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Original Research Article

A STUDY ON THE PATTERN OF SPINE TRAUMA IN PATIENTS PRESENTED TO KHYBER TEACHING HOSPITAL

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Abstract: *This study was conducted to assess the pattern of spine trauma in patients presenting to Khyber Teaching Hospital in terms of etiology, level of injury, type of fracture, and neurologic deficit. This cross-sectional study was conducted at the Department of Orthopedic Surgery at Khyber Teaching Hospital, Peshawar. Patients presenting with spinal cord injuries were included. Etiology, level of injury, types of fracture, and the neurologic deficit were recorded and assessed. The Chi-square test was used to assess the association. 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%). Most patients had type A fractures 43.3%), and type B (37%) was the second leading fracture. The neurologic deficit was seen in 54.3% of patients. Fall from height is the most common cause of spinal traumas in our country, and road traffic accidents are the second leading cause. Thoracolumbar spine injury was the primary presentation of the spinal injury location, and type A was the most common type of fracture. The majority of the patients had a neurologic deficit.*

Keywords: Spinal Cord Injury, Neurology, Etiology

Introduction

Spinal column fractures signify a small quantity of all fractures from traumatic injury with an occurrence up to 23 % (Schweickert and Kress, 2011; Schweickert et al., 2009). An injury to neurological structure frequently leads to partial or complete paralysis, and disruption of the spinal column can potentially cause instability, discomfort, and impaired function. However, 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 (Kumar et al., 2018). 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 (Izzo et al., 2019).

According to reports, nearly 30% of polytrauma individuals in the industrial nations had spinal injuries (Bühren, 2003). Road traffic accidents and falls from heights are the two major causes of spinal injuries, with traffic accidents being more common (Birua et al., 2018). Injury to the thoracolumbar spine was more frequent than trauma to the cervical spine. The preponderance of patients who have suffered from spinal injuries are polytrauma sufferers, and the probability of spinal injuries is closely associated with the severity of the first trauma (McRae et al., 2023).

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 (Abozaid et al., 2020). The best way to understand spine injuries is to consider the spine comprising five separate anatomical zones, each with its own anatomy and injury patterns. 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 (Pepke et al., 2019).

The significance of initial stabilization in keeping with the ATLS protocol in these settings cannot be overstated. Mechanical or neurological instability determines the choice of corrective surgery (Schmidt et al., 2009) despite initial patient stabilization.

The implications of spinal injury may last around a 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 pattern of spinal injuries in terms of etiology, fracture types, and level of spinal cord injury in our local health setup.

Methodology

This cross-sectional study was conducted at the Orthopedic Department of Khyber Teaching Hospital, Peshawar, from 1 July 2022 to 30 March 2023. After gaining ethical approval from the hospital's ethics board, the study was conducted on 127 patients presenting to the emergency orthopedic unit for spinal cord injuries. All the patients were subjected to clinical examination 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 classification11 and neurologic deficit.

The sample size was calculated using the previous proportion of cervical spine injury of 20.2%, the margin of error of 7%, and a confidence interval of 95%. Non-probability consecutive sampling was used.
All the data were analyzed using IBM SPSS 20. Categorical variables are presented as frequencies and percentages, and numerical data are presented as Mean and SD. The Chi-Square test was applied to assess the categorical variables, keeping a P value ≤ 0.05 as statistically significant.

Results

This study was conducted on 127 patients presenting with spinal injuries. The mean age of the patients in our study was 33.28±9.63 years. The majority of the patients in our study belonged to the age group of 18 to 35 years. According to the gender distribution, male predominance was observed in our study. There were 88 (69.3%) males and 39 (30.7%) females in our study (Figure 1). Regarding the etiology of spinal injuries, 39 (30.7%) patients had road traffic accidents and falls from height were reported by 64 (50.4%) patients; the rest of the etiological distribution can be seen in Table 1. Thoracolumbar spine injury was the 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 the 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. The association of the fracture type with neurologic deficit can be seen in Table No. 4.

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
Firearm injury	11	8.7
Total	127	100.0

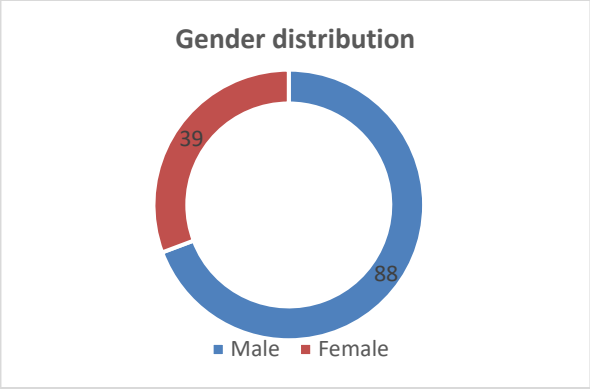

Figure 1: Age distribution of the study population

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%	

Discussion

The consequences of spinal injury may last for the remainder of the patient's life. Every element of life is impacted by it. For patients and their families, spinal cord injury has the potential to alter their lives completely (Satar et al., 2018). 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 controls bowel movement, bladder, heart rate, and blood pressure. Spinal injuries that result in spinal cord damage put a substantial financial burden on the families of the patients (Chiu et al.,

2010); for developing and underdeveloped nations, such an economic burden becomes unbearable and unaffordable for most families due to financial constraints.

Apart from the financial burden, another critical factor of spinal cord injury is its psychological effect on the patient and their families; the patient can go into chronic depression and develop severe anxiety. A study reported that in patients with spinal cord injury, the chances of the onset of depression and anxiety increase twice (Magerl et al., 1994). One study estimated around a 2-fold increase in new-onset depression and anxiety in patients with traumatic spinal cord injury. They reported that patients with a low socioeconomic background are more at risk of depression (Krueger et al., 2013).

In our study, the mean age of the patients was 33.28±9.63 years. Most of our patients were male, accounting for 69.3% of the total patients presented. A study14 has reported male predominance, 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 in the West. The global fact that the male population is at higher risk of spinal injuries is due to the nature of their occupation, which puts them at the high-risk majority of the uneducated or low-qualified males take up as their only source of income (Kumar et al., 2018).

According to the etiology of the spinal injury in our study, most 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 injuries were 10.2%, and firearm injuries were (8.7%) (Magerl et al., 1994). A study12 conducted in Pakistan reported that the majority of the patients with spinal injury were presented with the etiology of fall from the height, which is comparable to our results. Other studies have shown that road traffic accidents were the primary cause of spinal injuries (Kawu, 2012; Krueger et al., 2013). A study reported that in developing nations, the most common cause of spinal injuries is falling. In contrast, in developed nations, the most common cause of spinal injuries is road traffic accidents. Our results are attested by the fact that our study was conducted in a developing country where most people are either skilled workers or unskilled workers working for construction companies or private contractors.

According to the location of injury assessed in our study, we found that the most common location 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 study12, 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 (Kumar et al., 2018).

In our study, the most common type of fracture observed was type A fracture, seen in 43.3% of patients, followed by type B fracture in 37% and type C in 19.7%. A study15 reported that type A fracture was the most common type in their setup. Compared to our results, the aforementioned Pakistani study12 also reported that type A fracture was the most common type of fracture reported. The neurologic deficit was more common in type A fractures at 44.9%. In patients with type B fractures, a neurologic deficit was seen in 40.6% of patients, and in patients with type C fractures, a neurologic deficit was observed in 14.5% of patients. The association between neurologic deficit and type of fracture was statistically significant.

Conclusion

From our study, we conclude that falls from height are the most common cause of spinal traumas in our country, and road traffic accidents are the second leading cause. Thoracolumbar spine injury was the primary presentation of the spinal injury location, and type A was the most common type of fracture. We suggest strict safety policies must be implemented by the government and policymakers in workplaces where occupational hazards could be a great deal of risk for the workers. We also strongly emphasize abiding by traffic rules to minimize the RTA.

Declarations

Data Availability statement
All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate
Approved by the department Concerned.

Consent for publication
Approved

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Conflict of interest

The authors declared absence of conflict of interest.

Author Contribution

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