



## SPECTRUM OF MEDICOLEGAL AUTOPSIES IN A TERTIARY CARE CENTER IN ANDAMAN AND NICOBAR ISLANDS : CAUSES AND TRENDS OVER TWO DECADES.

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**ABSTRACT** **Introduction:** Deaths can be due to natural and unnatural causes. While the trend in natural deaths in an area reflects the prevalent healthcare practices in an area, the pattern of unnatural deaths in an area conforms with the psychosocial, environmental and mental health. **Material And Methods:** This was a retrospective study of autopsies conducted at a tertiary care hospital in Andaman and Nicobar islands over a period of 20 years from 1995-2015. The demographic data was collected from the institutional register. Record and analysis were done using MS Excel. **Results:** Out of total of 3374 deaths, males were 72.8% and females were 27.2%. Majority of deaths were in the productive age group of 20-39 years (46.5%). Cardiovascular deaths comprised maximum cases of natural deaths (59.8%). Hanging was the most common cause of unnatural death (25.1%) followed by RTA (17.4%). Amongst deaths due to RTA, male to female ratio was 2.5:1. However, deaths due to burns showed a higher predominance in females with female to male ratio of 6.4:1. **Conclusion:** Medicolegal profiling of autopsy provides an important statistical measure to gauge the causes and patterns of untimely loss of human life. Analyzing these and taking imperative measures to curb the same helps in preserving human resources and contribute to country's development.

**KEYWORDS :** Autopsy, Medicolegal deaths, Forensic Pathology

**INTRODUCTION**

Autopsy meaning to see oneself is used as a term in medical language to acknowledge the investigative dissection of a living body and hence ascertaining its manner and cause of death. The death rate in India is currently 7% and, fortunately has shown a consistent declining trend since the past 20 years [1].

Deaths can be due to natural or unnatural causes. The natural deaths include all the non-accidental and/or non-homicidal causes of deaths. These can be due to cardiovascular, respiratory, gastrointestinal or other medical pathologies. While unnatural causes include road traffic accidents, hanging, drowning, burns, electrical burns and poisoning.

The importance of this demographic based study lies in the fact that analyzing a data over 20 years can aid in ascertaining the cause of deaths and find the loophole areas where governmental intervention and personal intervention can be applied. This will have direct repercussions in cautioning and probably saving the individuals of productive age group, thus leading to further growth of the country.

**MATERIAL AND METHODS**

The present study is a retrospective study of medicolegal autopsy profiles received at G.B.Pant Hospital, Port Blair, Andaman and Nicobar Islands, over a period of 20 years (1995-2015). It was a record-based study and the details of cases were procured from institutional register with a predesigned format (viz. age, sex, calendar month, residence, causes of death & manner of death) and the data was analyzed using MS Excel (Microsoft 2019).

**RESULTS**

In this retrospective descriptive study, 3374 medicolegal autopsies, were received at the institution over a period of 20 years. The cases were divided into four groups according to age and gender (table 1).

**Table 1. Distribution Of Cases With Respect To Age Groups And Gender**

Age group	Male	Female	Total	Percentage (n=3374)
0-19	215	218	433	12.8
20-39	1071	498	1569	46.5
40-59	1000	164	1164	34.5
>60	169	39	208	6.2
Total	2455	919	3374	100

Out of the 3374 autopsy profiles, 2455 (72.8%) were males and 919 (27.2%) were females. A significant proportion of the deceased were in

the age group of 20-59 years (81%). Predominantly, the age group between 20-39 years comprised the maximum percentage of cases (46.5%).

**Categorization Of Causes Of Death**

**Table 2. Causes Of Death**

Category	Number of cases (n=3374)
Natural causes	1062
Hanging	848
RTA	583
Burns	542
Poisoning	216
Drowning	111
Electrical burns	12

The various causes of deaths as depicted in table 2, showed that majority were due to natural causes, due to underlying medical pathologies (n=1062, 31.5%). Following this, were deaths due to hanging (n=848, 25.1%), road traffic accidents (RTA) (n=583, 17.4%), burns (n=542, 16.1%), poisoning (n=216, 6.4%), drowning (n=111, 3.3%) and electrical burns (n=12, 0.4%).

**Distribution Of Causes Of Death In Relation To Age Group And Gender**

**Table 3. Distribution Of Causes Of Death With Respect To Age Groups And Gender**

Age Group	0-19		20-39		40-59		≥60		Total (n=3374)
	M	F	M	F	M	F	M	F	
Natural causes	60	28	316	67	454	53	71	13	1062
Hanging	48	65	339	120	216	20	35	5	848
RTA	44	6	234	30	190	29	38	12	583
Burns	25	94	81	236	48	46	6	6	542
Poisoning	15	20	61	39	56	11	12	2	216
Drowning	17	5	36	6	34	5	7	1	111
Electrical burns	6	0	4	0	2	0	0	0	12

Amongst the deaths due to natural causes, majority were in the range of 40-59 years (47.7%), followed by 20-39 years (36.1%). Majority of deaths due to RTA were in the age range between 20-39 years (45.3%), followed closely by age range between 40-59 years (37.6%).

The age range between 20-39 years comprised the majority of deaths due to burns (58.5%), hanging (54.1%), poisoning (46.3%) and drowning (37.8%). Deaths due to electrical burns were predominant in the age range of 0-19 years (50%). The details have been summarized in table 3.

**Causes Of Natural Deaths****Table 4. Causes Of Natural Deaths**

Age Group	0-19		20-39		40-59		≥60		Total
	M	F	M	F	M	F	M	F	
Cardiovascular	10	8	190	20	327	30	44	6	635
Respiratory	40	10	100	37	100	20	17	5	329
GI related	10	10	26	7	27	3	10	2	95
Obstetric	0	0	0	3	0	0	0	0	3

Out of 1062 cases brought dead due to natural causes, majority of patients died due to cardiovascular causes (n=635, 59.8%), predominantly due to myocardial infarction. Other cardiovascular causes of death included aortic dissection and cardiomyopathies. Deaths due to respiratory diseases were the second most common cause amongst natural deaths (n=329, 31%). Other causes of natural deaths included gastrointestinal diseases and obstetric complications (8.9% and 0.3% respectively). Table 4 summarizes the distribution of various causes of natural deaths in this study.

**Sex comparison of deaths due to RTA (n=583)****Table 5. Distribution Of Deaths Due To RTA Amongst Males And Females With Respect To Various Age Groups**

Age group	Male	Female
0-19 (M=215, F=218)	44 (20.5%)	6 (2.8%)
20-39 (M=1071, F=498)	234 (21.8%)	30 (6%)
40-59 (M=1000, F=164)	190 (19%)	29 (17.7%)
≥60 (M=169, F=39)	38 (22.5%)	12 (30.8%)

Amongst deaths due to RTA in the age range of 0-19 years, male to female ratio was 7.3:1. Similarly, in the age range of 20-39 years, male to female ratio was 3.6:1. Sex distribution in the age range of 40-59 years, male to female was 1.1:1, as depicted in table 5.

**Sex comparison of deaths due to burns (n=542)****Table 6. Distribution Of Deaths Due To Burns Amongst Males And Females With Respect To Various Age Groups**

Age group	Male	Female
0-19 (M=215, F=218)	25 (11.6%)	94 (43.1%)
20-39 (M=1071, F=498)	81 (7.6%)	236 (47.4%)
40-59 (M=1000, F=164)	48 (4.8%)	46 (28%)
≥60 (M=169, F=39)	6 (3.6%)	6 (15.4%)

Deaths due to burns showed a uniform higher predominance amongst females in all the age groups. The age group between 20-39 years, which constituted maximum number of cases (n=254) of deaths due to burns showed a male to female ratio of 1:6.2. Whereas, the second ranking age group amongst deaths due to burns were 0-19 years (n=119), where the ratio was 1:3.7 (table 6).

**DISCUSSION**

The statistical trends of medicolegal deaths and their evaluation constitute an important demographical data which helps to visualize the voids and analyze areas of intervention required to reduce the number of deaths and hence contribute to escalate the quality and strength of a country's resources.

Out of total 3374 cases, males accounted for a greater percentage of deaths in comparison to females (72.8%; 2455/3374 males vs 27.2%; 919/3374 females). This is in accordance with the male predominance found by other authors like Murthy et al [2] who studied 150 cases out of which 123(82%) were males & 27(18%) females. Mugadlimath et al [3] studied 64 cases out of which 39 (61%) were males and 25 (39%) females. Similarly, Singh et al [4] found 74.8% males and 24.2% females in their study, while Radhakrishna et al [5] found 69% males in their study.

In the age-wise distribution of our cases we found that maximum number of postmortems were in the age range of 20-39 years (n=1569; 46.5%) followed by 40-59 years (n=1164; 34.5%). This is in accordance with the other studies by Radhakrishna et al [5], Kannan et al [6], Curran et al [7] and Bansude et al [8]. Amongst all the female deaths in the study (n=919), maximum was in the age range of 20-39 years (n=498; 54.2%). These findings were similar to those of other studies, mainly pertaining to Indian subcontinent, where majority of female deaths were found to be in the similar age range [9-13].

Out of 3374 cases, deaths due to natural causes accounted for 31.5% (n=1062) and unnatural causes comprised 62.5% (n=2312). The

number of unnatural deaths in an area reflects the level of social and mental health of the society. Such a higher incidence due to unnatural causes was also found by Radhakrishna et al in their study comprising 1328 medicolegal deaths in a tertiary care center [5].

Amongst the natural deaths (n=1062), majority was due to cardiovascular causes including MI, aortic dissection and cardiomyopathies (n=635; 59.8%). The age range with maximum number of deaths due to cardiovascular diseases was between 40-59 years (n=357; 56.2%), followed by 20-39 years age group (n=210; 33.1%). Moreover, amongst these age group there was a significant male preponderance (M:F=10.3:1), thus showing that cardiovascular disease risk and death is a much more common cause of natural death in males. Study by Radhakrishna et al [5] also had higher cases of cardiovascular deaths amongst the natural death cases.

Following the natural deaths, hanging was the most common cause (n=848; 25.1%), followed by road traffic accidents (n=583; 17.3%), burns (n=542, 16.1%), poisoning (n=216; 6.4%), drowning (n=111; 3.3%) and electrical burns (n=12; 0.003%). However, in other studies like those by Bansude et al [8], Awadesh et al [14], Junaidi et al [15] and Patel et al [16], road traffic accidents were the most common cause of deaths. Andaman and Nicobar Islands are group of islands situated 1000 km away from mainland India with a predominantly rural population (62.3%) and the topography of the land is much different from rest of India. The difference of result in our study may be due to this topographical variation making road traffic accidents second most common cause in our study.

Amongst deaths due to RTA, male to female ratio was 2.5:1 (corrected for the greater number of male deaths than female deaths in the study). The higher prevalence of deaths due to RTA in males can be attributed to males being breadwinner in majority of household and hence their more frequent outdoor activities. This increased male preponderance for deaths due to RTA was similar to other reports [17, 18].

Globally, majority of burn victims are females [19]. In our study, 41.6% (382/919) of all the females died due to burns related injuries. The peak incidence of deaths due to burns in females was found in the age group 20-39 years (61.8%; 236/382). The indoor nature of life amongst females in rural and semi-urban set-up where females are the primary person accessing domestic fuels for cooking can attribute to these results. Another plausible cause is the custom of dowry related deaths which has been plaguing the Indian society since long. These results were similar to the study by Kumar et al [20].

Other causes of unnatural deaths such as poisoning and drowning also showed a similar male preponderance as other studies [18,20,21].

**CONCLUSION**

In our knowledge, this study is the largest study both in terms of number and time frame highlighting the medicolegal profiles in autopsies at a tertiary care center. It highlights the major problem as follows:

- Majority of deaths occurred in the productive age group of 20-59 years.
- Cardiovascular diseases formed the highest contributor to the causes of natural deaths amongst our cases
- Hanging was the most common cause of unnatural deaths in our study.
- RTA was the second most common cause of unnatural deaths with a higher male preponderance.
- Deaths due to burns were found to be higher in females.

Thus, the policymakers need to construct better and stringent laws, improved healthcare especially mental health facilities and measures to raise awareness (safety practices, psychosocial awareness) amongst the mass as untimely loss of human life is depreciating to the country's economy.

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