Section: Cardiovascular and Thoracic Surgery

Original Research Article

PROFILE OF CHEST TRAUMA DUE TO ROAD TRAFFIC ACCIDENTS IN THE POST-COVID PERIOD: A SINGLE CENTRE ANALYSIS

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Abstract

Background: Chest trauma accounts for nearly 30% of all trauma cases and contributes to 25-50% of trauma-related deaths. The COVID-19 pandemic, with its respiratory complications, was expected to worsen morbidity and mortality in patients with chest trauma. Additionally, lockdown measures significantly reduced vehicular movement, leading to a decline in road traffic accidents (RTAs). This study aimed to assess the prevalence of RTA-associated traumatic chest injuries in the post-lockdown period and the proportion of cases requiring cardiothoracic surgical intervention. **Materials and Methods:** This retrospective analytical study included 20 patients with chest trauma due to RTAs who required cardiothoracic surgical care at Rajiv Gandhi Government General Hospital, Chennai, following the relaxation of lockdown measures (from June 2021 onwards). Patient data were collected from the admission records and OT registers. The prevalence of chest trauma was analysed, and the need for surgical intervention versus conservative management was assessed. **Result:** Males accounted for 90% of the cases, with a mean age of 44.5 years. In the initial months post-lockdown, the number of patients requiring ICU admission for chest trauma remained low. Among all cases, six patients (30%) required surgical intervention, with four undergoing emergency procedures and two requiring delayed decortication for the haemothorax. Most cases (70%) were managed conservatively with ICD insertion, chest physiotherapy, and careful observation. **Conclusion:** This study found no significant change in the severity of RTA-associated chest injuries requiring cardiothoracic surgical intervention in the post-lockdown period. Although the overall incidence of RTAs fluctuated, the need for cardiothoracic surgical management remained constant.

INTRODUCTION

Chest trauma, a significant source of mortality and morbidity, constitutes nearly 30% of all cases of trauma and contributes to nearly 25-50% of all trauma-related deaths.[1] Early identification, urgent first-aid, emergency intervention, and specialist treatment can drastically improve the outcome of such cases and significantly decrease the morbidity and mortality associated with chest trauma. The COVID-19 pandemic, a primarily respiratory pathology, has been shown to worsen both morbidity and mortality in cases of chest trauma occurring concurrently.[2] The viral infection, causing invasion and colonisation of lung parenchyma leading to parenchymal injury, can manifest complications due to hypoxia-related myocyte injury, decreased immune response, myocardial damage, altered body homeostasis on a general level and dyselectrolytemia, lactic acidosis and cellular damage on a molecular level.[1,3]

From its onset in early 2020 until mid-2021, COVID-19 spread and infection presented in waves, as reported by cases and fatalities. To halt and contain this spread, the government, from time to time, enforced restrictions in the form of lockdowns at various points in time, the major impact being on the movement of vehicles – imposing graded to strict restrictions on vehicular movement.[4] This overall had, apart from the effect on curbing the spread of the COVID-19 virus, a few other positive effects like improved air quality, reduced noise, and water pollution, but most drastically noted – reduced traffic crashes and associated morbidity and fatalities.[5]

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There is documented research that there is a direct correlation between traffic volume and crash rates, and research has shown that stringent implementation of lockdown measures and high residential mobility considerably reduced crash fatality ratios (CFR).[5,6,7] Most cases of cardiothoracic injuries are time-sensitive, requiring immediate or urgent intervention of any form to prevent permanent morbidity or loss of life.

Aim

This study aimed to assess the prevalence of Road Traffic accidents (RTA) associated with traumatic chest injury in the post-lockdown relaxation period and the number of patients requiring surgical intervention.

MATERIALS AND METHODS

This retrospective analytical study included 20 patients admitted for cardiothoracic surgery to the Intensive Care Unit at Rajiv Gandhi Government General Hospital, Chennai, since June 2021. The Institutional Ethics Committee approved this study before its initiation.

Inclusion Criteria

Patients with chest trauma due to RTA after the lockdown were included.

Exclusion Criteria

Patients without chest trauma due to RTA after the lockdown were excluded.

Methods

Data of patients admitted for cardiothoracic surgery were collected from the admission records and OT registers and analysed in detail. An overall numerical presentation was made between all cardiothoracic specialities in patients who presented with trauma to the chest in the post-lockdown relaxation period. Data are presented as mean, frequency, and percentage.

RESULTS

Regarding sex, males were predominant 18(90%) compared to female patients 2(10%) [Figure 1].

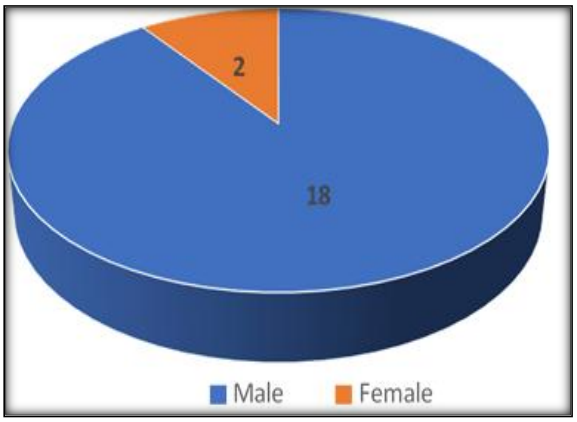

Figure 1: Gender distribution

The youngest patient was 16 years old, and the oldest was 68 years old, with an average age of 44.5 years [Figure 2].

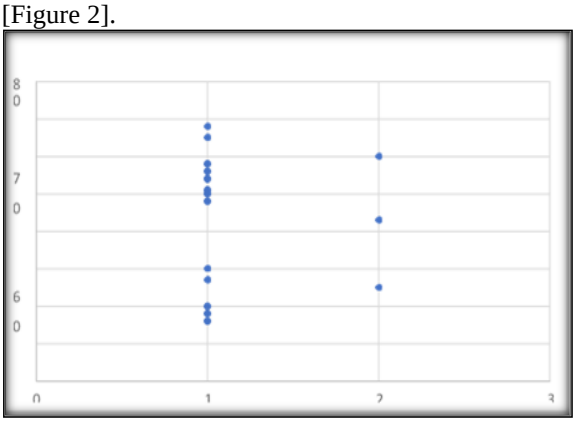

Figure 2: Age distribution

In the initial months of lifting the lockdown, few patients required specialist ICU admission [Figure 3].

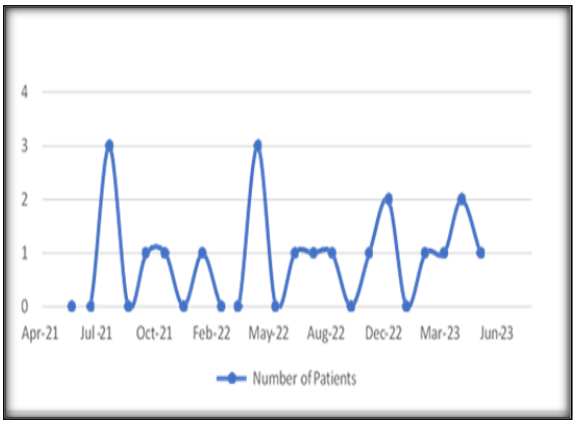

Figure 3: Distribution of CTS ICU admission

Only six of these patients underwent surgery, four of which were performed immediately post-admission on an emergency basis, and two underwent delayed surgery and decortication for non-expansion of the lung secondary to haemothorax causing respiratory compromise. However, all surgeries were performed during the same hospital admission period, and patients were not readmitted for surgical intervention [Figure 4].

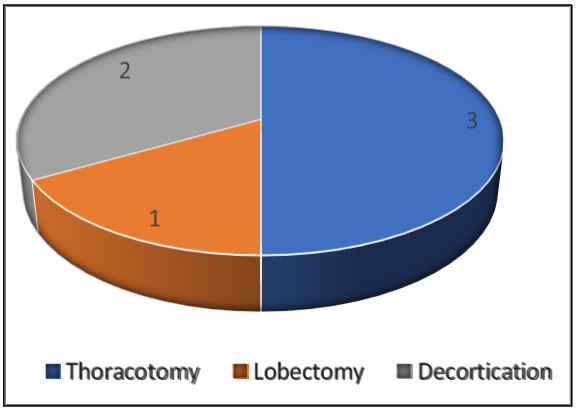

Figure 4: Distribution of surgeries done

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Most patients were managed conservatively with ICD insertion, chest physiotherapy, incentive spirometry, and observation [Figure 5].

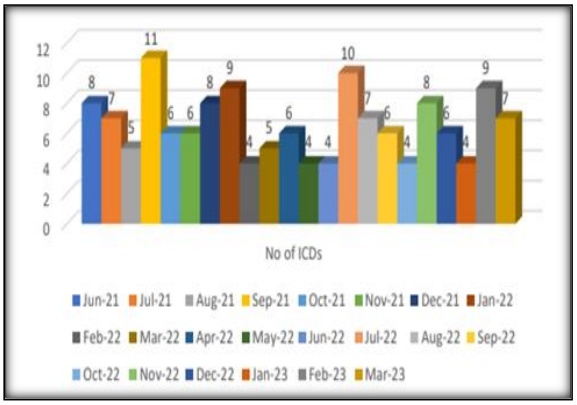

Figure 5: Distribution of ICD insertion for chest trauma

DISCUSSION

With the start of an uptrend in the number of diagnosed COVID-19 cases in the first wave toward the end of March 2020, approximately six weeks after many parts of Europe and the US, both the state and central governments implemented lockdown restrictions of varying durations, both partial and complete, in alternation, with minimal permission for traffic movements. Traffic flow witnessed substantial changes in terms of the type of vehicles and the timing of their movement during the phases of complete and partial lockdowns. The directly impacted mobility due to movement restrictions and the subsequent higher traffic flow post-lockdown relaxation has shown to be directly related to the fall and rise in the number of road traffic accidents.[4]

There were instances of anomalous behaviour of commuters, resulting in more road crashes in certain provinces of other countries during the restrictive phases of stay-at-home orders. However, other research findings in similar settings did not find any such increase, probably due to the absence of errant behaviour, which included overspeed driving, drunk driving, and not wearing seat belts in Tamil Nadu during the restrictive periods of the pandemic, due to more stringent enforcement of lockdown measures by the state police and stricter action against those who violated these orders.[4]

Limitations

The data for this study were obtained retrospectively from inpatient admissions and OT registers. Patients presenting with road traffic accident complaints to the OPD without admission were excluded. The data were drawn from a single centre, although patients from various places were referred there as one of the first respondent hospitals. The study did not include patients treated in other hospitals, making it difficult to extend this pattern as a reference for chest trauma prevalence due to road traffic accidents in the entire city during the period. Hence, bias was not eliminated.

This study did not compare the lockdown effects in Chennai's suburbs and outskirts. The study site was in the city centre, and patients from distant parts did not seek first-respondent treatment from the hospital in the study setting.

CONCLUSION

Our study has shown that although the pandemic caused fewer road traffic accidents serious enough to cause chest trauma, there has been a resurgence post-lifting of lockdown restrictions, following a fall in cases admitted for speciality management during the active COVID-19 phase. Reduced mobility decreases road traffic accidents. However, post-lockdown, with the surge in vehicular traffic, there has been a significant increase in accidents, causing both isolated chest trauma and chest trauma associated with other injuries in our country. This can be attributed to the increase in vehicular movement once lockdown restrictions were lifted, causing more people to move on the roads for work and recreation.

REFERENCES

1. Ekpe EE. Profile of Chest Injury in the Peri-COVID-19 Period: A Single Centre Series. Clin Surg 2022; 8:1–7. https://www.researchgate.net/profile/Eyo-Ekpe-2/publication/371830118_Profile_of_Chest_Injury_in_the_Peri-COVID-19_Period_A_Single_Centre_Series/links/6496eeb88de7ed28ba52529e/Profile-of-Chest-Injury-in-the-Peri-COVID-19-Period-A-Single-Centre-Series.pdf.
2. Wang Y, Zeng C, Dong L, Liu C, Cai Y, Zhang N, et al. Pulmonary contusion during the COVID-19 pandemic: challenges in diagnosis and treatment. Surg Today 2020; 50:1113–6. https://doi.org/10.1007/s00595-020-02081-9.
3. Sabetian G, Feiz F, Shakibafard A, Fard HA, Sefidbakht S, Jafari SH, et al. Challenges of diagnosis of COVID-19 in trauma patients: A case series. Trauma 2021; 23:218–29. https://doi.org/10.1177/1460408620950602.
4. Paramasivan K, Subburaj R, Sharma VM, Sudarsanam N. Relationship between mobility and road traffic injuries during COVID-19 pandemic role of attendant factors. PLoS One 2022;17: e0268190. https://doi.org/10.1371/journal.pone.0268190.
5. The unseen positive effects of lockdown due to the COVID-19 pandemic: Air pollution, sound pollution, water pollution, sanitation and hygiene, behavioural change, global warming, road traffic accidents. Indian J Forensic Med Toxicol 2021. https://doi.org/10.37506/ijfmt.v15i1.13437.
6. Høye AK, Hesjevoll IS. Traffic volume and crashes and how crash and road characteristics affect their relationship - A meta-analysis. Accid Anal Prev 2020; 145:105668. https://doi.org/10.1016/j.aap.2020.105668.
7. Gupta M, Pawar NM, Velaga NR. Impact of lockdown and change in mobility patterns on road fatalities during COVID-19 pandemic. Transp Lett 2021; 13:447–60. https://doi.org/10.1080/19427867.2021.1892937.

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