

A Study of Unnatural Death Profile in Mangalore, Southern India 2011-2020

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ABSTRACT

When death is unexpected, sudden, litigious, or unexplained, or if it is a criminal death, an autopsy becomes imperative. A forensic autopsy or medicolegal autopsy is "an examination conducted postmortem to address medicolegal objectives. A comprehensive profile of medicolegal autopsies undertaken over ten years (2011-2020) was evaluated at the A.J. Institute of Medical Sciences & Research Centre, Mangaluru/Mangalore. Of the 1842 autopsied incidents, Sixty-two per cent of the autopsied victims were males. Seventy per cent of the overall deaths were between 20 and 49 years old. Road Traffic Accidents (R.T.A.) accounted for 45% of autopsied cases. The 3rd and 4th decades showed peak incidences of Road Traffic Accidents, fall from height, drowning, and burns. Seventy-six percent of unnatural deaths were accidental, 71.9% were due to road traffic incidents. Unnatural deaths do have medicolegal, social and preventive facets. Despite preventive measures, the dominance of Road traffic fatalities is a crucial cause of concern. The multipronged approach involving individuals, family, society, and law enforcement agencies will go a long way in preventing this vast and unfortunate loss of human lives because of accidents.

Keywords:Medicolegal autopsy; Postmortem; Road Traffic Accidents (R.T.A.) Unnatural deaths .

INTRODUCTION

When death is unexpected, sudden, i.e. rapid in its course, suspicious in nature, mysterious, or even unwitnessed, ambiguous, litigious, or unexplained, or if it is a criminal death, industrial death, death accompanying surgical/medical treatment and where medical negligence is

supposed or anaesthetic deaths, an autopsy becomes imperative.^{1,2} A forensic autopsy or medicolegal autopsy is "an examination conducted postmortem to address medicolegal objectives". Medicolegal postmortem examinations are carried out according to the law of the land so that justice is delivered.

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In India, medicolegal autopsies are hence undertaken out either on appeal of the police investigating authorities or the magistrate. In both, the key aim is to uncover the cause of death and to assess if this and the hypothesised type of death match.

A.J. Institute of Medical Sciences & Research Centre, Mangaluru/Mangalore, is the premier teaching tertiary health care centre in coastal Karnataka, which lies in India's southern part. It is one of the largest healthcare institutions in this part of the world, catering to the needs of the population of not only Karnataka but also extending to the areas in the neighbouring states of Kerala, Maharashtra, and Goa. A comprehensive profile of medicolegal autopsies undertaken over ten years (2011–2020) was evaluated to illustrate their complete epidemiological features. An attempt was also made to evaluate the extent and form of unnatural deaths that occur in this region in order that probable protective actions can be recommended and consequently taken up.

MATERIALS AND METHODS

This retrospective ten-year research was conducted in the Department of Forensic Medicine & Toxicology, A.J. Institute of Medical Sciences & Research Centre, Mangalore and comprised a sum of 1842 cases that were autopsied in our mortuary between January 2011 and December 2020. The applicable data was analysed from inquest papers, chemical analysis reports, postmortem reports, findings on histopathology examination and a victimological report with a highlighting of the cause and manner of death.

A causal sequence of events that in the end leads to death is the cause of death, and the type of death/manner is the way in which this was brought about. The type/manner of death may either be natural or violent i.e. unnatural, or indeterminate. It is determined mainly by the evidence arising out of the investigation and the postmortem findings. The type/manner of death remains indeterminate / unresolved if either the information about the

situation(s) is lacking or when the cause of death is ambiguous/unidentified".^{3,5}

RESULTS

It is evident from Table 1 that the year 2020 recorded the highest number of medicolegal autopsies (n=253), followed by the years 2018 (n=216), 2019 (n=208), and 2016 (192), as depicted in Fig. 1.

Of the 1842 autopsied incidents, 62% (n = 1142) of victims were male, and 38% (n = 700) were females.

The age of the victims varied from a three-year-old child to older individuals as old as 93 years old, the highest being the fourth decade (n=479, 26%). Around 70% (n=1233) of the overall fatalities were in the age band of 20-49 years. (Fig. 2)

Frequency distribution of the cause of death revealed Road Traffic incidents/accidents (R.T.A.) as the leading cause, making up 45% (n = 825), followed by sudden natural death (n=327, 18%), hanging (n=169, 9%), fall from height (n=155, 8%), Poisoning

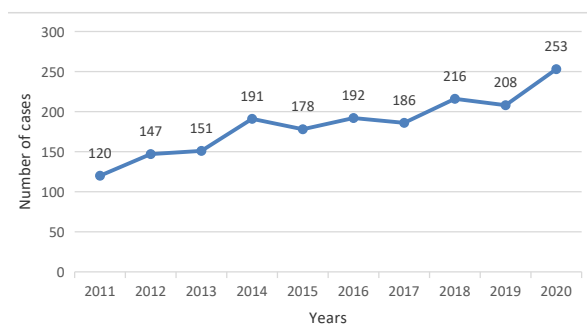


Fig. 1: Year-wise distribution of victims

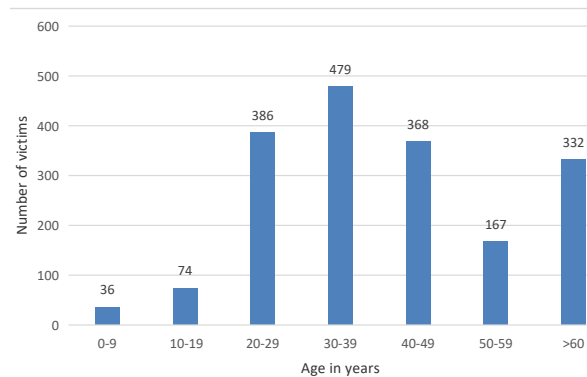


Fig. 2: Age-wise distribution of victims

Table 1: Age-wise and gender-wise distribution of cases based on the cause of death

Cause of Death	Age in years														M:F
	0-9		10-19		20-29		30-39		40-49		50-59		>60		
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
R.T.A.	10	8	31	12	121	91	154	102	104	82	12	9	58	31	1.5:1
Natural	0	0	2	1	16	10	15	7	28	13	45	30	98	62	1.7:1
Hanging	0	0	2	0	19	11	35	19	28	14	14	10	10	7	1.8:1
Fall from height	7	4	10	6	23	9	35	12	21	7	4	1	12	4	2.6:1
Poisoning	1	1	2	0	21	9	20	12	23	13	15	10	14	7	1.8:1
Burns	2	2	1	2	14	10	26	14	6	4	6	6	6	5	1.4:1
Drowning	0	1	3	2	13	8	8	7	8	4	2	2	5	3	1.4:1
Assault	0	0	0	0	6	3	8	4	6	4	0	0	7	3	1.9:1
Undetermined	0	0	0	0	0	2	1	0	3	0	1	0	0	0	2.5:1

(n=148, 8%), Burns (n=104, 6%) and Drowning (n=66, 4%) as shown in Table 1. Road Traffic Accidents (R.T.A.) remained at the top as the leading cause, except in 2020, wherein sudden natural deaths outnumbered all the other causes. Assault cases accounted for 2% (n=41) of unnatural deaths, comprising of victims of violence with blunt and sharp force. In 5 cases, the cause of death remained undetermined. Males predominated over females in every type of cause of death across the age groups, ranging from 1.4:1 (Burns and drowning) to 2.6:1 (fall from height). However, personal characteristics of the individual cause of death diverged from one to another. The third and fourth decades showed peak incidences of Road Traffic Accidents, fall from height, drowning, and burns; the fourth and fifth decades showed peak incidences of assault, Poisoning, and hanging. The sudden natural deaths peaked during the sixth and seventh decades.

Of the total 1842 autopsied cases, 81.9% of victims (n = 1508) had unnatural death, 17.8% (n=327) victims had natural death, and in 0.3% (n=7) victims, the cause of death remained undetermined. 76% (n = 1146) of unnatural deaths were accidental or inadvertent, and 71.9% (n = 825) were because of road traffic incidents/accidents. Poisoning and hanging made up 90% (n = 289) of total suicides.

DISCUSSION

Due to its increasing prevalence, unnatural deaths pose a considerable public health challenge worldwide.⁶ This has caused an enduring negative impact on an individual's family, in addition to the society and the nation at large.⁷ It is also a vital indicator of social and mental well-being.²

A substantial share of unnatural mortality, even globally, results from suicides, homicides and road traffic incidents/accidents (R.T.A.s).⁸ In 2019, suicide resulted in the deaths of an approximated 703,000 people. The global age-standardised suicide rate was 9.0 per 100,000 population for 2019, greater in males (12.6 per 100,000) than in females (5.4 per 100,000). Region wise, "The suicide rates in South-East Asia (10.2 per 100,000), Europe (10.5 per 100,000) and Africa (11.2 per 100,000), were higher than the global average (9.0 per 100,000) in the same year. The least suicide rates were present in the Eastern Mediterranean regions (6.4 per 100,000)".⁹

Victims of intentional homicide numbered 464,000 in 2017. This corresponded to a worldwide homicide rate of 6.1 per 100,000 population. Men add up to almost eighty per cent of all homicide victims worldwide. America and Africa surpass the global average with 17.2 and 13 victims per 100,000

populations. By comparison, the homicide rate calculated in Europe was 3.0 per 100,000 population. The region with the lowest homicide rate of 2.3 per 100,000 population was Asia, which houses sixty per cent of the global population but accounts for only twenty-three per cent of total homicide victims.¹⁰

An estimated 1.35 million people die yearly due to Road traffic incidents/accidents (R.T.A.s) globally. The deceased profile among these shows that it is primarily the vulnerable road users who account for most of these deaths: pedestrians, motorcyclists, and cyclists. The annual death rate due to road traffic incidents is around eighteen per hundred thousand population globally. The numbers are greatest in the African and South-East Asian regions, following countries in the Eastern Mediterranean and Western Pacific regions. Countries in Europe and the Americas have the lowest regional death rates of 9.3 and 15.6 deaths per hundred thousand people, respectively. It is the number one cause of death among young adults under the age of 30 years.¹¹

Deaths resulting from road traffic incidents, suicides, and homicides represent a prevalent and challenging public health issue in India. An estimated 173,347 completed suicides occur annually in India, which is around 12 per 100,000 population.⁹ To also be considered is that there are considerable variations in the rates of suicide among the socioeconomic classes and the Indian states.^{12,13} WHO estimated 299,091 road traffic fatalities in India in 2016 and a death rate of 22.6 per 100,000 people, far higher than the global average.¹¹ In 2019, there were "close to 29 thousand murders reported across India and furthermore, more than 57 thousand attempted murder cases were filled in the country that year".¹⁴

In this study, the subjects of medicolegal autopsies were predominantly males, similar to other studies from India,^{2,15-19} Bangladesh,²⁰ Indonesia,²¹ Nigeria,²² South Africa²³ and Denmark²⁴. When examining the Male to

female ratio, it differed for different causes of death, ranging from 1.4:1 for burns and drowning to 2.6:1 for falls from a height which was in unison with the overall trend reported from various regions of India,^{2,16,25,26,27} Libya,²⁸ and Norway²⁹. Sex ratio reversal was apparent for assaults and road traffic incidents in a Norwegian study.²⁹

In this study, 70% of the aggregate fatalities were aged 20-49 years. A similar trend of peak incidence in middle-aged adults was observed in studies published in India,^{2,30,17,31} Bangladesh²⁰ and Nigeria²².

Road traffic accident is the leading contributor of medicolegal autopsies (45%) conducted with the population between 20 and 39 years, forming the bulk of R.T.A.s (57%). This finding is in concurrence with earlier findings encountered across the globe.^{2,20,22,25,29} This vulnerability of the younger age group to Road traffic accidents could be the fact that this is the most active phase of a person's life in all aspects, be it physical, mental or even social. This is also the phase wherein youth are exposed to the exterior world's perils, such as raised stress, pressure and traffic. This finding of a preponderance of R.T.A.s amongst medicolegal autopsies is not in agreement with studies reported from some parts of India.^{17,18,31}

The occurrence of suicidal and homicidal fatalities in our study was comparable to those in other parts of India^{20,29}. This was true for cases seen in Norway as well,²⁹ but not in Great Britain and Libya, where suicides were low and homicidal deaths were greater in Libya, where it was twenty percent as contrasted to our 2.7%.²⁸

The occurrence of unnatural deaths was quite comparable to trends reported from various parts of India and globally. The findings regarding inadvertent/accidental deaths remains consistent regardless of the territory's diversity in landscape and demography. Unnatural deaths do have medicolegal, social and preventive facets. Despite preventive measures, the dominance of Road traffic fatalities is a crucial cause

of concern. The multipronged approach involving individuals, family, society, and law enforcement agencies will go a long way in preventing this vast and unfortunate loss of human lives because of accidents.

CONFLICT OF INTEREST: NIL

SOURCE OF FUNDING: NIL

ETHICAL CLEARANCE: Ethical clearance was obtained before undertaking the research study from Institutional Ethical Committee of A.J. Institute of Medical Sciences & Research Centre, Mangalore.

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