

## COMPARISON OF NEW INJURY SEVERITY SCORE AND INJURY SEVERITY SCORE IN PATIENTS WITH MULTIPLE TRAUMA AT A TERTIARY CARE HOSPITAL

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### Abstract

**Background:** One of the main global causes of mortality and morbidity is trauma. According to the WHO, an accident is a sudden, externally-caused incident that causes physical or mental harm and is independent of human volition. **Aim:** This study aimed to compare new injury severity scores and injury severity scores in patients with multiple trauma at a tertiary care hospital in Tirunelveli. **Materials and Methods:** This research was a longitudinal observational study conducted in the Emergency ward at Tirunelveli Medical College and Hospital between October 2018 to September 2020. The sample population included 100 patients reporting multiple trauma. Investigations such as X-rays, USG, and CT scans were advised per each patient's requirement. **Result:** Most patients were male, and the injury was mostly seen in the 21-30 age group, while in the 60 years and beyond age group, the frequency of trauma was the least. The main cause of emergencies in most cases was road traffic accidents. The most frequently injured organ was external, followed by the extremity. The majority of them were blunt trauma. Patients with head and blunt injuries in the abdomen had a longer stay in the hospital. The new injury severity score identifies critical and severely injured patients early compared with the injury severity score. **Conclusion:** The findings of this study suggest that ISS and NISS scores can better help the Emergency Team predict the prognosis. However, NISS has maximum prediction in outcome when compared with the other scores.

## INTRODUCTION

One of the main global causes of mortality and morbidity is trauma.<sup>[1]</sup> According to the WHO, an accident is a sudden, externally-caused incident that causes physical or mental harm and is independent of human volition. Today's violence and technological advancements worldwide are a factor in the rising incidence of trauma-related fatalities and impairments. The countries with fatal road accidents are India and the United States. Since the dawn, humanity has struggled to treat trauma victims everywhere properly. Different trauma severity indices have been developed to help deliver effective and optimal outpatient or patient care to these patients. Through consistent terminology, these indices evaluate anatomic damage's severity and the likelihood that such patients would survive.

Planning emergency care, determining the need for hospitalisation, maximising hospital resources, and identifying epidemiological factors are all made possible by these scoring systems. The outcomes of trauma studies have utilised several severity indexes. The grounds for these scales can be physiological, anatomical, or a combination.<sup>[2]</sup> A frequent technique used in clinical trauma investigations is the trauma score system. It can make it easier to compare the effectiveness of various treatments and gauge the seriousness of an injury.<sup>[3]</sup> ISS is the most widely used trauma scoring system based on the anatomy parameters and provides an overall evaluation for patients with multiple injuries. ISS was introduced in 1974.<sup>[4]</sup> It has been one of the most widely used trauma scores. Osler et al. suggested NISS as an improvement to ISS in 1997.<sup>[5]</sup> This research aimed to compare new

injury severity scores and injury severity scores in patients with multiple trauma at a tertiary care hospital in Tirunelveli.

## MATERIALS AND METHODS

This research was a longitudinal observational study conducted in the Emergency ward at Tirunelveli Medical College and Hospital between October 2018 to September 2020. The sample population included 100 patients reporting multiple trauma. Investigations such as X-rays, USG, and CT scans were advised per each patient's requirement.

### Inclusion Criteria

History of Trauma and Age > 12 years.

### Exclusion Criteria

The patient was discharged against medical advice and unwilling to receive treatment.

Details regarding the history and examination findings related to the trauma were recorded using a semi-structured questionnaire. ISS and NISS scoring was calculated for each patient. All data were collected and analysed.

## RESULTS

As seen in [Figure 1], the majority of patients were male.

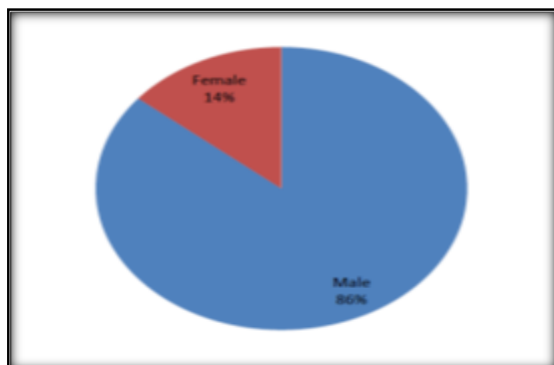


Figure 1: Gender distribution

[Figure 2] shows that injury was mostly seen in the 21-30 age group, while in the 60 years and beyond age group, the frequency of trauma was the least.

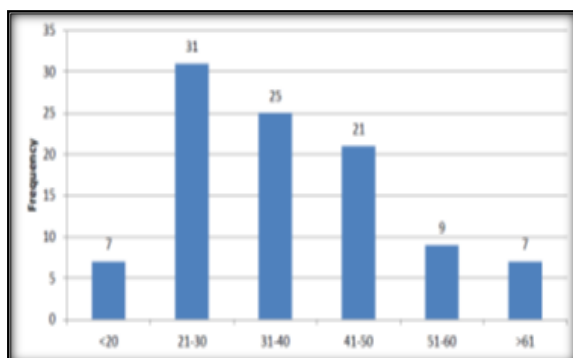


Figure 2: Age of distribution

[Figure 3] shows that the main cause of emergencies in most cases was road traffic accidents

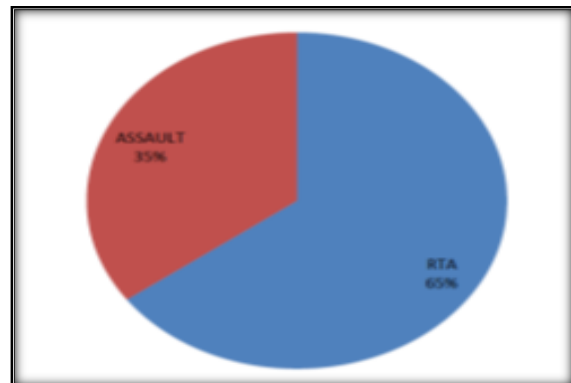


Figure 3: Nature of emergencies

[Figure 4] shows that external injuries had the maximum frequency

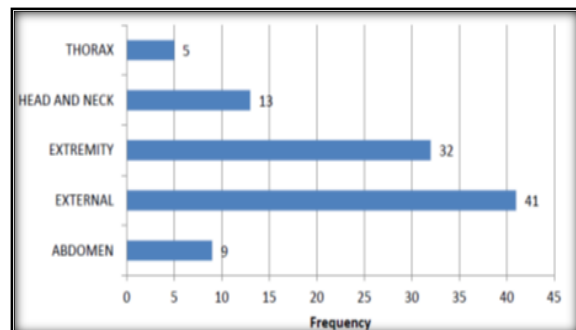


Figure 4: Region of Injury

In Figures 5a & 5b, scoring was done based on injury severity

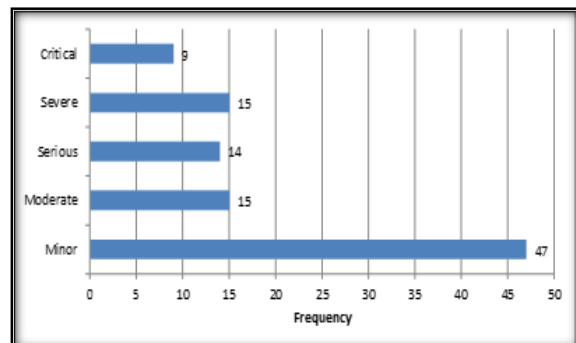


Figure 5a: NISS score

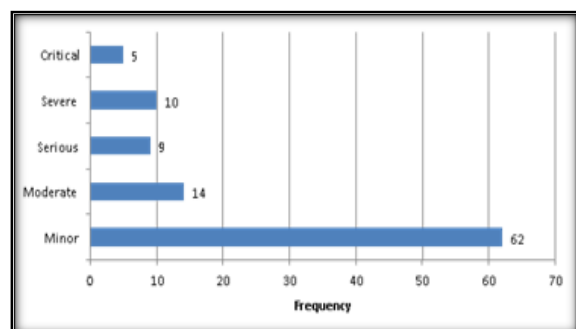


Figure 5b: ISS score

## DISCUSSION

Numerous grading methods have been applied to trauma. Injury Severity Score (ISS) has been regarded as the "ideal standard" for categorising trauma sufferers, including those who have suffered blunt and penetrating trauma. The Abbreviated Injury Scale (AIS) is the basis for ISS, and scores can range from 1 (minimum severity) to 6. (Maximum severity). However, ISS only considers the most severe lesion in individuals with numerous lesions in the same body location, ignoring the second-most severe lesion. The New Injury Severity Score (NISS), which takes the three worst lesions into account regardless of the body area, was developed to get around these constraints. This study's primary goal is to determine whether switching from ISS to NISS will increase predictive value and streamline scoring. Computing ISS & NISS in order to compute ISS, the body is divided into six regions: head and neck, face, thorax, abdomen, extremities (including pelvis), and external. Each injury on the body is assigned an abbreviated injury scale (AIS) score, and only the highest score in each region is used. ISS is calculated as the sum of the squares of the highest three AIS scores. The maximum score of ISS is 75. If a patient with AIS 6 in one body region, by convention, he is given an ISS of 75. However, ISS has limitations because multiple injuries within the same body region are only assigned a single score, which may underestimate the trauma patients' severity.<sup>[6-7]</sup> Regardless of the body location affected, NISS was defined as the sum of the squares of the three worst injuries. When the most serious injuries are spread among various ISS regions, NISS is at least as effective as ISS. Most of the time, the results may significantly outperform ISS when NISS is utilised to evaluate patients who have sustained repeated traumas.<sup>[8]</sup> Sharma et al. study has favoured NISS as a better predictor of morbidity than ISS. It was seen that the higher the injury severity, the more it becomes a better predictor of morbidity.<sup>[9]</sup> Similar findings were observed in our study, according to which the NISS score showed higher sensitivity towards severe trauma cases than the ISS score. Contradictory to this, according to Brown et al., the ISS score is a more appropriate definition for severe injury.<sup>[10]</sup>

## CONCLUSION

The findings of this study suggest that ISS and NISS scores can better help the Emergency Team predict

the prognosis. However, NISS has maximum prediction in outcome when compared with the other scores. More and more Road traffic accidents occur daily due to the increased Population using two-wheelers and four-wheelers. In this prospective observational study of 100 patients admitted with trauma following Road traffic accidents and Assaults, only 7 are above and below the age group of 60 and 20. Most of the patients affected are Male, and most are in the age group of 21-30 years. The present study indicated that road traffic accidents were the most common mechanism leading to trauma. The most frequently injured organ was external, followed by the extremity. The majority of them were blunt trauma. Patients with head and blunt injuries in the abdomen had a longer stay in the hospital. The new injury severity score identifies critical and severely injured patients early compared with the injury severity score. The new injury severity score assesses the nature, mode, and severity of injury early on compared with the injury severity score.

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