

## Original Research Article

# Comparison of road traffic accidents presenting to the emergency department of a teaching hospital before and during lockdown

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## ABSTRACT

**Background:** Road traffic accidents (RTAs) are a major cause of misery, disability and death globally, with a disproportionate number occurring in developing countries. With COVID-19 reaching pandemic proportion, a nationwide lockdown was announced on 24 March 2020 which resulted in the complete closure vehicular movement. This study aimed to assess the impact of lockdown on the number of RTAs brought to our rural tertiary care teaching hospital situated on National highway number 65.

**Methods:** Medico-legal records were reviewed retrospectively at Kamineni institute of medical sciences hospital. The cases were classified into two groups. The pre-lockdown group included cases reporting to casualty from 1 April 2019 to 31 July 2019. The lockdown group included cases reporting to casualty from 1 April 2020 to 31 July 2020. Patient demographics, type of injury, time of injury, mode of injury were collected for all cases and analysed using simple mathematical tools.

**Results:** There was a significant decrease in the total number of RTAs during lockdown phases 1 and 2 and during unlocking phases 1 and 2 by 52.1%. Bike skid was the most common mode of injury. The highest number of RTAs was observed between 6 am to 6 pm and the most commonly affected gender was male especially in the age group of 15-45 years.

**Conclusions:** RTA numbers can be reduced by strict implementation of traffic rules and better road infrastructure. One positive effect of the measures implemented to control the spread of COVID-19 was the reduction of traffic accidents and mass casualties.

**Keywords:** Road traffic accidents, RTA, Lockdown

## INTRODUCTION

RTAs are a major cause of misery, disability and death globally, with a disproportionate number occurring in developing countries.<sup>1</sup> An RTA can be defined as an event that occurs on a way or street open to public traffic, resulting in one or more persons being injured or killed, where at least one moving vehicle is involved. Thus, RTA is a collision between vehicles; between vehicles and

pedestrians; between vehicles and animals or between vehicles and geographical or architectural obstacles. RTAs are a human tragedy. They involve high human suffering and socioeconomic costs in terms of premature deaths, injuries, loss of productivity and so on.<sup>2</sup>

The first case of COVID-19 was reported in India on 30 January 2020. The WHO declared the COVID-19 outbreak as a global pandemic on 11 March 2020.<sup>3</sup>

With COVID-19 reaching pandemic proportion, epidemic disease act, 1897 was invoked by the government of India and a nationwide lockdown was announced on 24 March 2020 which resulted in the complete closure of highways, non-essential vehicular movement and all day-to-day life activities. A complete curfew was imposed between 7 pm to 7 am.<sup>4</sup>

With the majority of people working from home, reduced tours and travel, RTAs were still being reported across the nation.

According to the journal of emergency dispatch, the mechanism of injury describes how, with what force and on which part of the body the patient was injured. Significant mechanisms of injury include ejection from the vehicle, vehicle versus pedestrian or cyclist, high-speed accidents, long and extreme falls, large machinery accidents and many other forces including intentional ones.<sup>5</sup>

A mass casualty incident (MCI) is defined as an event that overwhelms the local healthcare system, where the number of casualties vastly exceeds the local resources and capabilities in a short period. Any MCI can rapidly exhaust available resources for not only the MCI but the normal day-to-day tasks of the hospital. Each hospital should institute a surge plan in preparation for anticipated, progressive, insidious (notice events) and sudden-onset (no-notice events) disasters occurring within the community.<sup>6</sup>

This study aimed to assess the impact of lockdown on the number of RTAs brought to our rural tertiary care teaching hospital situated on National highway 65.

## METHODS

A record based, retrospective, analytical study was conducted using medico-legal case records in Kamineni institute of medical sciences hospital for 4 months (1 April 2020 to 31 of July 2020). This was compared to the same period during 2019.

Data was organized into two groups; the first group was termed the pre-lockdown period (1 of April to 31 of July 2019) and the 2nd group was termed lockdown period (1 of April to 31 of July 2020). Patient demographics, type of injury, time of injury, mode of injury.

### *Inclusion criteria*

MLC records of RTAs during 1 of April to 31 of July 2019 and during 1 of April to 31 of July 2020 in Kamineni institute of medical sciences hospital, Narketpally were included in the study.

### *Exclusion criteria*

MLC records of RTAs not pertaining to the period mentioned in inclusion criteria above were excluded.

### *Study tool*

The RTAs in each group were collected and entered into an excel sheet and analysed using simple mathematical tools.

## RESULTS

The number of RTAs reduced by 52.1% compared to a similar period during the previous year.

The monthly comparison of RTAs between pre-lockdown and lockdown groups is displayed in Table 1. In the year 2020, the month of April showed a drastic reduction in the number of cases, 82.2% (N=191).

Comparison of RTAs among various age groups showed that 16-45 years was the most common age group both in pre-lockdown and lockdown period. The result showed that the people in the most active and productive age group were more prone to accidents.

The male to female ratio in pre lockdown group was 1.3:1. This was in contrast to accidents reported in the lockdown group (3:1) indicating that more males were road users during the lockdown (Figure 1 and 2).

The number of accidents reported between 6 am to 6 pm (298) and 6 pm to 6 am (302) together was almost the same during the pre-lockdown. However, there was a significant decrease of (42.8%) in the RTAs reported between 6 pm-6 am (99) during lockdown which could be attributed to night curfew (Figure 3).

A comparison of the mode of the accidents indicated that 2 wheelers were responsible to 41.8% RTAs in 2019 and 63.4% RTAs in 2020 (Table 2). Among these, bike skid was the most common mode in the pre-lockdown and lockdown periods and even an increase of 28.6% was noted during the lockdown period (Figure 4).

The most common type of injury was reported as simple injury both during the pre-lockdown and lockdown periods (Figure 5).

Personal vehicles were used to transport victims to the hospital both during the pre-lockdown and lockdown periods (Figure 6).

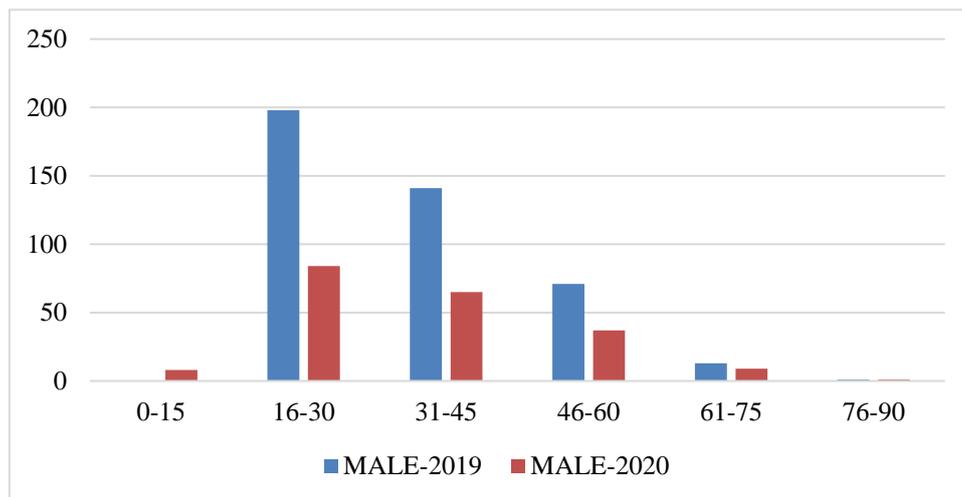
The number of mass casualties was significantly high during 2019 compared to during 2020 (Figure 7).

**Table 1: Month wise comparison of RTAs.**

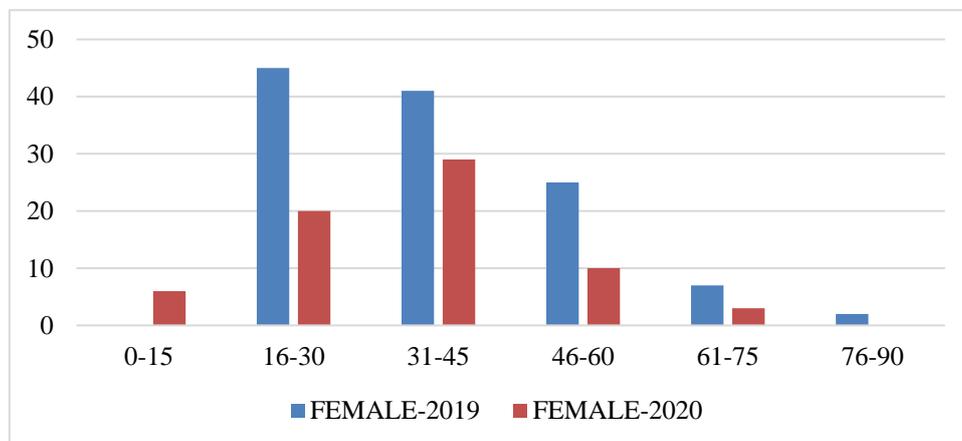
Month	2019	2020	Difference
	N (%)	N (%)	
April	191 (31.8)	34 (11.8)	-82.2
May	184 (30.6)	79 (27.5)	-57.3
June	114 (19)	119 (41.4)	+4.38
July	111 (18.5)	55 (19.1)	-50.45
Total	600	287	

**Table 2: Comparison of mode of injury.**

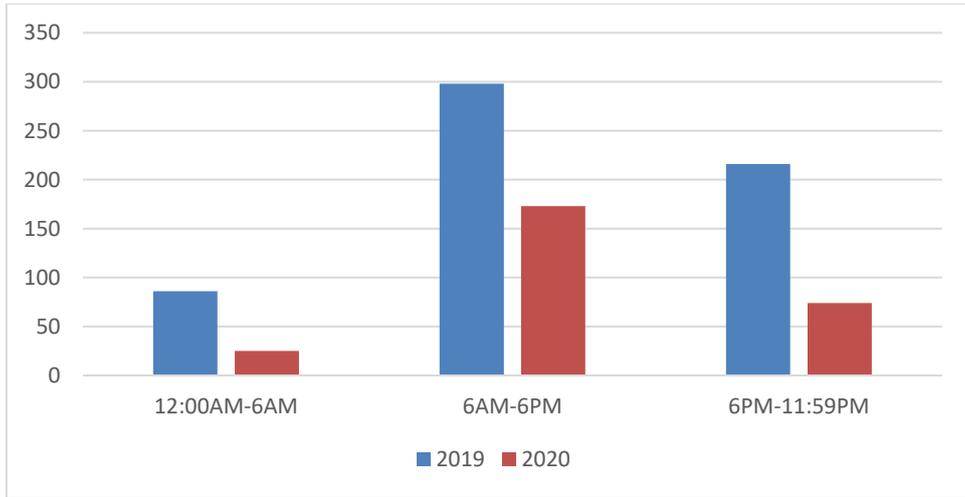
Comparison	2019 (N=600)	2020 (N=287)
Bike skid	167 (27.8%)	162 (56.4%)
Bike versus bike	57	13
Bike versus car	27	7
Car versus car	12	1
Car versus lorry	25	NIL
Hit the divider	9	4
Other	Nil	103
Auto versus DCM	10	NIL
Fall from tractor	Nil	3



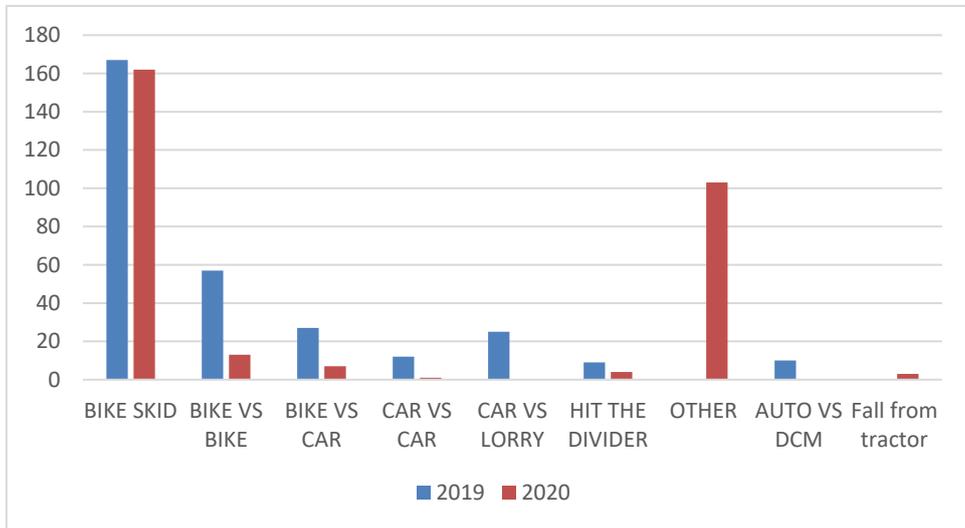
**Figure 1: Male distribution.**



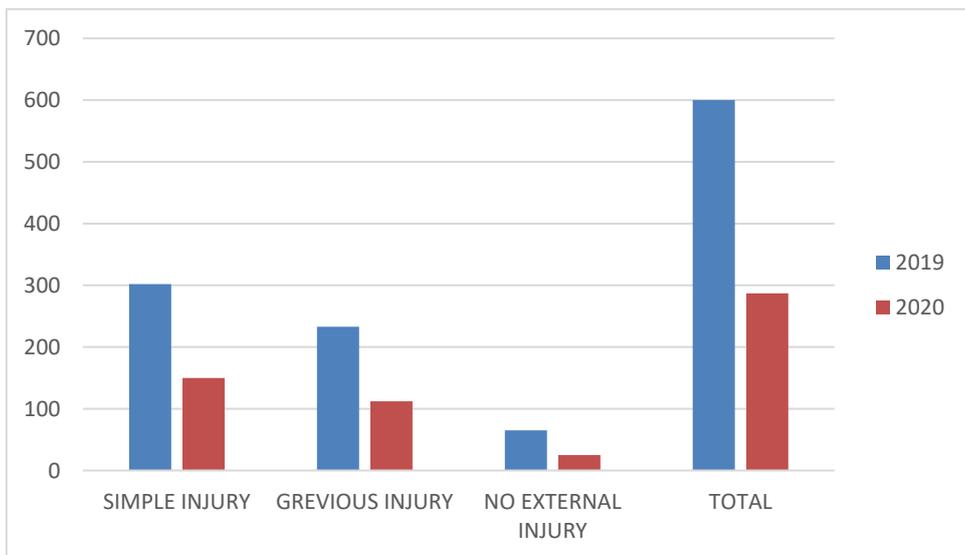
**Figure 2: Female distribution.**



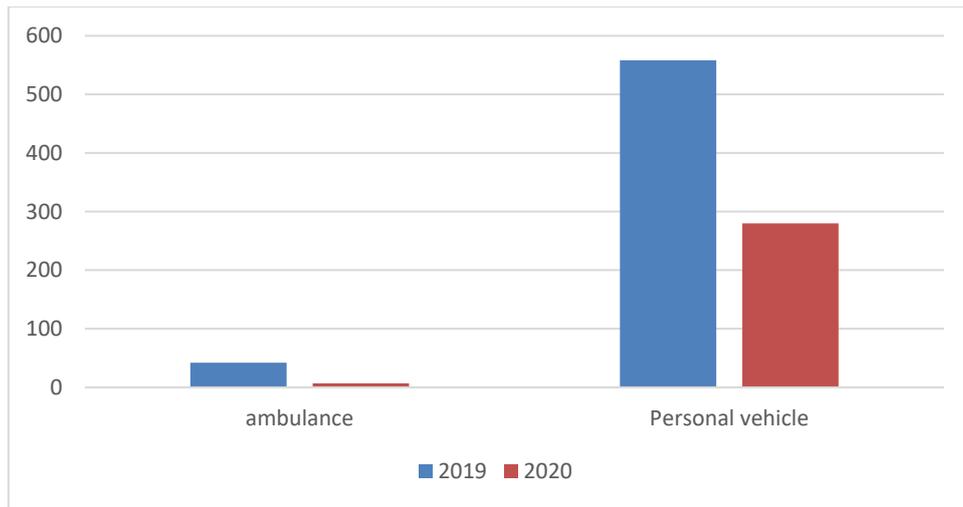
**Figure 3: Time of injury.**



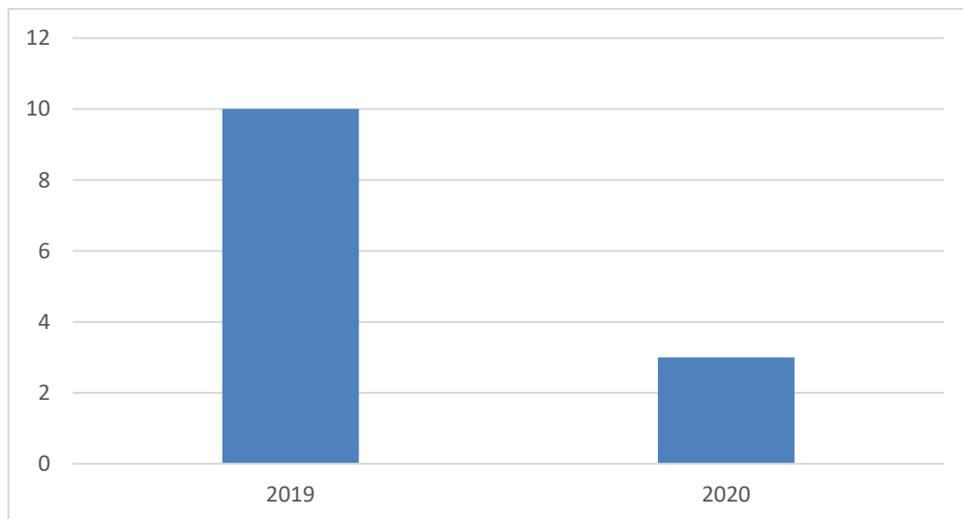
**Figure 4: Mode of injury.**



**Figure 5: Type of injury.**



**Figure 6: Mode of transport to hospital.**



**Figure 7: Mass casualties.**

## DISCUSSION

The pre-lockdown group showed the highest accidents in April whereas the lockdown group showed the highest number in June with the beginning of the unlocking phase.

A study done by Ruikar et al showed that RTA was the major cause of injuries in age group 15-29.<sup>2</sup> Our study also showed similar results and that the age group of 16-30 years was the highest affected followed by the age group of 31-45 years, both before and during lockdown. Similar results were also obtained by Trangadia et al, Hussaini et al and Yadav et al.<sup>7,8,10</sup>

The ratio between males and females met with an accident in 2019-2020, was 1.3:1 in 2019 which was high in 2020 which was 3:1. Our findings were consistent with

the study conducted by Trangadia et al (males 72.77%), Hussaini et al (males 74.03%) and Yatoo et al (males 74.03%).<sup>7-9</sup>

During the nationwide lockdown, the central and all state governments ordered the closure of all activities except essential services. All vehicular movement, construction work, industries remained closed. People were allowed to go outside their homes within a 3 km radius, only to buy food and other essentials. A total curfew was imposed daily between 7 pm and 7 am.<sup>10</sup>

The highest number of RTAs was seen between 6 am and 6 pm and the most common mode of injury was bike skid. Maryada et al reported similar findings.<sup>11</sup>

In our study, simple injury was the most common type of injury both during the pre-lockdown and lockdown

period. A study conducted in Tarragona province of Spain showed results consistent with our study.<sup>12</sup>

The most common mode of transport of victims to the hospital was by private vehicle. Algerian et al reported the same in their study.<sup>13</sup> In contrast, Amiri et al reported emergency medical services (EMS) ambulance as the most common mode of transport of victims to the hospital.<sup>14</sup>

Our study showed a drastic reduction in mass casualty incidents during the lockdown period.

## CONCLUSION

Although the COVID-19 pandemic has had a major impact on health, it has also affected numerous economic and social phenomena on an almost unprecedented scale. It has affected almost all facets of social life in addition to modifying our lifestyle and general behaviour. Mobility has been no exception in this respect. Even though mobility cannot be eliminated, RTAs can be reduced by strict implementation of traffic rules and better road infrastructure. One positive effect of the measures implemented to control the spread of COVID-19 was the reduction in the number of traffic accidents. There was a significant decrease in the number of road accidents during the lockdown and the cases started increasing with implementation of unlock 1 and 2 in the month of June 2020. Since the main road users belonged to young age group, the highest number of accidents were recorded among them. Males were most commonly involved in accidents in both pre and lockdown period. Most RTAs occurred between 6 am to 6 pm as vehicular movement was restricted due to night curfew. Bike skid was the most common mode of accident and the majority of victims were brought to the hospital by a personal vehicle, both during and pre lockdown. Since our hospital is situated on the busy Hyderabad-Vijayawada National highway 65, it is recommended that more ambulances should be made available, preferably every 25 kms for quick response and for early shifting of the patients to the hospital. The roads should be made free of loose gravel by utilizing road seeping machines and repairs should be concurrently done to reduce the number of bike skids. Strict implementation on the use of helmets and other protective equipment by riders on national highways is recommended.

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*Ethical approval: The study was approved by the Institutional Ethics Committee*

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