

## ORIGINAL ARTICLE

**A Retrospective Study of Postmortem Examinations at MGM Hospital, Warangal****Manogna SK,<sup>1</sup> Surendar J,<sup>2</sup> Babu VJP,<sup>3</sup> Rao CHL,<sup>4</sup> Sree GM.<sup>5</sup>**3<sup>rd</sup> Year Postgraduate,<sup>1</sup> Assistant Professor,<sup>2,3</sup> Professor & HOD,<sup>4</sup> 1<sup>st</sup> Year Postgraduate.<sup>5</sup>

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**Abstract:**

An autopsy (post mortem examination) or necropsy is a common, up-to-date medical technique in which the tissues and organs of a deceased person's body are thoroughly examined surgically with the goal of identifying the cause of death and any contributing factors. Now a days poisoning and road traffic accidents cause most of the casualties, which lead to many deaths. To create a profile of fatalities brought on by unnatural sources that we can focus our efforts on reducing their frequency, we retrospectively studied the death cases brought for medico legal postmortem examination at the Mortuary, Department of Forensic Medicine and Toxicology at Kakatiya Medical College/MGM Hospital Warangal, Telangana, India, in the year 2019 to 2021. During this period, a total of 4657 autopsy cases were conducted. The most autopsy cases [443(10%)] out of the total 4657 cases were performed in June. There were [3516(75.5%)] more male cases than female [1141(24.5%)] cases, which predominated. The largest percentage of cases [2868(62%)] belonged to the 25–54 age range. There were mostly 1644 (35%) cases of poisoning. Injury-related deaths, 988 (21%) and 557 (12%) were attributable to head injuries and multiple injuries respectively. 485 deaths by hanging (10%) and 253 deaths from thermal injury (5%) were reported. Poisoning was found to be the most common cause of mortality, and then followed by road-traffic accidents. Vehicle accidents involving head injuries were the leading cause of death.

**Keywords:** Unnatural deaths; Poisoning; Hanging; Head injury; Multiple injuries; Burns.**Introduction:**

An autopsy (postmortem examination) or necropsy is a common, up-to-date medical technique in which the tissues and organs of a deceased person's body are thoroughly examined surgically with the goal of identifying the cause of death and any contributing factors, such as tanatogenesis.<sup>1</sup> There have been several justifications for performing autopsy over the years ever since G.B. Morgagni first demonstrated their scientific worth.<sup>2</sup> The profiling of medico legal cases is necessary in order to prevent the preventable casualties in future and to study the genuine crime rate in the area. Mortality data are necessary to comprehend the underlying health of a population, in addition to advancing medical knowledge and providing assistance in an investigation.<sup>3,4</sup> To determine the main reasons for deaths in a population, mortality statistics might help health administrations. Additionally, it can offer proof that disease prevention measures should be prioritized.<sup>5,6</sup>

India is a developing country with increasing industrialization and urbanization. In our daily lives, we run into a variety of issues. While some people can handle life's stresses, others are unable to, and as a result, they pass away, making life unpleasant

for their friends and family. The goal of this study is to create a profile of deaths that are caused by natural or unnatural causes so that we can make serious efforts to reduce their incidence. The number of medico-legal cases is rising as a result of the rapidly expanding population, rising unemployment rates, unforeseen COVID-19 pandemic, widening income gaps, substance addiction, increased vehicular traffic density, sparse infrastructure, and numerous sorts of morbidities. A special Mention about the deaths during lockdown in COVID-19 Pandemic is mentioned. Prior to a two month country wide lockdown, India's initial response to the pandemic included border closures and recommendations about social seclusion (25<sup>th</sup> March 2020-31<sup>st</sup> May 2020). Four different phases of the national lockdown were enforced, with the first (25 March–14 April) having the strictest limitations compared to phases two (15 April–3 May), three (4 May–17 May), and phase four (18 May–31 May), which coincided with a gradual lifting of constraints,<sup>7</sup> on April 20, certain restrictions would be lifted [conditional relaxation] enabling the opening of agricultural supply stores and enterprises related to dairy, aquaculture and plantations. Moreover, public works programmes were permitted to reopen with the direction to uphold social distance. There would be movement of cargo via trucks, railroads and aircraft. Also, banks and government facilities dispersing benefits would operate. However, none of the studies to date have examined how suicide rates may vary in India in 2020 compared to earlier years, or whether sex and geographic differences will affect these changes. This critical gap makes it more difficult to determine whether COVID-19 is still having an impact on suicide rates in India.

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**Table 1. Total autopsies.**

Year	PME'S	%
2019	1569	34%
2020	1523	33%
2021	1565	34%
Total	4657	100%

**Table 2. Sex wise figures.**

Sex	Year								
	2019	2020	2021	Total	%	2019%	2021%	2021%	Diff 2K19 VS 2020
F	398	375	368	1141	24.5%	25.4%	24.6%	23.5%	-1.9%
M	1171	1148	1197	3516	75.5%	74.6%	75.4%	76.5%	1.9%
Total	1569	1523	1565	4657	100%				

Post mortem examination data are crucial because they help elucidate related pathology, treatment response, and disease evolution in addition to identifying the primary cause of death. Doctor scan correct, clarify, and confirm the ante mortem clinical diagnosis using autopsies, which helps them advance their understanding of medicine, hone their diagnostic skills, and put that knowledge to use in the future.<sup>8</sup> A subset of the total number of deaths reported in an area is determined via postmortem examination. In order to promote better and more accurate certification of the cause of death, this study intends to characterize the age and gender distribution as well as examine the causes of fatalities identified during postmortem investigations.

**Objectives:**

- To create a profile of fatalities brought on by unnatural sources so that we can focus our efforts on reducing their frequency.
- To determine the incidence of deaths in COVID-19 Pandemic in the year 2020.
- To compare the incidence of deaths in the year 2019, 2020 and 2021.

**Material and methods:**

All cases of deaths brought for autopsy at the Kakatiya Medical College mortuary in Hanumakonda, Warangal between January 1 and December 31, of 3 years i.e, 2019-2021 were included in this retrospective analysis.

The focus of this study has been on identifying the overall number of death cases, the sex of the persons, and the distribution by month. Age, sex, month of incidence, and cause of death at autopsy are among the cause of death characteristics that were examined. The frequency and proportion of these fatalities were calculated using the data, and the findings were expressed as percentages. This entry provides the distribution of the population according to age. Information is included by sex and age group as follows: 0-14 years (children), 15-24 years (early working age), 25-54 years (prime working age), 55-64 years (mature working age), 65 years and over (elderly).<sup>9</sup>

**Inclusion Criteria:** Unnatural deaths brought to the post-mortem examination at Kakatiya Medical College/MGM Hospital, Warangal.

**Exclusion Criteria:** • Bodies sent to the post mortem at the nearest

medico-legal centre or Govt Hospitals on request of the deceased party.

- MLC cases converted to non MLC cases by the head of the institution.

**Results and Observations:**

The study of total number of autopsy conducted in Kakatiya Medical College /MGM Hospital are 4657 cases. There are 1569, 1523 and 1565 cases in 2019, 2020 and 2021 respectively [Table no1]. It is noted that the % of sex wise distribution is more in males [about 75%] and in females [about 25%], there is 3% of decrease in deaths in 2020 when compared with 2019 and 1.9% of female deaths decreased in 2021 compared to 2019 [Table No.2]. Age group distribution shows that 62% of the deaths are seen between 25-54 age group followed by 15-24 constituting 15% of cases. Over all trend shows when compared between years i.e, 2019 vs 2020 the results show that though there were low death cases in 2020, there is 22% increase in death cases of 15-24 age group followed by 21% increase in 0-14 age group, 13% rise in 25-54 age group and decrease in death cases of 55years and above age groups. Overall trend shows when compared between years i.e, 2020 vs 2021 the results show that there is 44% decrease in death cases of 0-14 age group followed by 9% decrease in 15- 24 age group, 953% rise in 55-64 age group. Overall trend shows when compared between years i.e, 2019 vs 2021 the results show that though there were low death cases in 2020 there is 33% decrease in death cases of 0-14 age group followed by 15% decrease in 55 years and above age groups. In 2019, 45% of deaths cases were seen among males in 25-54 age group, followed by 55-64 age group comprising of 10% cases. Even in females 25-54 years age group showed more deaths [13%], followed by 15-24 and 65 & above age groups [4%]. In 2020, 52% of death cases are seen among males in 25-54 age group, followed by 15-24 age group comprising of 13%cases. Even in females 25- 54 years age group showed more deaths[15%], followed by 15- 24 and 65& above age groups [4%]. In 2021, 48% of deaths cases were seen among males in 25-54 age group, followed by 15-24 age group comprising of 16% cases. Even in females 25-54 years age group showed more deaths [11%], followed by 15-24 [5%] cases [Table no.3]. There is a huge decrease in no. of cases in April 2020 due to COVID-19 pandemic lock down. Overall highest cases were seen in June followed by May and October, November and December with constituting 10%, 09% and 09%. There is 3% of decrease in deaths in 2020 when compared with 2019 [Table no.4]. From the study it is observed that the most common cause of death is due to poisoning constituting of about 35% of total cases followed by

**Table 3. Age group wise distribution.**

Age	Year						Total %	Year wise comparison		
	2019		2020		2021			19 vs 20	20 vs 21	19 vs 21
	F	M	F	M	F	M				
0-14	18	34	26	37	15	20	3%	21%	-44%	-33%
15-24	63	147	63	193	80	171	15%	22%	-2%	20%
25-54	204	701	229	798	178	758	62%	13%	-9%	3%
55-64	47	163	1	16	42	137	9%	-92%	953%	-15%
65 & Above	66	126	56	104	53	111	11%	-17%	3%	-15%
Total	398	1171	375	1148	368	1197	100%	-3%	3%	0%
Grand Total	1569		1523		1565		4657			

**Table 4. Month wise distribution.**

Month	Year							
	2019	2020	2021	Total	Total %	19 vs 20	20 vs 21	19 vs 21
January	126	96	140	362	8%	-24%	46%	11%
February	128	152	107	387	8%	19%	-30%	-16%
March	125	102	107	334	7%	-18%	5%	-14%
April	164	59	111	334	7%	-64%	88%	-32%
May	165	133	109	407	9%	-19%	-18%	-34%
June	149	122	172	443	10%	-18%	41%	15%
July	113	131	147	391	8%	16%	12%	30%
August	127	113	142	382	8%	-11%	26%	12%
September	108	148	125	381	8%	37%	-16%	16%
October	129	145	158	432	9%	12%	9%	22%
November	119	165	120	404	9%	39%	-27%	1%
December	116	157	127	400	9%	35%	-19%	9%
Grand Total	1569	1523	1565	4657	100%	-3%	3%	0%

head injury constituting 21%, multiple injuries constituting 12% of total cases and hanging 10% of total cases. Overall trend, when compared between 2019 vs 2020 shows 49% decrease in burns cases, 11% decrease in hanging cases, 4% decrease in head injury due to road traffic accidents. Though there were less cases in year 2020, the over all trend shows 19% increase in deaths due to poisoning which might be due to easy availability and perhaps spurred on by lockdown. Overall trend, when compared between 2020 vs 2021 shows 33% decrease in burns cases, 10% increase in poisoning cases, 1% decrease in head injury due to road traffic accidents. 13% increase in deaths due to hanging. Overall trend, when compared between 2019 vs 2021 shows 65% decrease in burns cases, 1% increase in hanging cases, 5% decrease in head injury due to road traffic accidents. Though there were less cases in year 2020, the overall trend shows 31% increase in deaths due to poisoning which might be due to after effects of the unexpected COVID-19 pandemic. In 2019, the highest number of deaths were due to poisoning [31%], followed by head injury [22%], hanging [11%] and multiple injuries [11%] in males. In 2019, the highest number of deaths were due to poisoning [28%], followed by burns [20%], headinjury [17%], hanging [11%] in females. In 2020. In 2019, the highest number of deaths were due to poisoning [26%], followed by head injury [17%], multiple injuries [12%] and hanging [10%] in males. In 2019, the highest number of deaths were due to poisoning [11%], followed by burns [4%] and head injury [4%], hanging [4%] in females. In 2021, In 2019, the highest number of deaths were due to poisoning [29%], followed by head injury [17%], multiple injuries [11%] and hanging [7%] in males. In 2019, the highest number of deaths were due to poisoning [11%] followed by head injury [3%] and hanging [3%] in females [Table no.5].

**Discussion:**

The Department of Forensic Medicine and Toxicology at Kakatiya Medical College/MGM Hospital Warangal was where the current retrospective study was carried out. Males outnumbered females in post mortem cases in 1961 by a ratio of almost 3:1. This conclusion matched concurrently in the research of Radhakrishna et al.,<sup>10</sup> Sharma et al.,<sup>11</sup> Wasnik,<sup>12</sup> Shrivastava et al.,<sup>13</sup> Zine, et al.,<sup>14</sup> Qasim, et al.,<sup>15</sup> Afandi<sup>16</sup> and Patel JB, Chandegara PV, Patel UP, Parkhe SN, Govekar G.<sup>17</sup> Men often die earlier and from practically more diseases and illnesses than women. Men are more at risk than women in traditional social

**Table 5. Cause of death distribution.**

Cod	2019	2020	2021	Total	Total %	19 vs 20	20 vs 21	19 vs 21
Blunt injury-ab	11	15	26	52	1%	36%	73%	136%
Burns	136	70	47	253	5%	-49%	-33%	-65%
Chop wounds	0	0	1	1	0%	-	-	-
Cut throat	2	4	6	12	0%	100%	50%	200%
Dead born	2	3	0	5	0%	50%	-100%	-100%
Decapitation	2	0	9	11	0%	-100%	-	350%
Dog bite	0	1	1	2	0%	-	0%	-
Drowning	40	71	56	167	4%	78%	-21%	40%
Electrocution	42	26	31	99	2%	-38%	19%	-26%
Hanging	167	149	169	485	10%	-11%	13%	1%
Head injury	339	326	323	988	21%	-4%	-1%	-5%
Honey bee bite	0	0	1	1	0%	-	-	-
Hypovolemic shock	13	8	1	22	0%	-38%	-88%	-92%
Lightening	2	1	1	4	0%	-50%	0%	-50%
Multiple injuries	169	189	199	557	12%	12%	5%	18%
Natural disease	127	53	40	220	5%	-58%	-25%	-69%
Natural disease-covid19	0	1	0	1	0%	-	-100%	-
Poison	470	560	614	1644	35%	19%	10%	31%
Poison & drowning	0	9	0	9	0%	-	-100%	-
Prematurity	2	1	0	3	0%	-50%	-100%	-100%
Scalds	3	0	2	5	0%	-100%	-	-33%
Scorpion bite	1	1	0	2	0%	0%	-100%	-100%
Septic shock	13	10	11	34	1%	-23%	10%	-15%
Smothering	1	0	1	2	0%	-100%	-	0%
Snake bite	19	15	17	51	1%	-21%	13%	-11%
Spinal cord injury	2	3	3	8	0%	50%	0%	50%
Stab injury	2	2	6	10	0%	0%	200%	200%
Throttling	2	2	0	4	0%	0%	-100%	-100%
Total	1569	1523	1565	4657	100%			

justice studies of health, however gender patterns in unnatural death mortality do not match this model.<sup>18</sup> Males are more vulnerable to accidents and violence because they are more exposed to the outside world. They are regarded as wage workers, with women typically restricted to the home and housework. Age groups between 25-54 years old [62%cases], including both sexes, were the most frequently engaged in all sorts of instances in our study are consistent with the results of the research by Radhakrishna et al.,<sup>10</sup> Wasnik,<sup>12</sup> Zine et al.,<sup>14</sup> Qasim et al.,<sup>15</sup> and Afandi<sup>16</sup> and Sharma et al.,<sup>16</sup> showed the most prevalent in the age range is 21-25 years and 26-30 years. Particularly in 2020, which is the 1<sup>st</sup> year of COVID-19 Pandemic, the 25-54 age group, who are the prime working age group,<sup>9</sup> when compared to females, we saw that males were significantly more affected by the rise in suicide rates. Male suicides in India have been linked to pressure to support the family and the traditional role of men as the "bread winners" of the house hold, which has been emphasized as a possible cause.<sup>19</sup> Although it hasn't been proven, it's probable that males suffered the economic effects of the pandemic more severely on average than females, including loss of employment and accompanying role stress and humiliation. June recorded the most cases (10%), followed by October, November and December (9%) in that order. The highest number of instances, 96 (9.83%), were noted in October, while September saw 93 (9.56%) cases according to Patel JB, Chandegara PV, Patel UP, Parkhe SN, Govekar G.<sup>17</sup> Study and 12.34% of deaths in the study

by Zine et al.<sup>14</sup> occurred in the month of October. Least number of cases were recorded in the month of April 2020 [59 cases] due to COVID-19 pandemic lockdown. The majority of the research on the COVID-19 pandemic's possible effects on suicide rates has been conducted in high income nations. According to research, with Japan and Hungary standing out as major outliers 20-22 suicide rates did not generally rise during the early months of the pandemic. From the study it is observed that the most common cause of death is due to poisoning constituting of about 35% of total cases followed by head injury constituting 21%, multiple injuries constituting 12% of total cases and hanging 10% of total cases.

Even during the pandemic, poisoning was the most common approach, other suicide methods included hanging, jumping from or into objects, burning, wrist or throat slicing, drowning, and injuries. A five-year research from one of India's major cities that included more than 5000 instances revealed that the victim's methods of suicide varied. They discovered that among men, poisoning was the most popular form of suicide, followed by head injuries, hanging, burns and drowning. For women, poisoning was the most popular method of suicide, followed by hanging, burns, drowning and head injuries.<sup>23</sup> Even death due to head injury is also observed to be increased during the initial months of the pandemic. Though the reasons were unclear but it is thought to be due to the conditional relaxation of the lock down.<sup>14</sup>

The most common cause of injury-related deaths, accounting for 21% of all fatalities, was head injury. This was followed by multiple injuries (12%), hanging (10%), burns (5%), electrocution and drowning (2%) and snake bite (1%). Burns made up 10.57% and electrocution 1.99% of all occurrences of thermal type injuries respectively. Burn-related deaths came in fifth place in this analysis, behind injury-related deaths and hanging deaths. It was the second most common cause death in Zine et al. study,<sup>14</sup> behind injury-related deaths. The findings of the research conducted by Wasnik<sup>19</sup> and Qasim et al.<sup>15</sup> were in agreement with those of our study.

1644 (35% of the total 4657 post mortem cases) cases of poisoning were discovered. Organophosphate was the cause in the most cases, then snake bite and soon. This result was almost identical to those of the research conducted by Radhakrishna et al.,<sup>10</sup> Sharma et al.,<sup>11</sup> and Wasnik.<sup>12</sup> This is because a large portion of the area was made up of rural residents who worked mostly in agriculture, making pesticide poisoning more common. In this investigation, incidents of OP poisoning were the most common cause of poisoning-related deaths. Since agriculture is the primary source of income for the vast majority of the state's citizens, it's possible that agricultural poisons will be easily accessible to the general public. The second most common cause of mortality from RTA is head injury and multiple injuries, both of which can be avoided. It is unfortunate to observe that the majority of death sare caused by this factor.

Right from the junior level, traffic norms and commonsense must be taught, and laws must be properly enforced. According to this report, hanging deaths were the third most common cause of fatalities and burn cases came in fifth.

## Conclusion:

The aforementioned study analyses data on medico-legal cases submitted for autopsy at Kakatiya Medical College/MGM hospital, Warangal in aradical manner. Poisoning is found to be the most common cause of mortality and then followed by road traffic accidents. Vehicle accidents involving head injuries were the leading cause of death. An essential and necessary component of any investigation into a sudden suspicious death is a medical-legal autopsy. The abilities and knowledge of an autopsy surgeon help law enforcement organizations administer justice and hang the guilty. The information produced would help the Forensic expert gain a better understanding of the puzzling occurrence of a sudden suspicious death in their area of jurisdiction.

This study aids in the interpretation of the various medico-legal autopsy cases seen at the Kakatiya Medical College/MGM Hospital Mortuary, Warangal. Policy makers, law enforcers, and the community will gain knowledge from this that will help them examine the particulars of the cases and take appropriate action for the good of the neighborhood and the local populace. To reduce the number of casualties, health awareness campaigns regarding stress management and control as well as education campaigns to increase public understanding of traffic laws and driving regulations must be strengthened and repeated frequently.

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