Short Communication

Comparison of Burden of Injury at a Tertiary Care Centre of National Importance: Pre-COVID-19 and COVID-19 Era

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Abstract

During the COVID-19 pandemic, precautionary guidelines to shut down non-essential services had an impact on the pattern of hospital trauma admissions. We compared the trauma cases handled in our hospital from 24th March 2020 to 30th November 2020 during the restricted movement period with statistics from 2019. The objectives of this study is to assess the prevalence of trauma during lockdown and restricted movement phase of COVID-19 pandemic and to analyze the epidemiology factor associated with trauma in pre COVID-19 and COVID-19 era in a tertiary care hospital of National importance in central India. This retrospective record-based study was done to analyze the profile of injured trauma patients presented to trauma and emergency center of tertiary care center of national importance from March 24 to June 30, 2020 (lockdown phase) and 1st July to 30th November (post-lockdown phase) of 2020. Results were compared with data from the year 2019. Total 621 trauma patients were managed during various restricted phases of the COVID-19 pandemic (March 2020 - November 2020). Out of which 128 admissions were in the strict lockdown phase (March-May 2020) while 493 presented after lockdown during the restricted movement phase. Both during and after a strict lockdown, road traffic accidents are significantly reduced. In contrast, assaults and household injuries were significantly higher. During the post-lockdown phase of 2020, self-falls increased significantly in both phases compared to the year 2019. There was a significant decrease in trauma admissions in lockdown phase due to decreased vehicular accident but increase in household injury due increased activities inside home. To determine the readiness to deal with future situations similar to these, we look at the behavioral changes in our patient population during the COVID-19 pandemic.

Keywords: COVID-19, injury, pandemic, trauma trends

Introduction

Following the World Health Organization's declaration that COVID-19 could be a global pandemic, India banned non-residents Indians and non-Indian citizens arrival in India from 20 March 2020.[1-3] As a further measure to slow infection spread, Indian governments implemented lockdowns accompanied by social distance measures. The closure of social gathering places like clubs, entertainment venues and dine-in restaurants began at mid-day on 24 March 2020. Restrictions on gatherings of up to ten people were lifted on 15 May. This allowed cafes and restaurants to re-open for sit-in dining and many non-essential industries to resume work. Time spent at home, on transportation and at work changed dramatically during the 2-month lockdown as non-essential industries shut down or adopted work-from-home policies.[4-6] As non-essential industries adopted work-from-home policies or shut down, time spent at home, on transportation and at work changed dramatically.

During any given period of time, physical trauma imposes a significant burden on the healthcare system. In tertiary care hospitals, trauma is influenced by various factors, including geography, population size, economy, weather and social factors. Different patterns are observed in different regions based on their unique characteristics. Trauma admissions can

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be affected by major disasters like the COVID-19 pandemic. The guidelines implemented to control the event may change the volume and pattern of admissions. Managing trauma along with COVID-19 patients in tertiary care hospitals was a unique challenge during the COVID-19 pandemic since there was no clear picture of how the pandemic would affect resource utilisation and staffing during the outbreak. Several studies have shown an alteration in the distribution of acute trauma presentations as a result.[7-10] Our institution is a tertiary care centre of national importance located in the capital city of a tribal state of central India. The capital city's population is about 11,23,558, while the state is about 28 million. We reviewed the trauma cases managed in our hospital from 24 March 2020 to 30 November 2020 during the restricted movement period and compared them with statistics of 2019. This study aimed to analyse the change in the pattern of acute injuries during the COVID-19 lockdown and restricted movement period compared to the pre-lockdown phase reported in our tertiary care centre. As the COVID-19 pandemic affected multiple aspects of our lives, we looked at its impact on the volume and pattern of trauma cases reported to our tertiary care hospital.

Methodology

Study design

This was a record-based cross-sectional study carried out at tertiary care centre of national importance.

Study population

The hospital records of injured patients who attended the trauma and emergency department of the institution from 24 March 2020 to 31 May 2020 (lockdown phase) and six months post-lockdown (restricted movement phase) from 1 June 2020 to 30 November 2020 were studied. For comparison, 2019 data for the same duration were considered. The data of injured patients treated in trauma and emergency department during the study period were compiled from available hospital records.

Data collection and analysis

We reviewed the patient's demographics, reason for admission and injuries and compared it with the previous year data of the same duration. Data entry and editing were accomplished in Microsoft Excel and later exported into IBM SPSS version 20 for analysis. The categorical variables are analysed and presented in the form of descriptive statistics such as frequencies and percentages, while quantitative variables are presented as mean and standard deviation. The student *t*-test was applied for the comparison of data. The *P* value <0.05 was considered statistically significant.

This study protocol received ethical approval from the Institutional Ethical Committee of All India Institute of Medical Sciences, Raipur (Letter no. 531/IEC-AIIMSRPR/2021 dated 12/03/2021)

Observation and Results

Totally, 621 trauma patients were managed during various restricted phases of the COVID-19 pandemic (March 2020–November 2020). Out of these, 128 admissions were in the strict lockdown phase (March–May 2020), while 493 were presented after lockdown during the restricted movement phase. This data is compared with the previous year (2019) data during the same period.

As shown in [Figures 1 and 2], data shows young adults (19-40 years age group) are more involved in both the phases i.e., Strict lockdown and restricted movement phase (57.8% & 64.9% respectively). Similarly, more number of males are involved as compared to females (84.4% & 86.8% respectively).

In both the phases of lockdown, there is increase in head injury cases, followed by upper and lower limb injuries as compared to the previous year data. Surprisingly, the head injuries cases (53.12% and 48.68%) are high in both the phases of lockdown, that is strict lockdown phase and restricted movement phase, respectively.

Table 1 depicts that there is no significant difference in age and gender distribution between 2019 and 2020. Maximum trauma patients belong to 19-40 years of age group, followed by the middle age group (41-60 years). Road traffic accidents are significantly reduced during a strict lockdown (p=*0.0001) as well as during the post-lockdown period (p=<0.0001). During the strict lockdown phase, assaults (p=0.029) and household

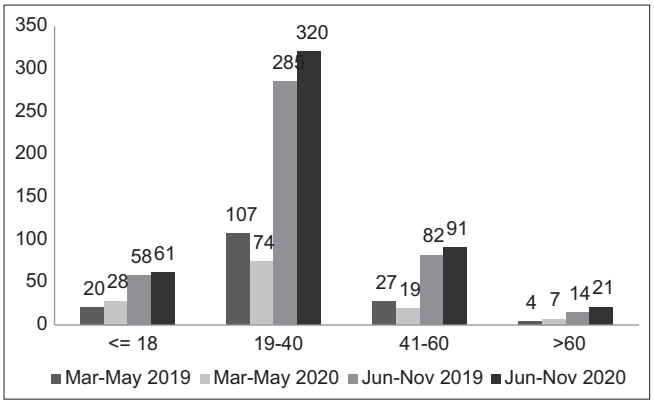

Figure 1: Age distribution of burden of injury

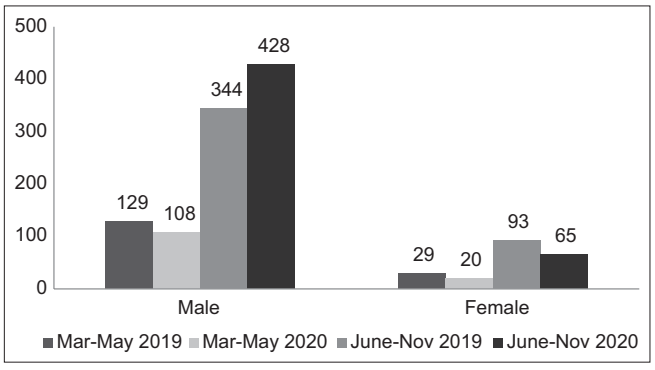

Figure 2: Gender distribution of burden of injury

Table 1: Comparison of 2019–2020 data: Type of accidents

Variables	March–May			June–November		
	2019	2020	p-value	2019	2020	p-value
Age group						
⩽18	20 (12.6)	28 (21.8)	0.33	58 (13.5)	61 (12.4)	0.47
19–40	107 (67.7)	74 (57.8)	0.37	283 (64.7)	320 (64.9)	0.46
41–60	27 (17)	19 (14.8)	0.39	82 (18.7)	91 (18.4)	0.46
>60	4 (2.5)	7 (5.4)	0.37	14 (3.1)	21 (4.3)	0.28
Gender						
Male	129 (81.6)	108 (84.4)	0.41	344 (78.7)	428 (86.8)	0.40
Female	29 (18.4)	20 (15.6)	0.30	93 (21.3)	65 (13.2)	0.28
Type of Accident						
RTA	117 (74.1)	69 (53.9)	<0.0001	319 (73)	303 (61.5)	<0.0001
Assault	10 (6.3)	18 (14.1)	0.029	55 (12.6)	65 (13.2)	0.78
Electrocution	2 (1.3)	1 (0.8)	0.68	9 (2.1)	0 (0)	0.001
Fall from height	8 (5.1)	3 (2.3)	0.23	12 (2.7)	20 (4.1)	0.27
Household injury	3 (1.9)	10 (7.8)	0.01	10 (2.3)	17 (3.4)	0.29
Self-fall	5 (3.2)	16 (12.5)	0.003	6 (1.4)	44 (8.9)	<0.0001
Self-harm	6 (3.8)	4 (3.1)	0.75	13 (3.0)	11 (2.2)	0.47
Workplace injury	7 (4.4)	7 (5.5)	0.68	13 (3.0)	33 (6.7)	0.009
Total	158	128	0.39	437	493	0.44

(Student t-test applied to compare burden of injuries in pre-COVID-19 and COVID-19 era. P-value <0.05 is considered significant, while <0.01 and <0.001 are considered highly significant (HS) and very highly significant (VHS).)

injuries (p=0.01) are considerably higher. The rate of self-falls in the year 2020 increased in both phases compared to year 2019 (p=0.003 & p=*0.0001). There is also a significant increase in workplace injuries (p=0.009) during the post-lockdown phase of 2020.

Discussion

In the present study, we found that during the first phase of strict lockdown of COVID-19 pandemic our trauma centre reported a smaller number of patients, whereas during the restricted phase of June–November 2020 there was an increase in overall numbers of admissions. The similar trends are seen in studies conducted by Kreis C. A. *et al*., Hazra D. *et al*., Christey G *et al*. and Van Aert G *et al*.[11-14] The majority share of trauma was of road traffic injuries with maximum patients belong to the age group of 19 years to 40 years, both during pre-COVID-19 and COVID-19 era, but the admissions were reduced by 20% (i.e. from 74% to 53%) and 11% (i.e. from 73% to 61.5%) during complete lockdown and post-lockdown phase of COVID-19 pandemic. Findings are consistent with the experience of other centres of the world as mentioned by studies by Jacob S *et al*. and Nia A *et al*.[8,15] In India, the adult age group lies in the most active phase of life and risky riding behaviour in the young population due to several factors like reckless driving, non-adherence of traffic rules, triple riding two-wheelers and non-adherence to safety norms that are responsible for it. The cases of physical assault rise from 6.3% to 14.1% due to a combination of external stress, pandemic-induced unemployment, and the lack of external outlets to release aggression during the strict lockdown phase leads to an increase in violence-related crimes, either domestically or in neighbourhood scuffles. It was in contrast with studies by the western part of the world where self-inflicted penetrating injuries were more as compared to interpersonal violence.[16] Physical injuries resulting from thefts and assaults or interpersonal conflicts were the main cause of trauma admissions during the post-lockdown phase of restricted movement, but it shows a marginal rise as compared to the previous year data. A total of four cases of domestic violence were reported to our emergency department during the lockdown period, with an unknown number of unreported cases. As compared to our study, Mazza, M *et al*.[17] commented on increasing domestic violence, suggesting that mental stress, social isolation, narrowness, and fear are contributing factors.

Conclusion and Recommendations

Our tertiary care trauma centre in central India reported a change in injury patterns and admission trends following the guidelines implemented to curb the COVID-19 outbreak. Traffic injuries decreased briefly before returning to the convention, while household injuries increased. Trauma centres should prioritise maintaining access to changing patterns during these times. Assessing the readiness to handle future situations similar to these is crucial to addressing behavioural changes among our population.

A single institution may not represent a state-wide, national, or global population, limiting the scope of our study. Several studies across multiple institutions within a community in different regions would be necessary to better characterise COVID-19's impact.

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Conflicts of interest
There are no conflicts of interest.

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