A Prospective Study on the Demographic status of Thoracolumbar Fractures

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Abstract

Background: There is no doubt that health care providers face a great deal of challenge in the management of spine fractures which tend to occur at mechanical transition zones. Of all the spinal fractures, around (40-60)% occur at thoracolumbar junction region (T11-L2). The present study has been conducted with an aim to comprehensively study the demographic status of such patients and to assess the contributing factors that influence the spinal fractures.

Methods: This prospective study was carried out in GMC Jammu from October 2017 to December 2018. A total 20 patients with acute traumatic unstable burst fractures at thoracolumbar junctions were included in this prospective study who qualified the defined inclusion criteria. A detailed multidimensional history of patients on health, socio-economic aspects and information of the current injury, prior treatment for the injury before hospitalization was obtained. All epidemiological and technical data were analyzed and presented.

Results: The present study revealed that young male population are plausibly at higher risk of spine fractures than females and that L1 and L2 are the commonest sites for majority of spine fractures.

Conclusion: The study suggestive that the demographics of spinal injury in India diverges drastically from developed countries because the present study revealed lower mean age, larger proportion of males, injuries due to accidents or falls, paraplegics and complete injuries. We recommend large sample comprehensive studies that can precisely confirm these findings.

Keywords: Burst fracture, thoracic vertebrae injuries; demography; trauma

DOI Number: 10.14704/nq.2022.20.13.NQ88082 **Neuro Quantology 2022; 20(13):615-618**

Introduction

There is no doubt that health care providers face a great deal of challenge in the management of spine fractures which tend to occur at mechanical transition zones. Of all the spinal fractures, around (40-60)% occur at thoracolumbar junction region (T11-L2).[1]The structure of spine consists of three columns which carries an utmost importance in assessing the stability of fracture. The precise treatment management is largely determined by multiple factors like; fracture morphology, surgical expertise, accessible infrastructure and more importantly patient profile.[1-4] Regardless of the significant development in the management of spinal injuries, the prognosis remains poor with neurologically impaired status in a significant proportion of patients.[5] It has been documented that spinal instability are oftenly a result of high impact energy injuries but bone insufficiencies secondary to osteoporosis and compromised bone mineral densities among aging population cannot be excluded.[6] There are multiple studies that have studied the epidemiology and pattern of such travesties. Albeit, the description of extensive demographic profile and fracture distribution is uncommon in Indian population. The present study has been conducted with an aim to comprehensively study the demographic

status of such patients and to assess the contributing factors that influence the spinal fractures.

Material and methods

This Study was carried out in GMC Jammu from October 2017 to December 2018. A total 20 patients with acute traumatic unstable burst fractures at thoracolumbar junctions were included in this prospective study who qualified the defined inclusion criteria. This study was conducted with the approval from the ethics committee of our hospital. Patients with both Sexes aging 18-65 years, having traumatic burst fracture of thoraco lumbar junction with TLICS severity score ≥ 5 and presence of neurological deficit. However, patients having extremes of age, associated with cervical spine injury, spine deformity or previous fracture or spine surgery, multilevel fracture, compression fracture with intact neurological function and pathological fracture were excluded from the study. A detailed multidimensional history of patients on health, socio-economic aspects and information of the current injury, prior treatment for the injury before hospitalization was obtained. All epidemiological and technical data were analysed and presented.

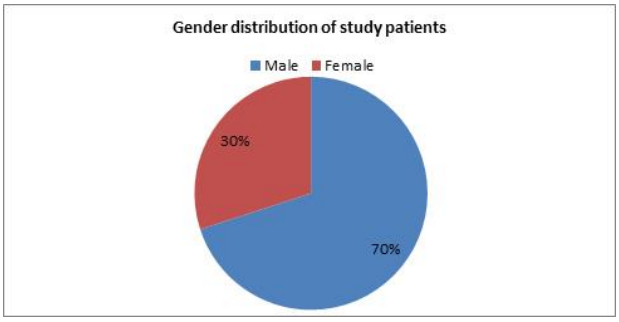
Results

In this section, the results of the study will be described in tabular and graphical form:

Table 1: Showing age distribution among studied patients

Age Interval (Years)	Frequency	Percentage (%)
20-25	4	20
25-30	6	30
30-35	5	25
35-40	4	20
>40	1	5
Total	**20**	**100**

Out of 20 patients, majority of the patients were in the age group 25-30 years (30%) and 30-35 years (25%). Youngest patient was of 23 years old while as oldest patient was of 65 years. Mean age was 31.9 years.

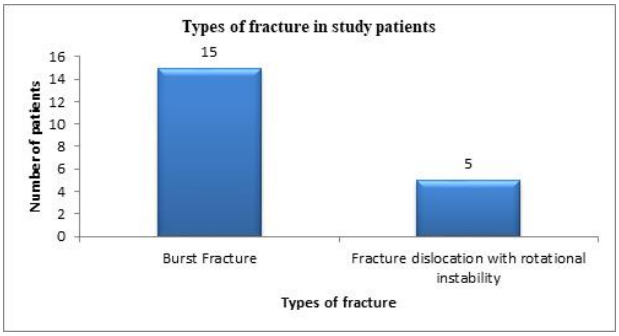


Majority of the patients, were male (70 %) while 30% patients were female thus placing the male to female ratio as 2.33:1

Table 2: Mode of Trauma

MODE	NUMBER	PERCENTAGE (%)
Fall from height	12	60
Road traffic Accident	07	35
Fall of weight on back	01	5

Traumatic thoracolumbar fractures in the present study were caused mainly by two modes; one being fall from height (60%) and second being road traffic accident (35%).

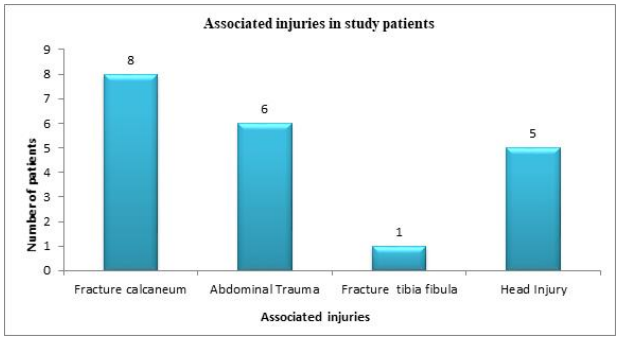


In our study, most of the fractures were burst type accounting for (75%).

Table 3: Vertebral Level of Injury

VERTEBRATE	NUMBER	PERCENTAGE (%)
D11	02	10
D12	03	15
L1	08	40
L2	04	20
L3	2	10
L4	1	5

Sixty percent (60%) of the patients sustained injuries at L1 and L2 vertebral level. Majority of spine fracture (40%) occured at L1 vertebral level followed frequency by L2 vertebral level (20%).



Out of 25 patients, 8 patients had fracture calcaneum which was managed conservatively, 6 patients had blunt trauma abdomen for which no active surgical intervention was required and was managed conservatively and 1 patient had fracture both bones left leg which was managed by CRIF with interlocking intramedullary nailing 2 weeks after fixation of spine fracture.

Discussion

In the present study we observed the age group involved in our study ranged from 20-65 years with a mean age of 31.9 years who are most productive member of our society which is slightly less than compared to other related studies. For instance, the average age of such patients has been respectively reported as 26.5 years, 65 years, 54.81 years, 34.85 years and 40.35 years by Ayerberk G et al, Suzuki T et al, Jo et al, Pham MH et al and Sasani et al.[7-11]In the present study, we observed that 70% patients were male and 30% were females, thus placing the male to female ratio as 2.33:1 which is comparable with the study due to Suzuki et al who reported male to female ratio of likewise patients as 2.5:1, but relatively larger than 1.28:1 and 0.75:1 as reported by Jo et al, Pham MH et al and Sasani et al.[8-11] The present study revealed that traumatic thoracolumbar fractures were mainly caused by two modes; one being fall from height (60%) and second being road traffic accident (35%). However, Pham et al and Sasani, et al reported road traffic accident as the commonest cause of the injury.[10,11]This very finding implies the importance for creating awareness programs, especially among the younger male population to ensure appropriate protective measures and prevent such possible travesties. We assessed the exact location of injuries and found that (60%) of the patients sustained injuries at L1 and L2 vertebral level. Majority of spine fracture (40%) occurred at L1 vertebral level followed frequency by L2 vertebral level (20%) in our study. This is in agreement with other related studies, where thoracolumbar junction is the commonest site for injury. Authors like Ayerberk G et al, Suzuki T et al, Jo et al, Pham et al and Sasani et al also reported that L1 followed by L2 as the commonest sites of spinal injuries.[7-11] We found that out of 25 patients, 8 patients had fracture calcaneum which was managed conservatively, 6 patients had blunt trauma abdomen for which no active surgical intervention was required and was managed conservatively and 1 patient had fracture both bones left leg which was managed by CRIF with interlocking intramedullary nailing 2 weeks after fixation of spine fracture. Some studies indicated that pelvic fractures and lower limb injuries are the commonest associated injuries in such travesties.[2-4, 12] We evaluated the neurological status of patients preoperatively and found that 8(40%) patients had complete injury (grade A), 7(35%) patients had grade B, 5(25%) patients had grade C, and 0 (0%) patients had grade D neurological status while 0 (0%) patients had no neurological impairment. The present study included only those patients who required surgical intervention for spine stabilization for; hence it is obvious that the incidence of neurological impairment was high. Injuries with plausibly higher risk of neurological deficit include, burst fractures (75%) fracture-dislocation (25%). In a similar kind of study by Gertzbein reported that 19% of the thoraco-lumbar fracture patients suffer from a complete grade A neurological deficit.[13,14] Similarly, Chung and Khurjekar et al. reported that 22.7% and 19.5% patients with neurological deficit respectively had a complete impairment (ASIA grade A) which is consistent with the results of our study.[15,16] The present study was conducted in Postgraduate Department of Orthopaedics, Government Medical College and Hospital, Jammu which happens to be the main central hospital and easily accessible for majority of population. Therefore, the associated demographic factors of thraco-lumbar fractures may be treated to represent general trends in the population.

Conclusion

The present study revealed that young male population are plausibly at higher risk of spine fractures than females and that L1 and L2 are the commonest sites for majority of spine fractures. Moreover, the free fall followed by road traffic accidents are the commonest causes of such adversity. Majority of such patients had complete grade A neurological deficit. The study suggests that the demographics of spinal injury in India differs drastically from that in the developed countries since there was a lower mean age, much larger number of males, married individuals, injuries due to accidents or falls, paraplegics and complete injuries. We recommend large sample comprehensive studies that can precisely confirm these findings.

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