A Study on Pattern of Spine Trauma in Patients Presented to Khyber Teaching Hospital, Peshawar

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ABSTRACT

Objective: This study was conducted to assess the pattern of spine trauma in patients presenting to Khyber teaching hospital in terms of level of injury, etiology, fracture type, and neurologic deficit.

Methods: This cross sectional study was performed at orthopedic surgery unit, Khyber teaching hospital, Peshawar. Patients presenting with spinal; cord injuries were included. Etiology, level of injury, types of fracture and neurologic deficit was recorded and assessed. Chi square test was performed for the assessment of association.

Results: The mean age of the patients was 33.28±9.63 years. There were 88 (69.3%) males and 39 (30.7%) females. Fall from height (50.4%) was the most prevalent etiology followed by RTA (30.7%). Thoracolumbar spine injury (49.6%) was the most prevalent level of spinal injury followed by cervical spine injury (29.9%). Majority patients had type A fracture 43.3%), type B (37%) was second leading fracture. Neurologic deficit was seen in 54.3% patients.

Conclusion: Fall from height is the most cause of spinal traumas in our country and road traffic accidents are the second leading cause. Thoracolumbar spine injury was the major presentation of the spinal injury location and type A was the most common type of fracture. Majority of the patients had neurologic deficit.

Keywords: Spinal cord injury, Neurology, Etiology.

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INTRODUCTION

Spinal column fractures signify a small quantity of all fractures from traumatic injury with an occurrence up to 23 %[1,2]. An injury to neurological structure frequently leads in partial or complete paralysis, disruption of spinal column can potentially cause instability, discomfort, and impaired function. Although, their influence on the health care setup and individual is considerable because of their potential for life long impairment, the related health care concerns, and expenses[3]. Complex decision-making is required due to the possibility of lifelong brain tissue injury and the presence of several traumatic injuries, including potentially fatal abdominal and thoracic injuries[4].

According to reports, nearly 30% of polytrauma individuals in the industrial nations had spinal injuries[5]. Road traffic accidents and falls from heights are the two major causes of spinal injuries, with traffic accidents being more common[6]. Injury to the thoracolumbar spine was more frequently than trauma to the cervical spine. The preponderance of patients who have suffered from spinal damages are polytrauma sufferers, and the probability of spinal traumas is narrowly associated with the severity of the first trauma[7].

The assessment of spinal injuries utilizing sophisticated imaging has become standard practice at major trauma centers even though spinal trauma is a frequent indication for diagnostic imaging[8]. The best way to understand spine injuries is to consider of the spine as comprising five separate anatomical zones, each with its own individual anatomy and patterns of injury. The cervicothoracic, low cervical,

thoracic, thoracolumbar, and low lumbar segments of the spine constitute these regions, with the low cervical and thoracolumbar parts of the spine[9].

The significance of initial stabilization in keeping with the ATLS protocol in these settings cannot be overstated. Despite initial patient stabilization, the presence of mechanical or neurological instability determines the choice of corrective surgery[10].

The implications of spinal injury may last around patient's entire life. Every component of life is impacted by it. Spinal cord damage can significantly change a patient's and their family's life. This study is initiated to record the spinal injuries pattern in terms of etiology, fracture types and level of spinal cord injury in our local health setup.

MATERIAL AND METHODS

This cross sectional study was undertaken at the department of Orthopedic Khyber Teaching Hospital from 1 July 2022 to 31 March 2023. After taking ethical approval from the hospital ethical board the study was conducted on 127 patients presenting to the emergency orthopedic unit for spinal cord injuries. All the enrolled patients were subjected for clinical evaluation and radiographic evaluation for spinal cord injuries. Data was gathered from all the patients for etiology of the injury (RTA, Fall, Firearm and Sports injury), level of injury (cervical spine injury, thoracic injury and thoracolumbar injury), type of fracture was assessed according to the AO classification[11] and neurologic deficit.

The sample size was calculated using the previous proportion of cervical spine injury 20.2%, absolute precision 7% and confidence level 95%. Non probability consecutive sampling was used.

All the data was entered and analyzed with the help of IBM SPSS 20. Qualitative data were presented as frequencies and percentages and quantitative data were presented were Mean + SD. Chi Square test was applied for assessing the categorical variables keeping value of $p \leq 0.05$ as significant.

RESULTS

This study was performed on 127 patients presenting with spinal injuries. The mean age of the patients in our study was 33.28±9.63 years. Majority of the patients in this research were from the age group of 18 to 35 years. According to the gender distribution male predominance was observed in this study. There were 88 (69.3%) males and 39 (30.7%) females in our study. Regarding the etiology of spinal injuries 39 (30.7%) patients had road traffic accidents, fall from height were reported by 64 (50.4%) patients, the rest of etiological distribution can be seen at table no 1.

Table 1: Etiology of spinal injuries

Etiology	Frequency	Percent
Road traffic accident	39	30.7
Fall from height	64	50.4
Sports injury	13	10.2
Fire arm injury	11	8.7
Total	127	100.0

Table 2: Level of injury

Level of injury	Frequency	Percent
Thoracolumbar spine injury	63	49.6
Cervical spine injury	38	29.9
Thoracic	26	20.5
Total	127	100.0

Table 3: Type of fracture

Type of fracture	Frequency	Percent
A	55	43.3
B	47	37.0
C	25	19.7
Total	127	100.0

Table 4: Association of type of fracture with neurologic deficit

		Neurologic Deficit		Total	P value
		Yes	No		
Type of fracture	A	31	24	55	0.0001
		44.9%	41.4%	43.3%	
	B	28	19	47	
		40.6%	32.8%	37.0%	
	C	10	15	25	
		14.5%	25.9%	19.7%	
Total		69	58	127	
		100.0%	100.0%	100.0%	

Thoracolumbar spine injury was observed most common level of injury seen in 63 (49.6%) patients. Cervical spine injury was seen in 38 (29.9%) patients and thoracic spine injury was seen in 26 (20.5%) patients. According to AO classification of spinal fractures, type A was seen in 55 (43.3%) patients, type B was seen in 47 (37%) patients and type C was seen in 25 (19.7%) patients. Association of type of fracture with neurologic deficit can be seen at table no 4.

DISCUSSION

The consequences of spinal injury may last for the remainder of the patient's life. Every element of life is impacted by it. Spinal cord injuries have devastating effects on sufferers and their loved ones. Permanent incapacity from spinal cord injury can lead to complete and partial paralysis and loss of motor sensors, it can affect the patients system that control bowel movement, bladder, heart rate and blood pressure. Spinal injuries that result in spinal cord damage pose an enormous financial liability on the families of the patients[13]. For developing and underdeveloped nations such economic burden becomes unbearable and unaffordable for majority of the families due to the financial constraints.

Apart from the financial burden, another important factor of spinal cord injury is its psychological effect on the patient and their families, the patient can go into chronic depression and can develop severe anxiety. A study reported that in patients with spinal cord injury the chances of onset depression and anxiety increases twice. New cases of depression and anxiety were shown to increase by a factor of 2 or more in one study of patients with traumatic spinal cord injuries. A study observed that individuals from socioeconomically deprived backgrounds were shown to be at a higher risk of developing depression.[14]

In our study, patients mean age was 33.28±9.63 years. Majority of our patients were male which accounted for 69.3% of the total patients presented. A study[14] has reported male predominance in their study having 68.7% males and 31.3% females. In their study the mean age was 50.9 years, in our nation the life expectancy is lower than the west. The global fact that the male population is at higher risk of spinal injuries is due to the nature of the occupation which puts them at high risk majority of the uneducated or low qualified males take up as their only source of income[3].

According to the etiology of the spinal injury in our study we found that majority cases were due to falling from height 64 (50.4%) followed by road traffic accidents which accounted for 39 (30.7%) of the total cases. Sports injury were 10.2% and fire arm injuries were 11 (8.7%). A study[12] conducted in Pakistan reported that majority of the patients of spinal injury were presented with etiology of fall from height which comparable to our results. Other studies have shown that road traffic accidents were the major cause of spinal injuries[14, 15]. A study[3] reported that in developing nations frequent cause of spinal injuries were falls from the height while in developed nation the most common cause of spinal injuries was road traffic accidents. Our results are attested by the fact that our study was conducted in a developing country where majority of the people are either skilled workers or unskilled workers working for construction companies or private contractors.

According to the site of injury assessed in our study we found that the most observable site of injury was thoracolumbar spine injury which was seen in 49.6% of the patients followed by cervical spine injury which was seen in 38 (29.9%) patients and thoracic spine injury was reported in 26 (20.5%) patients. Our results are in comparison with the aforementioned Pakistani study[12] which reported that the most common location of injuries were thoracolumbar spine injuries followed by cervical spine injuries. In contrast to our findings a study reported that cervical spine injuries were more common.[3]

In our study the most frequent fracture type observed was type A fracture which was seen in 43.3% patients followed by type B fracture 37% and type C was seen in 19.7% patients. A study[15] reported that the most common type of fracture in their setup was type A fracture. In comparison to our results the aforementioned Pakistani study[12] also reported type A fracture was the common type of fracture reported.

We found that neurologic deficit was more common in type A fractures 44.9%. In patients with type B fractures neurologic deficit was seen in 40.6% patients and in patients with type C fractures neurologic deficit was observed in 14.5% patients. The association between neurologic deficit and type of fracture was statistically significant.

CONCLUSIONS

From our study we conclude that fall from height is the most cause of spinal traumas in our country and

road traffic accidents are the second leading cause. Thoracolumbar spine injury was the major presentation of the spinal injury location and type A was the most common type of fracture. We suggest that strict safety policies must be implemented by the government and policy makers in workplaces where occupational hazards could be a great deal of risk for the workers. We also put strong emphasis on abiding traffic rules for minimizing the RTA.

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