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Causes of Traumatic Spinal Cord Injury with Gender Distribution and Most Commonly Affected Age Group

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ABSTRACT

Background: Spinal cord injury (SCI) has significant consequences, especially for young adults, requiring comprehensive support. Additionally, non-traumatic SCI is under-researched in Pakistan, highlighting the need for further investigation. Managing readmissions post-discharge remains a global challenge for SCI patients. This study conducted at Paraplegic Centre Peshawar aims to find the traumatic causes of spinal cord injury with gender and age distribution.

Methods: A retrospective study was conducted at Paraplegic Center in Hayatabad and Prime Teaching Hospital, Peshawar. Over two months, 1843 patients were recruited from hospital records with permission from the department head. Data collection forms were designed to include age, gender, and cause of SCI, ensuring confidentiality by excluding personal identifiers. SPSS-V19 was used for data analysis.

Results: Our study included 1843 patient records, with males comprising 80.7% and females 19.3%. Among different age groups, individuals aged 30 and older represented the highest proportion at 52.7%. The primary causes of spinal cord injury were falls from height (46.3%) and firearm injuries (25.9%). Paraplegic injuries were more prevalent, accounting for 87.9% of cases compared to quadriplegic injuries at 12.1%. These findings shed light on the demographics and patterns of spinal cord injuries, providing valuable insights for healthcare management and prevention strategies.

Conclusion: Falls are major cause of spinal cord injury (SCI). Mean age patients suffers are 26. frequency of SCI is more in males then females. Paraplegia is more common then quadriplegia. The socioeconomic impact of SCI is eminence because it is affecting the youth population. It is important to understand the epidemiological features of SCIs which could lead to plan appropriate cost-effective prevention strategy in order to reduce the SCI prevalence and incidence in our community.

Keywords: Spinal Cord Injury (SCI, Demographics, Mortality Rates, Paraplegia, Quadriplegia.

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INTRODUCTION

Spinal cord injury (SCI) represents a significant health challenge with far-reaching physical, emotional, and socioeconomic consequences.[1] But not predominately like other injuries, however its affect on life of individuals are very dominant, resulting in lifelong impairments and disabilities. It is observed that complete recovery after SCI is rare, moreover, patients leads to limited physical and psycho-social activities.[2] A study conducted in United State, where road traffic accidents (RTA) are commonly observed a ethological factor of SCI,[3] which emphasize the valuable primary prevention strategies.[4] A global organization such as International spinal cord society (ISCos) have started plan to overcome the SCI throughout world-widely, focusing on the comprehensive coordination and data for planning the strategies.[5, 6] Although efforts are under process to address these ethiological factors but still SCI is one most significant public health issue after septicemia, suicides, pneumonia, and heart diseases among the mortility and morbidity with severe disabilities such as paraplegia and tetraplegia.[7]

Young age people between 15 and 35 are more affected with SCI, which a great concern for country socioeconomically and also a broad range of health concerns, from pain, musculoskeletal impairments to sexual and bowel abnormalities.[8] Moreover, emotionally and psychologically also SCI takes on affected individuals, who working hard with loss of dignity, despair, and difficulties facing in finding the jobs.[9] Social impact and resilience may reduce this severe impairments by starting the new therapeutic strategies in order to improve the quality of patients life.[10] Moreover, SCI frequently occurred due to the accidents including gunshot injuries or road accidents

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which can cause a lifelong disorder in the sense of physical moverment and other abnormalities of lower limbs.[11]Few research studies available on traumatic and non-traumatic SCI and both have its own difficulities and complications which need further workup to specify the treatment.[12] Post stressful stress Disorder is one of the most common SCI in patients which caused due to the severe stress environment such as accidents. Research studies are lacking based on the therapies of impairments like cognitive behavioral therapy (CBT) among patients suffering from SCI in developing nations including Pakistan.[13]

Additionally, it is also observed that patients suffering from SCI experiences hospital readmission, which further extend the difficulties in post discharge management and care. Therefore, a comprehensive strategies are required to tackle such hurdles which affecting the cause, occurrence, and consequences of SCI.[14] In the light of these reasons, it is important to clarify these factors to improve SCI patient care, personalized reatments, and strengthen legislative efforts to reduce the complexity raised with SCI.[15] This study was conducted at Paraplegic Centre Peshawar aims to find the traumatic causes of spinal cord injury with gender and age distribution.

METHODS

This retrospective study was conducted in duration of two year from January 2019 to 2021 at the Paraplegic Center of Hayatabad, and Prime Teaching Hospital, Peshawar. A total of 1843 patients were recruited in the study through non-probability convenient sampling technique. Before recruiting the patients, consent form was taken after explaining the study aims, purpose and objective in local language. Moreover, an ethical approval was also obtained from the hospital before conducting the study.

The demographic, clinical history and other characteristics of spinal cord injury (SCI) patients were obtained through designed questionnaire. Data collection questionnaire were designed to anonymize the patient name or any other information, just focusing on gender, age, and the causes of Spinal Cord Injury. All information were kept confidentiality through taking strick measurement to keep patient privacy.

The collected data were entered and analyzed through statistical package for social analysis version 19 (SPSS-V19) software. Descriptive analysis performed and data presented in the tables form for better presentation.

RESULTS

A total of 1843 records of patients were included in our study. Among these males:1488 (80.7%) and females: 355 (19.3%). Males were more sufferer then female 80.7% (Table 1). The most common cause of spinal cord injury was fall from height n=854 (46.3%) followed by fire arm injury n=477 (25.9%) (Table 2). Patients were also categorized in different groups as per type of injury including paraplegic and quadriplegia. Paraplegic injury found in 87.9% patients while quadriplegic injury found in 12.1% (Figure 1).

Table 1: Frequency of SCI in different age and gender groups

Gender	Frequency	Percent
Male	1488	80.7
Female	355	19.3
Total	1843	100
Age (Years)		
1-12 years	61	3.3
12-19 years	222	12.0
20-29 Years	588	32.0
30 & Onward Years	972	52.7

Table 2: Cause of spinal cord injury

Cause	Frequency	Percent
Pathological	49	2.7
Falls	854	46.3
RTA	421	22.8
FAI	477	25.9
Others	42	2.3
Total	1843	100.0

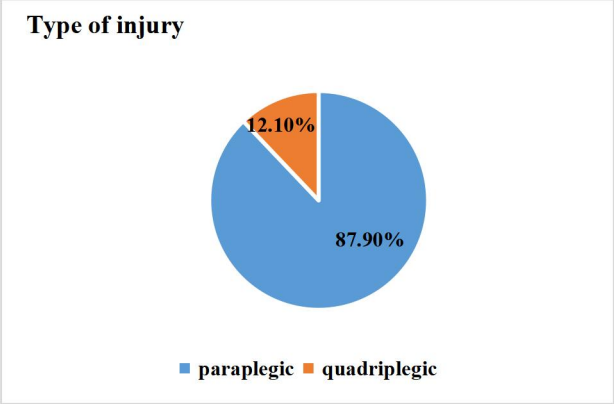

Figure 1: Types of injury; Paraplegic and Quadriplegic

DISCUSSION

The findings of this study underscore the significant impact of falls as the primary cause of spinal cord injury (SCI) within the study population. This corroborates with previous research conducted by scholars such as Qureshi *et al.,* who have also identified falls as a predominant contributor to SCI. The geographical distribution of falls, primarily observed in hilly regions like Lower Dir, Upper Dir, Chitral, and Swat, accentuates the influence of environmental factors on injury occurrence.[10]

Furthermore, consistent evidence from studies conducted across diverse locations worldwide strengthens the significance of falls as a leading cause of SCI.[16] Falls are the most frequent cause of SCI in

each of the three areas where Picket *et al.,* (Ontario, Canada)[16], Karamehmetoglu et al. (Istanbul, Turkey)[17], and Maharaj *et al.,* (Fiji Islands)[18] have published findings. These results highlight how often falls are as a leading cause of SCI that cuts across national borders.[14, 17] More male participants were observed as compared to female SCI patients, this could be due to social issue, where male get more exposed to RTA and falls from heights as male are working more outside home.[19] Secondly, it might be to ignoring for female for visiting rehab center due to social and cultural issues, because female healthcare professionals are not available for female patients in this regions.[20]

This study findings were inconsistent with other research outcome, as road traffic accidents were the second common cause of SCI in present study. Maharaj *et al.,* and Dryden *et al.,* reported RTA as most common risk factor for SCI in their studied regions.[3, 18, 21] Another study performed by Knotsdottir et al., reported RTA is second mostly common cause of SCI, followed by the falls.[14, 15, 21]

These consistent outcome of different studies in different region of the world highlight the most common cause of SCI which fall, followed by RTA. Both need prevention techniques and road traffic safety. Policy makers and health care provider need to focus on prevention strategy and treatment plan in order to lessen the SCI cases and to enhance the well being of individuals exposed to falls and RTA.[22] Moreover, comprehensive awareness and prevention programs are required about the common causes of SCI in our regions particularly the traffic safety and falls from heights. Further studies are required to determined the potential prevention and post SCI treatment suited to this study population. It is to mentioned here that on single rehab center serving for SCI patients functional and working in Peshawar, which is insufficient to tackle the burden of this populated province of Pakistan. It is crucial to conducted such studies in different hospital of province to determine the actual SCI burden and its prevention strategy.

CONCLUSION

It is concluded with findings of this study that male are affected with spinal cord injury as compared to female. Moreover, falls from height was the leading cause of SCI in this study. Patients with age group 30 or more years are frequently affected with SCI. Additionally, it observed that paraplegia cases for found more than quadriplegia. It is worth to mentioned that younger age population are more affected with this severe disability which have direct impact on socioeconomics of country. It is highly recommended that public awareness regarding the SCI prevention from trauma such as sudden falls from height, and RTA are necessary through electronic, printed and social media.

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