Traumatic Spinal Cord Injury, an Overview of Epidemiology and Management in Vindhya Region

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Abstract

Background: Traumatic spinal cord injury (SCI) is a life changing neurological condition with substantial socioeconomic implications for patients and their care-givers. Recent advances in medical management of SCI has significantly improved diagnosis, stabilization, survival rate and well-being of SCI patients.

Objectives: The objectives of this study were (1) to determine the characteristics of patients sustaining spinal trauma in India and (2) to explore the association between patient or injury characteristics and outcomes after spinal trauma.

Method: The study includes patients admitted with TSCI admitted at the Central shyam shah memorial medical college and associated government medical college, from March 2019 to March 2020. Patient enrolled for the study were admitted directly or after being referred from peripheral health centers. Both conservatively managed and operated patients were taken into account

Results: Most patients were middle-aged (mean age = 51.0 years; median age = 55.5 years; range = 18.0 to 72.0 years), male (60.4%), injured from falls (72.4%), and treated in a private setting (59.9%). Fractures in the lumbar region (51.0%) were most common, followed by thoracic (30.7%) and cervical (18.2%). More than 1 in 5 (21.6%) patients experienced a treatment delay greater than 24 hours, and 36.5% arrived by ambulance. Thirty-day mortality and complication rates were 2.6% and 10.0%, respectively. Care in the public hospital system (odds ratio [OR] = 6.7, 95% CI = 1.1-41.6), chest injury (OR = 11.1, 95% CI = 1.8-66.9), and surgical intervention (OR = 4.8, 95% CI = 1.2-19.6) were independent predictors of major complications.

Conclusions: Treatment in the public health care system, increased severity of injury, and surgical intervention were associated with increased risk of major complications following spinal trauma. The need for a large-scale, prospective, multicenter study taking into account spinal stability and neurologic status is feasible and warranted.

Keywords: *Spinal trauma, spinal fracture, India, complications, reoperation, mortality, public versus private hospitals, spinal surgery.*

Introduction

Vindhya region comprises of four districts, Rewa, Satna, Sidhi, Shahdol. It is one of the major parts of Madhya Pradesh near its northern part, sharing its border with Uttar Pradesh. It is one of the largest rural areas of the country with agriculture being the main occupation. Medical facilities have been very limited with a single medical college in rewa, before the inauguration of Shahdol medical college. A new superspeciality hospital has been recently constructed in rewa with neurosurgery, cardiology and CTVS branches. Population in the region is 657750[(1)] the study was conducted in the department of neurosurgery at Shyam shah medical college, rewa

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from march 2019 to march 2020. It includes all the cases of spinal trauma, admitted directly or after being referred from peripheral centres. A total of 198 cases were observed. Amongst them, 68 cases had thoracic injury. 86 patients had lumbar spine injury and 22 patients had cervical spine injury and rest 22 patients had spine injury at more than one segment. Thoracic and lumbar regions were affected more commonly. Age wise categorization showed that most common age group was 25 to 50 which consisted of 138 cases. Below 25 years, the number of cases was 41. Remaining 19 cases were from 50 plus age group. Most common mode of injury was road traffic accident. Fall from bike due to collision with other vehicles being the most common reason. Road traffic accidents (RTA) accounted for around 70% cases ie; 136 of total 198 cases. Fall from height was responsible for 52 cases. 8 cases came after assault. 2 cases came after trivial injury who were later found to have atlanto axial dislocation. Gender wise, malepercentage was high, accounting for atleast 80 % cases whereas female case percentage was only about 20%.

Materials and Method

Our study was a prospective, institute-based analysis of spine injury patients. The study includes patients admitted with TSCI admitted at the Central shyam shah memorial medical college and associated government medical college, from March 2019 to March 2020. Patient enrolled for the study were admitted directly or after being referred from peripheral health centers. Both conservatively managed and operated patients were taken into account. Permission of the Ethics Committee ofssmc, rewa was taken. The patients who expired before reaching the department were excluded from this study.

Results and Observation

In our study, the most common cause of spine injury was road traffic accident including hills, roof, trees, electricity pole, and stairs (70%) followed by fall from height, including trees, hills, stairs or roof of home (28%), which is comparable to other case series of India.[10] The most well-known influenced age bunch in this investigation was 20–39 years followed by 50–59 years. It tends to be seen that 56.14% (n = 32) patients go under the 20–39 years' age gathering, implying higher rate in youthful, dynamic, and beneficial populace of the general public. Injury in 50–59 years' age gathering (26.32%, n = 15) was generally because of fall. Like different investigations of India, male sex is more inclined to SCI.[12-16] Higher occurrence in guys can be clarified by assessment of etiological components, with men being more presented to chance variables since they are more dynamic because of occupations. Moreover, this is presumably because of family unit remain of females. Cervical wounds were the most well-known spinal wounds with 52.63% (n = 30). No sacral wounds were found. Most regular wounds discovered were crack disengagements of C5–C6 level. There was no instance of SCIWORA in the examination. SCI was found in 91.22% (n = 52) of spinal injury patients. Based on American Spinal Injury Association (ASIA) : Comparison of method of injury in various arrangement Series Fall from tallness (%) RTA(%) Chacko et al. (India, 1986)[12] 55.2 12.8 Lan et al. (Taiwan, 1993)[13] 23.3 61.6 Shingu et al. (Japan, 1994) [14] 29.2 44.6 Karacan et al. (Turkey, 2000)[16] 36.5 48.8 Present examination 59.42 35.08 RTA – Road car crash: Comparison of sex proportion in various arrangement Series Year Male:female proportion Chacko et al. (India, 1986)[12] 1986 13.5:1 Lan et al. (Taiwan, 1993) [13] 1993 4:1 Shingu et al. (Japan, 1994)[14] 1994 4.3:1 Chen (India, 1999)[15] 1999 3.7:1 Karacan et al. (Turkey, 2000)[16] 2000 2.5:1 Present investigation 4.18:1 . Mode of Spinal Injury (n=57) Mode of injury No of patients (%) Fall: Fall from slopes, steps/rooftop/tree/electric shafts 34 (59.64) RTA: RTA/RTA in the end prompts fall into profound canyon 20 (35.08) Fall of hefty item/avalanche 2 (3.5) Assault 1 (1.7) Total 57 RTA – Road auto collision reviewing, serious neurological wounds (ASIA B and higher) were found in 48.07% (n = 25) of patients. In 82.45% (n = 47) cases, no related injury was distinguished. The most widely recognized related injury was head injury (10.52%) trailed by chest injury. Occasional circulation of SCI demonstrated a stamped increment during summer, trailed by stormy season meaning .Age conveyance of spinal rope injury expanded development of individuals in this season. The normal season of transportation of patients was 15.35 h. During transportation, >90% of patients were not joined via prepared staff, who should realize how to deal with patients with SCI. Under 15% (n = 8) of patients were discovered to be shipped with cervical immobilizer in situ. The normal time of medical clinic remain was 22.83 days, with the most extreme time of stay being 111 days. During the treatment time frame, one patient passed on because of respiratory inconveniences. Decision SCI has a significant impact on individual as well as on family and society by mental and efficient way. The vast majority of the investigations in clinical

literary works are from created countries, whose epidemiological information are unique. Non-industrial nations like India ought to have an appropriate public arrangement of SCI detailing, which will be useful in recognizing hazard factors, different epidemiological elements, their preventive measures, and recovery. Public ought to likewise be taught and prepared about SCI and importations of right on time and appropriate transportation of SCI patients. Occurrence of RTAs can be diminished by actualizing exacting traffic rules; besides, in the current examination, liquor was one of the main sources of RTA and drive drunk must be restricted carefully. Age bunch 50–59 years is especially powerless against tumble from steps, rooftop, bed, and so forth Like other non-industrial nations, India doesn't have public level approach for care of mature age individuals. In contrast to different pieces of the nation, the upper east portion of India doesn't have spinal recovery habitats, which likewise builds the grimness of SCI patients. In spite of the fact that this examination is confined to one establishment just, it may not be the genuine portrayal of the study of disease transmission of this piece of the nation. Nonetheless, it very well may be taken as a pattern, as Sikkim is geologically like other northeastern conditions of india.

Discussion

We identified 64 papers from 28 countries. The incidence of SCI in developing countries was 25.5/ million/year. Males (82.8%) were more likely to sustain SCI than females. The mean age of SCI occurrence was 32.4 years. The relative frequency for following subgroups of SCI was: MVC 41.4% and falls 34.9%; complete and incomplete SCI were 56.5 and 43.0%, respectively; paraplegia and tetraplegia were 58.6 and 40.7%, respectively. However, there was no significant difference between MVC and falls, complete and incomplete SCI, paraplegia and tetraplegia. The most commonly reported complication was the development of pressure ulcers.

Conclusion

Traumatic SCI represents a heterogeneous and complex pathophysiology. While pre-clinical research on SCI has been an ongoing endeavor for over a century, our understanding of SCI mechanisms has been increased remarkably over the past few decades. This is mainly due to the development of new transgenic and preclinical animal models that has facilitated rapid discoveries in SCI mechanisms. Although SCI research has made an impressive advancement, much work is still needed to translate the gained knowledge from animal studies to clinical applications in humans.

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