

Comparison of pattern of death during Pre-lockdown period and COVID 19 lockdown period in Central Kerala – An Autopsy Study



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ABSTRACT

Background: The coronavirus pandemic is one of the deadliest pandemic in history. The authorities worldwide responded to this pandemic by implementing business closures, travel restrictions, lockdowns and quarantines. **Aims and Objectives:** To determine the type of cases and compare the patterns of deaths which came for autopsy to Department of Forensic Medicine, Government Medical College, Kottayam during the Pre lockdown period in 2019 and COVID-19 Lockdown Period in 2020. **Materials and Methods:** This retrospective study was conducted in the Department of Forensic Medicine, Govt. Medical College, Kottayam. The study data was collected from postmortem reports of Department of Forensic Medicine, Govt. Medical College, Kottayam. Pre-lockdown period was taken as from 21 March to 31 May 2019. There were total 424 cases in 2019, whereas in the Lockdown period taken as from 21 March 2020 to 31 May 2020, no. of cases reduced to 270. All these cases were grouped according to cause of death, manner of death and modalities of natural and unnatural deaths. Details of cases were entered utilizing a proforma. **Results:** There were total 424 cases in the pre-lockdown period in the year 2019, whereas in the lockdown period in 2020, number of cases declined to 270. Among the manner of deaths, accidents accounted for most of the deaths in the year 2019, i.e. 44.6% deaths due to accidents, whereas in the year 2020, deaths due to natural diseases topped the list, 46.3%. These differences in the manner of deaths were found statistically significant. **Conclusion:** Two months into lockdown, statistically significant differences were noted in patterns of deaths. Further study should be conducted in the near future, when more data will become available. Providing early warning in patterns of mortality within the community could prove to be an invaluable public health asset.

Key words: COVID 19; Lockdown; Autopsy cases; Pandemic; Central Kerala

INTRODUCTION

Death is a tragedy in whatever form, at whatever time and in whatever way it comes.¹ Many studies utilize the Framingham Heart Study's definition under which sudden deaths are considered to occur within one hour of the onset of terminal symptoms in an apparently healthy subject or whose disease was not so severe enough to predict an abrupt outcome. Sudden or unexpected death occurs from unnatural causes,

as well as from natural causes.² The death is natural when it is due to any pathology (disease) or ageing, and is unnatural when caused prematurely against the order of nature by injury, poison or other means of violence.³ Unnatural death, as defined under section 174 of the Code of Criminal Procedure, 1973, is that a person has committed suicide, or has been killed by another, or by an animal, or by a machinery or an accident or the person has died under circumstances raising a reasonable suspicion that some other person

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has committed an offence.⁴ The data of unnatural deaths may reflect the law and order situation in a particular area of jurisdiction.⁵ A total of 151,113 people were killed in 480,652 through road accidents across India in 2019, an average of 414 a day or 17 an hour, according to a report by the transport research wing of the Ministry of Road transport and Highways. India continues to have the largest number of road fatalities in the world. Kerala ranked at the fourth position with 41111 cases.⁶ India reported about 381 suicides daily for the year 2019, marking an increase of nearly 3.4% suicide deaths as compared to 2018.⁷ When it comes to the total Indian Penal Code (IPC) and Special and Local Laws (SLL) crimes' cognizable rate, Kerala (1463.2) is the state with the highest crime rate, followed by the capital Delhi (1342.5).⁸ But after lockdown due to COVID-19 pandemic, there is a sharp decrease in suicide, homicide and road traffic accidents along with increase of natural deaths.

Aims and Objectives

The current study has made an attempt to study the pattern of death during the pre-lockdown period and COVID 19 lockdown period to determine and compare the trend in natural and unnatural deaths. Drawing public attention and awareness towards casualties is important to prevent unnatural deaths; this possibly could reduce the incidence of such cases.⁹

MATERIALS AND METHODS

This retrospective study was conducted in the Department of Forensic Medicine, Govt. Medical College, Kottayam. The study data was collected from postmortem reports of Department of Forensic Medicine, Govt. Medical College, Kottayam. Pre-lockdown period was taken as from 21 March to 31 May 2019. There were total 424 cases during this period. Lockdown period, as from 21 March 2020 to 31 May 2020, witnessed a dip in the number of cases to 270. All these cases were grouped according to cause of death, manner of death and modalities of natural and unnatural deaths. All cases were entered into a proforma. All cases of natural and unnatural deaths brought to the department of Forensic Medicine were included in the study. These cases were subjected to a Covid 19 test before conducting the autopsy. Confirmed Covid positive cases, in which manner of death was natural and the cause of death undisputed were not undertaken for the same. Covid 19 positive suicides, accidents and homicides were carried out with extreme caution observing universal work precautions

Statistical Analysis

Categorical variables were expressed as frequency (percentage). Chi-square test was used to find association of pattern of death with period. For all statistical interpretations, $p < 0.05$ was considered the threshold for statistical significance. Statistical analyses was performed by using a statistical software package SPSS, version 20.0

RESULTS

There were a total of 424 cases in the pre-lockdown period in the year 2019. Out of these 424 cases, 71.9% constituted males (305) and the remaining 119 females, whereas in the lockdown period in 2020, number of cases phenomenally decreased to 270, that included 195 males (72.2%) and 75 females.

Accidental deaths which accounted for most of the deaths in pre lockdown period in 2019 (Table 1) went backstage during the lockdown period in 2020.

A comparison among the different causes of accidental deaths, showed a decreasing trend in road traffic accidents during the lockdown period (Figure 1), though this was not statistically significant.

Suicidal deaths showed no significant changes in patterns. This was the same case with homicides too (Table 2). Among suicidal deaths, hanging topped the list in both years followed by poisoning. Burns and other methods of suicide namely drowning, and self-inflicted cuts occurred subsequently.

Regarding the natural manner of deaths, cardiovascular (CVS) causes accounted for most of the deaths in periods, 60.6% in 2019 and 68% in 2020. Respiratory causes came second (12%) and neurological cause related deaths which were around 7% in 2019 came down to 4% in 2020. Other causes included deaths due to gastrointestinal pathologies and those deaths in which a definite opinion could not be established after the autopsy, requiring further laboratory and chemical analysis for the same. These accounted for 20.2% in the year 2019 and 16% in the year 2020. These differences were not however statistically significant.

Among road traffic accidents occupant injuries stood first in both periods, whereas pedestrian injuries contributed to less than half in both pre-lockdown and lockdown periods. Again, these were not statistically significant.

Table 1: Comparison of manner of deaths based on period

Manner	Pre-lockdown Period		COVID 19 Lockdown Period		χ^2	p
	Count	Percent	Count	Percent		
Natural	99	23.3	125	46.3	45.84**	p<0.01
Accidental	189	44.6	71	26.3		
Suicide	130	30.7	66	24.4		
Homicide	6	1.4	8	3.0		

** : - Significant at 0.01 level

Table 2: Comparison of homicide based on period

Homicide	Pre-lockdown Period		COVID 19 Lockdown Period		χ^2	p
	Count	Percent	Count	Percent		
Blunt trauma	4	66.7	7	87.5	0.88	0.347
Sharp trauma	2	33.3	1	12.5		

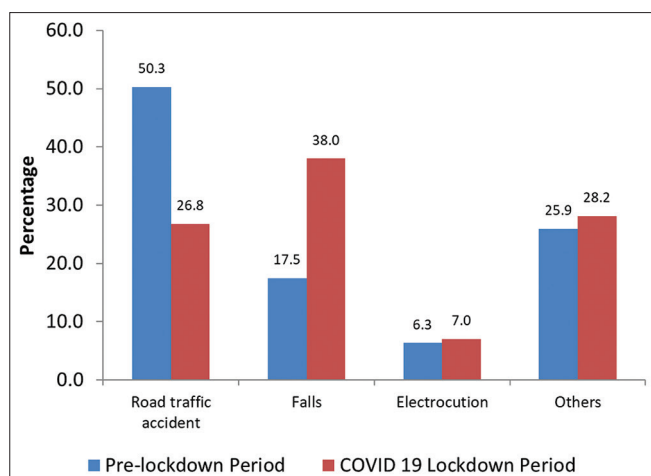


Figure 1: Comparison of accidental deaths based on period

DISCUSSION

Covid 19 was declared a pandemic by the WHO in December 2019. The spread of the virus worldwide evolved quite rapidly. It was hypothesized that COVID-19 outbreak would have an impact on patient with co- morbidities such as cardiovascular diseases.¹⁰

There was a significant drop in the number of cases being admitted in health care facilities for causes other than covid infection. Literature suggests delays in the treatment of patients presenting with myocardial infarction (MI) during the pandemic, as a cause for increased mortality.¹¹ As to the place of death, we hypothesize that many patients would be reluctant to visit a hospital during the outbreak, thus leading to an increase in out-of-hospital deaths.¹¹ Our analysis confirmed statistically significant differences as regards deaths due to natural causes in lockdown and pre lockdown era.

Comparing the two scenarios, we clearly understand that the number of cases in 2020 were drastically reduced to just a bit more than half of the cases in 2019. Accidental causes which were the leading cause of death in 2019 came second to natural causes in the year 2020. The reason most significantly attributable for this decrease might be the indirect impact of lockdown during the period from March to May 2020. This period interestingly, coincides with school summer vacations and a plethora of religious festivals where human mobility and transportation are at a peak. Naturally when there is a drastically reduced movement of people and vehicles in the entire nation, road accidents will then take a backseat.

Another reason might be peoples’ apprehension of going to hospitals out of a fear of getting infected with Covid -19. Cardiovascular cases accounted for the maximum, out of the people who died due to natural diseases. Among the cardiac causes, cardiac tamponade topped the list, arising as a complication of myocardial infarction. This implies that an early medical intervention for uneasiness due to myocardial ischemic injury could have probably prevented the evolution of a full-scale infarction leading to cardiac rupture and tamponade.

Suicides showed no significant statistical difference and were almost equal during pre-lockdown and lockdown periods. Isolation and quarantine (more extreme forms of social distancing) during the outbreak could have precipitated depression and anxiety.¹² Similar effects would be seen as confined people are detached from their loved ones, deprived of personal liberties, and devoid of purpose owing to altered routine and livelihood.¹³ This can contribute to frustration, boredom, low mood, and depression. Anxiety might arise from

fear of contagion and inadequate clarity around social distancing guidelines, often made worse by less reliable media sources heightening a state of confusion and fear mongering.¹⁴ Those with pre-existing mental illness might suffer from limited interpersonal interactions that are central to their management, as well as reduced access to helpful but “non-essential” (and thus often cancelled) psychiatric services. Additionally another factor contributing to suicides may be the loss of wages during the lockdown period precipitating economic crises in households.

A slight increase in homicides during the lockdown period may be linked to the venting of pent-up frustration imposed by the sudden control over the freedom of movement and employment.

Road traffic accidents showed statistically significant decrease in 2020 lockdown period due to the virtually nil traffic on roads during lockdown days. Ostensibly, it is this congestion and explosion in vehicular traffic that contributes to an alarming rise in road fatalities. Accidental falls increasing during lockdown period could have been due to people attempting activities not accustomed to. There were several instances of accidental falls from trees, while climbing to pluck mangoes or jackfruits, which are seasonal fruits in Kerala during this lockdown period. Moreover, a clamor for opting for homegrown products in the face of severely restricted visits to shops and stores could also account for the same.

CONCLUSION

The severity of the COVID-19 outbreak is the greatest public health threat caused by a respiratory virus since 1918.¹⁵ Two months into lockdown, statistically significant differences were noted in patterns of deaths. Further study should be conducted in the near future, when more data will become available. Further research into mortality trends for the specific time in question, might help answer whether the pandemic caused any changes in mortality patterns overall. By providing early warning in patterns of mortality within the community, can prove to be yet another invaluable public health asset in decision and policy making.

Coming to mental health scenarios during a pandemic, mitigating mental health effects requires a concerted effort from the public, policy makers, and healthcare professionals. Government, media, and healthcare professionals should communicate clear and accurate

public health information and guidance. Health care workers could remotely monitor people at risk to provide additional support.

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