

Peer Review File

Article Information: <https://dx.doi.org/10.21037/jss-22-46>

Reviewer A

The work presented by the authors is interesting and brings knowledge to the field on the impact that the emergence of COVID-19 has had on the incidence of spinal cord injury. However, the manuscript needs to be revised before publication. A number of suggestions for the improvement of the study are presented below:

General recommendations:

Please try to rewrite the document in the impersonal form. Example: “Our institute is...” should be replaced by “The institution where the present study was carried out...”

*Reply: We have modified the text to impersonal forms,
Changes in the text: see abstract page 3 lines 71 and 83, introduction page 5 line 97,
discussion page 9 line 206, 246.*

Specific comments:

1.- Please move lines 70-72 to the methods section.

*Reply: Text modified to move this statement to the methods section
Changes in the text: methods line 133*

2.- The introduction section should be expanded. Talk about the consequences of COVID on people with spinal cord injury. It would be interesting if you could provide information on whether or not operating theatres were closed during the period when measures to contain COVID were in place, whether planned operations were postponed, etc. People with spinal cord injury are a vulnerable group, and prolonging some operations can have major changes on the quality of life of these people.

Reply: We acknowledge the impact delaying planned surgery would have on the SCI population, however we did not collect data on the elective procedures that were postponed, and so we are unable to add this information into our report.

Changes in the text: Introduction modified to expand on the impact of covid on the SCI population and to expand on COVID measures for elective and emergency procedures during Covid, see page 5-6 lines 109-115

3.- Please indicate which variables met the assumption of normality and which did not. Lines 102-104

*Reply: Methods edited to add clarity,
Changes in the text: see page 7 lines 152-158*

4.- Please check table 2. When all participants of each type of injury mechanism are

added together, they do not result in the specified total. Exemple PRE-COVID (218 TOTAL CASES / 304 TOTAL CASES). If you do not get the same number because there may be sub-classifications that are contributed separately such as “recreation” and “cycling”, please indicate this in some visual way.

Reply: several of the patients overlap in categories, for example a work-related MVA would go into both categories. Now that the data is aggregated and de-identified it would be difficult to separate this data, although we acknowledge that would have been useful to have separated in this instance

Changes in the text: Nil

5.- It might be interesting to add what the mechanisms of injury have been specifically in spinal cord injuries in Table 3.

Reply: this information was not collection in our initial analysis and while we acknowledge its utility, we are unable to provide it at this point

Changes in the text: Nil

6.- Please, indicate the limitations of the study in the discussion

Reply: A section describing the limitations has been added

Changes in the text: Discussion page 11 lines 264-267

Reviewer B

Abstract:

- The results in the abstract first state there were 7.3% fewer operations during COVID and then state there were 44% fewer operations for motor vehicle accidents. These numbers don't seem to align.
- *Reply: the 7.3% represents the total number of operations for all mechanisms of injury, whereas the motor vehicle accidents are considered as a sub group of the total, which as a group decreased by 44%.*
- *Changes in the text: Abstract results section has been edited to add clarity, page 3 lines 76-80*
- Authors also state: “the average number of spinal levels affected by injury decreased...” It might be important to reword this statement as it currently implies that COVID resulted in decreased spinal levels.
- *Reply: our findings were that during covid the number of levels affected in the spinal cord injuries decreased*
- *Changes in the text: Results section edited to add clarity, page 3 lines 76-80*
- The conclusion doesn't align with the results, which stated conclusion states a greater number of spinal cord injuries was noted.
- *Reply: thank you for bringing this to our attention*
- *Changes in the text: the conclusion has been edited for clarity, page 3 lines 82-86*

Introduction:

- More expansive background on the changes in health care system during the pandemic would be helpful to the reader, i.e. what services were shut down etc.
- *Reply: thank you for the suggestion, we have expanded this*

- *Changes in the text: introduction, page 5 lines 95-103*
- Background on when restrictions started and when they were lifted would be helpful to justify the time periods selected in the methods section.
- *Reply: We agree this is a useful addition*
- *Changes in the text: time period information has been added to introduction, page 5 line 97-101*
- Information on number of people currently living with SCI and the burden isn't as important as how many people were seen for spine related trauma previously.
- *Reply: thank you for the comments. We have expanded on this section to make it more relevant*
- *Changes in the text: Introduction, page 5 lines 110-115*

Methods:

- Justification of selected time periods would be beneficial.
- *Reply: Justification has been added to the methods and elaborated in the discussion*
- *Changes in the text: Methods page 6 lines 141-142, discussion page 11 lines 265-267*
- Along with injury characteristics, other information related to health systems would be helpful, i.e. wait time, LOS, etc
- *Reply: unfortunately this was not captured in our analysis initially and so we can not add this information at this stage*
- *Changes in the text: Nil*

Results:

- Information on referrals should also have been explored as that may impact those seen in trauma centres.
- *Reply: This may have been useful to know. Unfortunately while we had information on total referrals to the emergency department, we did not collect the number of referrals to the spinal surgery unit*
- *Changes in the text: nil*

Discussion:

- There are several discrepancies between what is reported in the results and what is discussed in the discussion.
- *Reply: Thank you for examining the results and identifying these issues*
- *Changes in the text: Several changes to results and discussion to remove discrepancies and add clarity for the reader, see below*
- The authors note: "Rates of ASIA B and ASIA D spinal cord injuries (indicating an incomplete spinal cord injury) increased between periods." However, in the results, it is noted that no changes to D was found.
- *Reply: While it was an absolute increase, the change was not significant*
- *Changes in the text: Removed: "ASIA D" from that statement in discussion, page 10 line 236*
- The authors also note: "An increased proportion of low energy mechanisms (such as fall from standing height) and fewer high energy road accidents may explain the differences in cord injury severity seen in our cohorts." The results indicate no difference.
- *Reply: the wording of this statement could be improved*
- *Changes in the text: Discussion page 10 line 238, edited to add clarity and remain*

consistent with our results

- Expansion on how the study's results have clinical implications would be helpful.
- *Reply: yes this is an important aspect of the study*
- *Changes in the text: discussion page 11 lines 250-255 edited for clarity on the main drivers of increased time in theatre. Discussion page 10 lines 232-240 edited for clarity on the cord injury severity and mechanism of injury found in our study*
- The current study has several limitations, thus identification of limitations to study is warranted.
- *Reply: Thank you for the suggestion*
- *Changes in the text: Discussion page 11 lines 264-267, limitations have been added*

Reviewer C

I believe this is a well-written article containing informative interesting issues related with the change in spinal trauma practice during the COVID pandemic. However, some points need to be pointed out for revision before acceptance.

Introduction

1. Row 61; decreased by 38 what? Percent?

Reply: Yes, percent, this was an accidental omission. Thank you for bringing to our attention.

Changes in the text: % sign added to text in introduction, line 106 page 5

2. In the introduction, more information on what novel information the authors are investigating and how their study contributes to the existing literature might be helpful. Although it is already including key information about what the authors are willing to invest, some more baseline information about why studying the change induced by COVID pandemic in this specific injury (SCI) is important should be stated. Currently it is hard to find a good explanation on why the authors started this investigation.

Reply: The main reason we performed it is there were limited studies on this topic in the literature at the time. Since commencing this study some overseas institutions have published some relevant papers. We felt it important to document the Australian experience in the pandemic time period in order to compare and contrast our experience and see if there were learning points we could take forward as we emerge from the pandemic

Changes in the text: Introduction page 5 lines 109-116, expansion of the impact of the pandemic on SCI patients. Introduction page 6 lines 120-127, expansion of the aims of the study

Discussion

1. I feel that the discussion is relatively very well written.

2. However, jumping to a conclusion that the decreased injury severity or volume is a consequence following limited social interactions or movement – without providing a relevant reference data is not good. This might still be a speculation made by the authors, therefore, rather than concluding so, it would be better to present this as a possible reason.

Reply: Thank you for the comments

Changes in the text: Discussion page 10 line 220 - wording changed to be more speculative, discussion page 10 lines 232-240 - wording changed to add clarity

Conclusion

1. Can you really reach to a conclusion that there was an overall reduction in the volume of emergency operations during COVID pandemic; simply because there were 202 vs 218 cases? I can't see statistical analysis comparing these numbers.

Reply: This is an absolute reduction but you are correct there is no analysis of this figure

Changes in the text: Discussion page 9, line 213

I do not find any critical weak points in this article. Although there are some limitations, I believe it is a valuable effort to find differences in our practice during social issues. I believe it will be a good additive knowledge to spinal specialists after proper amendment.

Reviewer D

This is a nice description of the spinal cord injury trauma requiring surgical intervention during the pandemic compared to the pre-pandemic stats. Of interest if the increase in operative time which is postulated as caused by additional testing time, do the authors have a definite correlation? In a similar review Giorgi et al. have reported a decreased time from admission to surgery which they attributed to a newly implemented organizational protocol [Giorgi PD, Villa F, Gallazzi E, Debernardi A, Schirò GR, Crisà FM, Talamonti G, D'Aliberti G. The management of emergency spinal surgery during the COVID-19 pandemic in Italy. Bone Joint J. 2020 Jun;102-B(6):671-676. doi: 10.1302/0301-620X.102B6.BJJ-2020-0537. Epub 2020 Apr 23. PMID: 32323563; PMCID: PMC7241059]. It seems that the infection triage protocols would occur prior to the surgical procedure and not accounted as part of the operating time. Is that not the case?

Reply: Yes the pre operative testing time is not part of the operative time. Our study actually showed the operating time to be the same, but the time inside the operating theatre to increase, which is therefore most likely to be because of the additional protocols immediately pre and post surgery

Changes in the text: Discussion page 10-11 lines 242-255 edited to add clarity on this issue

Like many manuscripts which analyze the impact of COVID on the provision of healthcare services, the authors hypothesize differences in presentation and outcomes to inform stakeholders and optimize infection triage protocols. If that is the case, a more robust attempt at identifying the cause of extended surgical time is needed.

The conclusion that "further investigation of social drivers may generate new public health strategy for spinal injury prevention" is appreciated although not particularly original.

Reply: The surgical time was not significantly increased, however the time inside the theatre was - this is most likely due to the additional pre and post operative protocols

Changes in the text: Discussion page 10-11 lines 242-255 edited to clarify the surgical time increase. Conclusion expanded to reflect this aspect of the study, page 11-12 lines 269-274