

# A Cross-Sectional Analytical Study to Assess the Impact of Coronavirus Disease and Lockdown Over the Changes in the Spectrum of Surgical Patients Hospitalizations in the Department of General Surgery at M.Y. Hospital, Indore

Vaibhav Shrivastava<sup>1</sup>, Manish Kaushal<sup>2</sup>, Shashank Singh Baghel<sup>3</sup>, Pavan More<sup>3</sup>, Jitendra Rawat<sup>3</sup>, Jitendra Yadav<sup>3</sup>, Harshita Kakoriya<sup>3</sup>, Shubham Goyal<sup>3</sup>

<sup>1</sup>Associate Professor, Department of Surgery, Mahatma Gandhi Memorial Medical College, Indore, Madhya Pradesh, India, <sup>2</sup>Professor, Department of Surgery, Mahatma Gandhi Memorial Medical College, Indore, Madhya Pradesh, India, <sup>3</sup>Junior Resident, Department of Surgery, Mahatma Gandhi Memorial Medical College, Indore, Madhya Pradesh, India

## Abstract

**Background:** A lot of areas of society have got affected due to coronavirus disease 2019 (COVID-19) pandemic and lockdown. This has also resulted in various changes in the types of patients getting admitted in hospitals for surgical care. We have assessed the changes in the types of patients getting admitted in the Department of General Surgery at MGM Medical College, Indore.

**Methods:** The study period was divided into two groups. Group A consisting of 585 patients admissions between March 25, 2019, and April 14, 2019, taken as non-COVID/non-lockdown period; Group B consisting of 76 admissions between March 25, 2020, and April 14, 2019, taken as COVID/lockdown. Both groups were studied for the various causes of admissions and the results were analyzed using SPSS.

**Results:** There was a significant reduction in the number of patients admitted during the COVID/lockdown phase as compared to the lockdown phase. The total number of trauma patients significantly dropped during the lockdown phase. The percentage of road traffic accident (RTA) cases also dropped significantly during the lockdown Phase 1.

**Conclusions:** COVID-19 and imposition of lockdown resulted in a significant number of admissions in general surgery. The study also revealed a major drop in the percentage of RTA patients getting admitted in the hospital during the lockdown.

**Key words:** Cancer, Coronavirus disease, Lockdown, Road traffic accident, Surgical emergencies and coronavirus disease, Trauma

## INTRODUCTION

The ongoing global coronavirus disease 2019 (COVID-19) pandemic that originated in China's Hubei Province with first case dated back to November 2019 was declared a Public

Health Emergency of International Concern on January 30, 2020. The COVID-19 pandemic has resulted in more than 62 million confirmed cases and over 1,453,000 deaths as per the WHO weekly operational update dated November 30, 2020.<sup>[1]</sup> This global pandemic has already affected almost all aspects of modern-day human life like sharp rise in unemployment, economic recession, global food crisis, collapse of tourism industry, and burden over the health-care system, but humankind needs to devise strategies to cope up with these afflictions in a way to accustom itself to the changes necessary and at the same time make sure that the routine works are not badly hampered. As evident from the history itself, it is expected that the world will eventually cop

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**Corresponding Author:** Dr. Shashank Singh Baghel, Department of Surgery, Mahatma Gandhi Memorial Medical College, Indore, Madhya Pradesh, India.

up with this crisis by the collaborative efforts but the acts and measures done during the crisis have a profound impact over the losses incurred during any crisis.

In an attempt to limit the spread of coronavirus and to limit the number of cases, thereby as an attempt to “Break the Chain of Transmission,” the Government of India on March 24, 2020, announced a Pan India lockdown, initially for a period of 21 days as Phase 1: March 25, 2020–April 14, 2020. The restrictions imposed included a ban on people from stepping out of their homes; all services and shops to remain closed except pharmacies, hospitals, banks, grocery shops, and other essential services; closure of commercial and private establishments with promotion of work from home; suspension of all educational, training, research institutions; closure of all places of worship; and suspension of all non-essential public and private transport along with prohibition of all social, political, sports, entertainment, academic, cultural, and religious activities.

This Pan India was further increased till May 31, 2020, through the next three lockdown phases, followed by the initiation of easing restriction with the announcement of Unlock 1.0 on May 30, 2020, with continued restrictions till June 30, 2020, for containment zones including Indore.

The imposition of Pan India COVID-19 lockdown resulted in imposition of strict lockdown at Indore by the divisional authorities of Indore for about 91 days in between March 25, 2020, and June 24, 2020. The lockdown resulted in restricted civilian movement within and outside the city.

## MATERIALS AND METHODS

### Study Design

This was an observational retrospective comparative cross-sectional study.

### Study Period

Retrospective data of 21 days between March 25, 2019, and April 14, 2019; and 21 days between March 25, 2020, and April 14, 2020.

### Funding

No specific funding was required.

### Study Size

All cases admitted to the Department of Surgery, M.Y. Hospital, Indore, between March 25, 2020, and April 14, 2020, and between March 25, 2019, and April 14, 2019.

### Study Population

All cases admitted in the Department of Surgery, M.Y. Hospital, Indore, during the period of March 25, 2020,

and April 14, 2020, and between March 25, 2019, and April 14, 2019.

### Case Definition

Patients admitted in the Department of Surgery, M.Y. Hospital between March 25, 2020, and April 14, 2020, and between March 25, 2019, and April 14, 2019.

### Inclusion Criteria

All patients aged 14 years and above admitted primarily in the department of surgery during the above-mentioned period.

### Exclusion Criteria

Patients not being admitted or being treated on outpatient department (OPD) basis. Patients below 14 years of age were excluded from the study.

An analytical cross-sectional study was conducted after the clearance from the Institutional Review Board. The study period was divided into two groups. Group A consisting of 585 patients admissions between March 25, 2019, and April 14, 2019, taken as non-COVID/non-lockdown period; Group B consisting of 76 admissions between March 25, 2020, and April 14, 2020, taken as COVID/lockdown. Both groups were studied for the various causes of admissions and the results were analyzed using SPSS, and  $P < 0.05$  was taken as statistically significant.

## RESULTS

The total number of patients admitted in Group A was 585 which reduced to just 76 patients admitted under Group B. Trauma was the most important cause for admission in both the groups as evident from Table 1 and Figure 1.

The distribution of specific modes of trauma among trauma patients admitted during both the phases. Road traffic accident (RTA) was the most common mode of trauma responsible for admission during both the phases but its number decreases from 170 cases during the non-lockdown phase of 2019 to just 17 during the lockdown 01 phase of 2020. The percentage of RTA cases fell from 70.54% during the non-lockdown phase to 36.96% during the lockdown 01 phase. The percentage of burn patients increased from 11.20% during the non-lockdown phase (2019) to 36.96% during the lockdown 1 phase (2020). The variation was found to be statistically significant, as shown in Table 2 and Figure 2.

## DISCUSSION

This cross-sectional study provides data and assessments on the impact of COVID-19 pandemic over the surgical

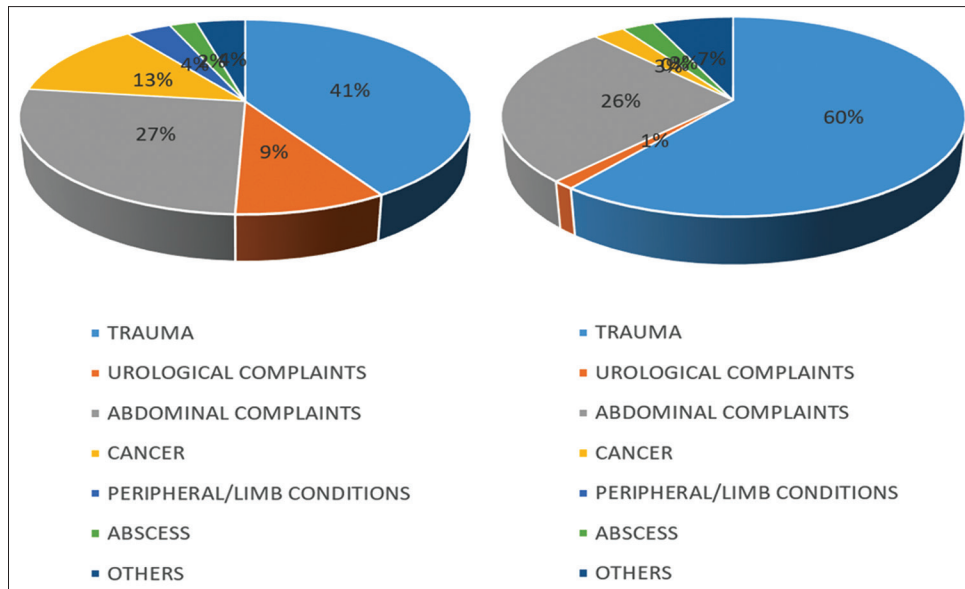


Figure 1: Disease-specific indication for admission during non-lockdown phase and lockdown 01 phase

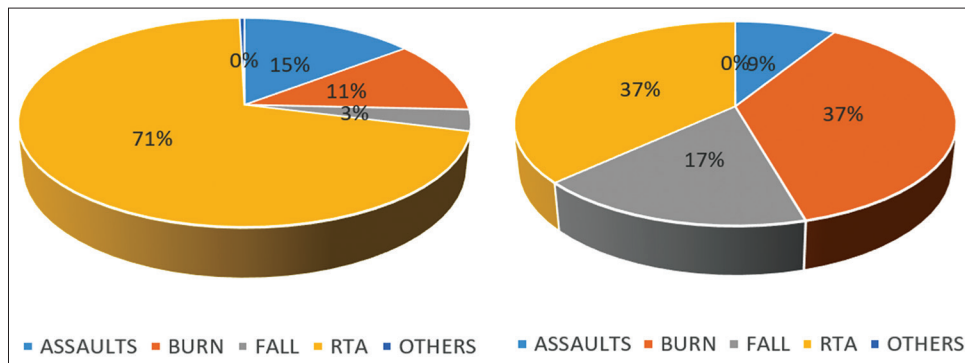


Figure 2: Distribution of trauma cases on the basis of mode of trauma during non-lockdown and lockdown 01 phase

**Table 1: Disease-specific reason for admission for patients admitted between March 25, 2019, and April 14, 2019 (non-lockdown period) and between March 25, 2020, and April 14, 2020 (during lockdown)**

Presenting complaint	Non-lockdown phase (2019) (%)	Lockdown 01 phase (2020) (%)	P-value
Trauma	241 (41.20)	46 (60.53)	0.002
Urological complaints	55 (9.40)	1 (1.31)	
Abdominal complaints	155 (26.50)	20 (26.31)	
Cancer	75 (12.82)	2 (2.63)	
Peripheral/limb conditions	22 (3.76)	0 (0)	
Abscess	13 (2.22)	2 (2.63)	
Others	24 (4.10)	5 (6.58)	
Total admissions	585	76	

**Table 2: Specific causes of trauma among trauma patients admitted between March 25, 2019, and April 14, 2019 (non-lockdown period) and between March 25, 2020, and April 14, 2020 (during lockdown).**

Cause of trauma	Non-lockdown phase (2019) (%)	Lockdown 01 phase (2020) (%)	P-value
Assaults	35 (14.52)	4 (8.69)	0.0001
Burn	27 (11.20)	17 (36.96)	
Fall	8 (3.32)	8 (17.40)	
Road traffic accident	170 (70.54)	17 (36.96)	
Others	1 (0.42)	0 (0)	
Total	241	46	

admissions in the Department of General Surgery at MGM Medical College, Indore. The total number of patients decreased during the COVID and lockdown Phase 1 due to various travel restrictions imposed by the government in the

mobility of general population, leading to reduced overall attendance of patients in the hospital OPDs. Further, the guideline issued by government to avoid visiting hospitals for trivial illnesses might have also reduced the number of admissions. The patients admitted during the lockdown period were mainly due to emergency indications.

The restriction of mobility can be translated in terms of reduced vehicles and humans on road, thereby reducing the number of RTAs happening over roads. The other causes of trauma like burn are mainly due to household accidents, and such accidents do continue to happen inside homes despite the outside restrictions due to lockdown. Lesser degree of burns might have been managed at lower levels of health care. The number of assault cases also decreased during the COVID and lockdown as human-to-human interactions were significantly reduced due to COVID-19 pandemic and the resulted lockdown.

The reduced number of surgical patients admitted also ensured the utilization of health-care resources and doctors toward the care of increasing number of COVID-19-positive patients.

A similar cross-sectional study conducted by Stöß, *et al.*<sup>[2]</sup> provided data and assessments on the impact of the COVID-19 pandemic on the work of non-academic departments of surgery in Germany during the first lockdown revealed almost half of the surgeons (43.9%) stated that the number of emergency operations had dropped on average by one third. The same number of surgeons reported no change in the number of emergency operations. The statement about surgical emergencies in the emergency room was even clearer. Almost two-thirds (63.5%) reported a decreased number of admissions. The recorded numbers indicate that patients might avoid attendance to the hospital even in urgent cases because they fear a COVID-19 infection.<sup>[3]</sup>

The lockdown in India resulted in decreased number of vehicles on road and thus resulted in decreased number of RTAs to an extent that it has been estimated that about 10,000 lives were saved in the month of April due to averted RTAs.<sup>[4]</sup> A study done at IMS-BHU, Varanasi, aimed at studying the magnitude of COVID-19 pandemic over the neurosurgical traumas and neurosurgical admissions including the data regarding neurosurgical emergency and elective surgeries revealed significant reduction in OPD attendance per day, reduced OPD admissions per day, and overall reduced total neurosurgical emergency and elective surgeries. The study further revealed an overall negative impact on the neurosurgical training program because of the COVID-19 pandemic and lockdown.<sup>[5]</sup> Another study conducted among the rural trauma at Wardha observed an overall fall in the number of trauma occurring during the lockdown. This study reported an overall reduction in the total number of cases by about 3 times where the statistics related to geriatric trauma remained largely unchanged, that is, 5–6% of the total rural society trauma. The drop in the incidence of high-velocity trauma was about 5 times during the lockdown

period. There was a proportional increase in the low-velocity trauma after the implementation of lockdown which increased from 42% of the total trauma before lockdown to 64% of the total trauma after lockdown, however, the total number of low-velocity trauma is still lower than the number of cases before lockdown. The decrease in the number of RTA-related injuries resulted in reduction in the proportion of high-velocity trauma from 52% to 31% after lockdown. The male-to-female ratio almost remained the same in the pre- and post-lockdown implementation comparison, which was roughly 3:1 in both the periods. The traumas were almost equal with regards to the part of body involved when studied for the involvement of lower body, upper body, upper limb or lower limb, or head-neck-face trauma before lockdown, but the proportion of traumas involving the head, neck, and face decreased significantly during the period of lockdown. The abdominal and thoracic trauma remained the same in the pre- and post-lockdown period. Unlike the decreased proportion of injuries involving the head, neck, and face; injuries involving the upper and the lower limb injuries have not shown such a decrease that indicated the major role of low-velocity trauma for upper and lower extremities in the rural part of population that mainly comprises farming population and involvement of trauma in day-to-day farm activities.<sup>[6]</sup> Similar results have been observed after the strict implementation of stay at home rules in Turkey to fight the rapid rise of COVID-19 cases during the month of April 2020. During this month, due to the strict implementation of lockdown – the traffic accidents, traffic accident-related injuries, and related fatalities decreased markedly. During April, traffic accidents reduced by approximately 60%, fatalities decreased by about 43%, and overall traffic related injuries fell down by 60%<sup>[7]</sup> when compared to the data of cases seen in April 2019. This has been estimated to avoid about 176,000 injuries, approximately 21,000 accidents and 200 deaths over a period of 1½ months in Turkey.<sup>[8]</sup>

## CONCLUSIONS

The current COVID-19 pandemic resulted in reduction of total number of admissions due to reduced number of patients visiting the hospitals due to fear of contracting COVID; changes in the hospital policies regarding the admissions of patients for non-emergency purposes. At the same time, the number of patients due to trauma reduced due to overall reduction in the number of RTAs and assaults. The change noted in this study can be used to frame policies regarding the allocation of both human and capital resources pertaining to health care to ensure minimum wastage and optimum availability of resources in times of crisis like these.

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### Ethical Approval

Provided in the letter addressed to the editor.

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