one-year period at a tertiary care centre

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ABSTRACT

Background: The trends of deaths due to unnatural incidents are on the rise each year throughout the world, including India. Incremental trends have been observed in all mortalities throughout the country. Although all these mortalities seem preventable, yet not much has been achieved over the years. Intentional mortalities are yet more preventable as compared to non intentional ones. The trends of unnatural deaths were observed at a tertiary care centre of the capital city of Rajasthan to determine the comparative magnitude of such fatalities to predict possible reasons for them.

Methods: An observational study was carried out for a one year period (2013-14) at the Department of Forensic Medicine of an apex institution of the capital metropolitan city to determine the comparative trends of accidental to suicidal and homicidal deaths amongst the medico-legal autopsies carried out over the study period. The results were analysed to look into the probable reasons for these preventable deaths.

Results: Accidental fatalities contributed maximally followed by suicides and homicides. All types of unnatural deaths were more commonly observed in young adult male population. Road accidents were the major offenders followed by thermal injuries and falls. Intentional fatalities due to self harm or other human beings shared a considerable burden among unexpected mortalities over the study region.

Conclusions: Majority of the reported fatalities were preventable deaths occurring amongst the active and productive population and hence, it is of utmost importance to analyse such deaths to suggest remedial measures bring down the toll of such causalities.

Keywords: Accidental deaths, Cause of death, Intentional mortalities

INTRODUCTION

Death is a tragedy in whatever form, at whatever time and in whatever way it comes. From medico legal point of view, deaths are of two types natural and un-natural. Death is unnatural when caused prematurely against the order of nature due to injury or poisoning. The spectrum of medico legal deaths includes all unnatural deaths whether homicidal, suicidal or accidental and suspicious deaths. Unnatural deaths happen almost everywhere in the world. The number and variety of medico legal deaths

has inflated tremendously in the recent years. Many cultural and socio-economic factors of a country are usually related to the causation of unnatural deaths. Unnatural death is one of the indicators of level of social and mental health.¹ Unnatural deaths due to various causes have a serious psychological and social impact on the family and community.² Pattern of unnatural deaths is a reflection of the prevailing social set up and mental health status of the region.³ Constantly increasing number of unnatural deaths point towards deranged psyche of the nation. Data on unnatural deaths in a particular

geographic area can also give the reflection of its law and order situation. A low value can be described in favour of peace, harmony and security to human life and property.⁴

Accidents have their own natural history and follow the same epidemiological pattern as any other deaths from disease that is the agent, the host and the environment interacting together to produce injury or damage.⁵ Types of accidental deaths include road traffic accidents, domestic accidents, industrial and work place accidents, railway accidents, fall from heights etc. Accidental deaths are more common among all other categories of unnatural deaths in home and abroad. Accidents can be labelled as unintentional events leading to unprecedented outcomes of injuries or mortalities. Another group that forms a major threat resulting in unnatural mortalities are those due to intentional self harm and deaths resulting from intentional harm caused by one person to another by various means including attack with weapons, asphyxiation episodes, poisonings or other methods used for culpable homicides.

This observational study was initiated to observe the comparative trends of such unnatural unintentional to intentional fatalities at an apex institution of Jaipur region. An attempt was made to explore the probable causes of these mortalities and an attempt was made to suggest remedial measures for their prevention.

METHODS

The study was conducted over a one-year period during 2013-14 at the Department of Forensic Medicine at the apex referral centre of the state of Rajasthan. The study design was an observational study. All unnatural deaths reported at the morgue during the study period were considered for inclusion in the study. Deaths determined to be naturally occurring on autopsy examination and sudden deaths due to undetermined causes were excluded from the study. Negative consent and non conduction of medico legal autopsy were the other exclusion criteria.

After selection of cases as per inclusion and exclusion criteria, and after obtaining informed written consent, all details pertaining to personal information, socio-demographic profile, brief details of incidence and

alleged manner of the incidence, were recorded as per the proposed Performa.

After full filling the requisite medico-legal formalities, the post-mortem examination was performed for each subject as per norms and all details related to external and internal examination; pattern of injuries, if any; other significant findings; and, cause, mode and manner of death were noted down. The manner of death was concluded on the cumulative basis of the informations furnished in the police inquest report, history stated in the treatment record during admission and history given by the attendants of the deceased at the time of post-mortem examination along with the corroboration with the autopsy findings observed. The cases where the manner could not be established or in cases with controversial history and findings were categorised as cases of undetermined intent.

All relevant details of each case was tabulated in Microsoft Excel sheet to create a database which was further analysed using the various functions of Excel and statistical software using SPSS 16 version to deduce observations and conclude them effectively.

RESULTS

A total of 3306 medico-legal autopsies were conducted during the study period. Out of them, 3172 autopsies fulfilling the inclusion and exclusion criteria were included in the study. Though the study was conducted in an urban setup; yet, ours being a tertiary care centre caters to a large numbers of referral cases belonging to nearby districts of Rajasthan and adjoining borders of Haryana and Uttar Pradesh. Thus, the study reports the trends of deaths observed at a tertiary centre which included mortalities from various rural and urban regions of the state from the zonal drainage area for health care facilities and adjoining northern and eastern boundaries. From the 3172 medico-legal autopsies of unnatural deaths included in this study, the cause of death could be ascertained on post-mortem examination in 90% cases. In rest of the 311 (9.9%) cases, the final opinion regarding the cause of death was kept reserved in want of chemical examiners and histopathological examination reports.

Table 1: Distribution of cases according to age and manner of death (n= 3172).

No. of cases	Accidental	Suicidal	Homicidal	Indeterminate	Total
0-10	56	00	03	00	59
10-20	260	40	08	03	311
20-30	865	107	36	15	1023
30-40	569	53	16	08	646
40-50	475	26	07	13	521
50-60	298	11	13	06	328
60	266	02	11	05	284
Total	2789	239	94	50	3172

These included cases with alleged history of poisoning as per inquest papers, treatment record, history given by attendants and also there were certain other cases where definite cause of death could not be concluded upon the

basis of postmortem examination and thus the cause of death was kept reserved for receipt of visceral examination reports. However, trauma or disease process were ruled out at the time of autopsy in all these cases.

Table 2: Distribution of subjects according to cause and manner of death (n= 3172).

Cause of Death	Accidental	Suicidal	Homicidal	Undetermined	Total
Road Traffic accidents	1652	0	0	2	1654
Thermal injury deaths	477	19	16	2	514
Deaths due to poisoning	125	116	7	19	267
Deaths due to Fall from Height	248	1	2	3	254
Electrical and lightening injury deaths	118	0	0	0	118
Asphyxial deaths	8	92	2	6	108
Railway injuries	76	9	1	18	104
Other Accidental Deaths	66	0	0	0	66
Deaths due to Assaults - Sharp and Blunt Trauma	0	0	61	0	61
Mortality related to animate injuries	16	0	0	0	16
Fire Arm and explosion deaths	3	0	5	0	8
Suicidal sharp cut Injury related deaths	0	2	0	0	2
Total	2789	239	94	50	3172

Majority of the unnatural deaths were accidental (87.93%) in nature followed by 7.54% suicidal deaths. Only 2.96% deaths were homicidal in nature and in 1.57% cases, the manner remained undetermined. The pattern of manner of death was corresponding to the distribution of numbers of unnatural deaths in both sexes.

Majority of deaths in both sexes were accidental followed by suicidal and homicidal deaths. The proportion of suicidal deaths was higher in the female population than accidental and homicidal deaths when compared to the male population of the study group. Accidental deaths were present in 80% of male population. Amongst the suicidal deaths there were 60.7% males and 39.3% females which is a higher proportion as per the distribution of both sexes (78.28% males and 21.72% females) in study group. This indicates the increasing trend of suicidal deaths in female population.

Maximum numbers of accidental deaths were seen in the age group of 20-30 years, followed by 30-40 and 40-50 years. The maximum numbers of suicidal deaths were also seen in the age group of 20-30 years followed by 30-40 years and 10-20 years.

All road accident cases were accidental except two cases in which suspicion existed and the manner of death remained controversial for investigation officer to conclude later. Majority of the deaths due to burns, falls and railway injuries were accidental in nature and those due to poisoning and asphyxial episodes were suicidal in nature. Deaths due to electrocution and animal harm were exclusively accidental in nature and deaths of allegedly

assaulted subjects were homicidal in nature as per history elicited and police inquest papers. Fire arm injuries were homicidal and accidental in nature with no case of suicidal fire arm injury.

DISCUSSION

In about 90.1% unnatural deaths, the cause of death could be determined at the time of post-mortem examination as also reported in earlier studies.^{6,7} In 87.93% cases of the present study, the unnatural deaths were accidental in nature; majority of which were road accidents followed by burns, falls, electrocution, poisonings and train accidents. An 7.54% deaths occurred due to suicides and 2.96% due to homicides. In remaining 1.57% cases, the manner of death remained indeterminate. India being a poor country with a high unemployment and illiteracy rate, the crime rate is expected to be very high. But, the results of the present study show a negligible percentage of homicidal deaths. This perhaps, could be attributed to the religious and traditional God fearing values passed on from generation to generation. Also, these results are an indicator of establishment of law and order situation and peace in the region. No deaths were documented during the study period due to some armed robbery or theft which again points towards the activeness of law enforcing agencies in the region.

Most other studies have also reported similar trends with slight variations- Accidents (68.92%), followed by homicides (11.69%) and suicides (8%); Accidental deaths (75%) followed by suicidal (20%) and homicidal (5%) deaths; Accidental deaths (79.3%) followed by suicidal

(13.9%) and homicidal (6%) deaths; Accidental deaths (87.5%) followed by suicidal (10%) and homicidal (2.5%) deaths; Accidents (75.22%), followed by homicides (14.29%) and suicides (10.76%); Accidents (67.5%), followed by homicides (31.4%) and suicides (1.1%); accidents in highest numbers followed by suicides and homicides; and, Accidents, suicides, homicides and undetermined deaths were 63.1%, 29.8%, 2.8% and 4.3% respectively.^{4,7-13} However, few studies have reported different trends with higher proportions of intentional fatalities.¹⁴⁻¹⁶

Majority of the accidental deaths occurred due to road accidents (59.2%), burns (17.1%), falls from height (8.9%), poisoning (4.5%), electrocution (4.2%), train accidents (2.7%), other accidents (2.4%), animal injuries (0.5%), drowning (0.3%) and firearm related accidents (0.2%) as also reported by most other authors.^{7,13} Preferred ways of suicide in the present study were poisoning (48.5%), hanging (38.5%), burns (8%), train accidents (3.8%), cut injuries (0.8%) and falls (0.4%). Similar observations have been reported by other authors.^{13,14} Homicidal deaths were majorly due to episodes of assault (64.9%), burns (17%), poisonings (7.5%), gunshot injuries (5.3%), strangulation (2.1%), fall from height (2.1%) and railway track injuries (1.1%) respectively. Our results are similar to most studies with slight variations.^{4,14} Majority of unnatural accidental deaths occurred due to transport accidents (55.44%) which are globally acclaimed to take away maximum lives per year as also reported in most other studies.^{6,8,9,11,15}

The ongoing revolution of evolving faster and better means of transport, the world over, has brought along with it an important and unwelcome guest-road traffic accidents. These have taken an almost epidemic form in the recent past. This is particularly true of our country where traffic rules and traffic sense are not very stringently practiced. India being a developing country has lesser awareness amongst people as regards to traffic sense and thus are more prone to transport accidents including road traffic accidents. Due to lack of awareness there are defaulting vehicles and illegal vehicles especially in rural regions which increase the vulnerability of rural population to transport accidents. Rest of the deaths due to transport accidents included railway accidents and workplace related transport accidental deaths including agriculture. Road traffic and railway accidents, burn, electric injuries, poisoning, falls from height and firearm injury were responsible for 92% of the total unnatural deaths as also reported in other studies.^{8,14,16} These results varied from two studies where thermal injuries were the predominant accidental deaths.^{13,17}

These variations are subject to social and cultural variations, economic disparities and heterogeneity of population and their lifestyles. Like road accident fatalities, the deaths due to poisoning were also seen in

higher proportion in rural population, as also reported by other authors.^{14,18}

Majority of the fatal accidents showed a male preponderance; however, there was higher incidence of accidental female deaths due to burns which emphasise the fact that the burn fatalities in India go beyond the meaning implied in the term 'accident' to be aptly termed as a 'Social Calamity'. The high incidence of burn deaths, especially among the young females is often attributed to cooking on open unguarded flames. Loose, voluminous, highly inflammable, synthetic garments/saris of the victims are alleged to catch fire suddenly while cooking. Kerosene oil, match sticks, and other cooking material, being easily available in houses, is usually preferred by Indian women to commit suicide, and as for killing, it helps to hide not only the torture and other means of violence but also helps to tamper with or even destroy the circumstantial evidence. Earlier studies have reported similar findings.^{7-9,14,17}

CONCLUSION

Unnatural deaths are known to claim a substantial number of lives especially in developing country like India. Analysis of unnatural deaths in society not only gives an idea of the manner of death but also it reflects the socio-economic status of the society. Unfortunately but realistically; there is little that the autopsy surgeon can contribute to the elucidation of factors leading to the unnatural deaths. Preventive measures should be adopted promptly wherever possible to avoid all unnatural deaths. Public enlightenment, good road maintenance and safe driving culture as well as sustainable security for life and property would reduce the incidence of these preventable deaths.

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