

## AN OBJECTIVE ANALYSIS OF SPINAL CORD INJURY PATIENTS

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### ABSTRACT

**Objective:** To determine the types and causes of Spinal cord injuries presenting to AFIRM and compare them with international data.

**Study Design:** Cross sectional descriptive study.

**Place and Duration of Study:** The study was conducted at the Spinal unit of Armed Forces Institute of Rehabilitation Medicine Rawalpindi from January 2011 to June 2011.

**Material and Methods:** Forty patients of SCI were included in the study. Patients with concomitant neurological injuries were excluded from the study. History and examination of the patients was carried out and demographic data including etiology of injury was noted on proforma. These results were then compared with the National Spinal Cord Injury Statistical Centre (NSCISC) database of the U.S.

**Results:** Forty Patients (mean age 32.37 years +/-10 years) including 31 males (77.5%) and 9 (22.5%) females were sampled. Overall 12 were unemployed (30%) and 28(70%) were employed. Out of the total sample, 7 (17.5%) patients were single and 33(82.5%) were married. 32 (80%) of the patients suffered a traumatic injury and 8 (20%) suffered non traumatic injury. Out of those patients suffering from traumatic injury 22 (55%) were army personnel.

**Conclusion:** Young, male, patients suffering traumatic SCI dominated the study. This is because most of the patients reporting to our centre were active duty military personnel presenting with these demographics. These results are comparable with the NSCIS data of the U.S. for some parameters but quite different in others. This means that we need to develop our own data base for spinal cord injury statistics in order to improve our services at a national level.

**Keywords:** AFIRM, Demographics, Spinal cord injury.

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### INTRODUCTION

Spinal cord injury (SCI) is one of the most devastating and debilitating injuries that an individual can suffer. The increased frequency of natural disasters and terrorist activities has exponentially increased the toll of this injury in our country. Since Pak Army is involved in fighting this menace at the front lines, therefore it is also bearing the largest burden of such injuries. The spinal cord is an extension of the central nervous system, extending from the medulla oblongata till the lower border of L 1 vertebra in adults<sup>1</sup>. It is housed in the bony canal formed by

the articulating vertebrae of the vertebral column, giving it protection and stability. The overall incidence of traumatic SCI in the U.S. is 40 new cases per million population, or just over 11,000 cases per year. Men suffer traumatic SCI much more commonly than women. Approximately 60% of persons between the ages of 16 and 59 are employed at the time of injury. Motor vehicle crashes (MVCs) rank first followed by acts of violence (primarily gunshot wounds, or GSWs), falls, and recreational sporting activities. Traumatic SCI most commonly causes cervical lesions (approximately 50%) followed by thoracic and then lumbosacral lesions<sup>2</sup>.

Spinal cord injury is an insult to the spinal cord resulting physical and functional deficits such as paralysis, bladder incontinence and sexual dysfunction. Spinal cord injuries can lead

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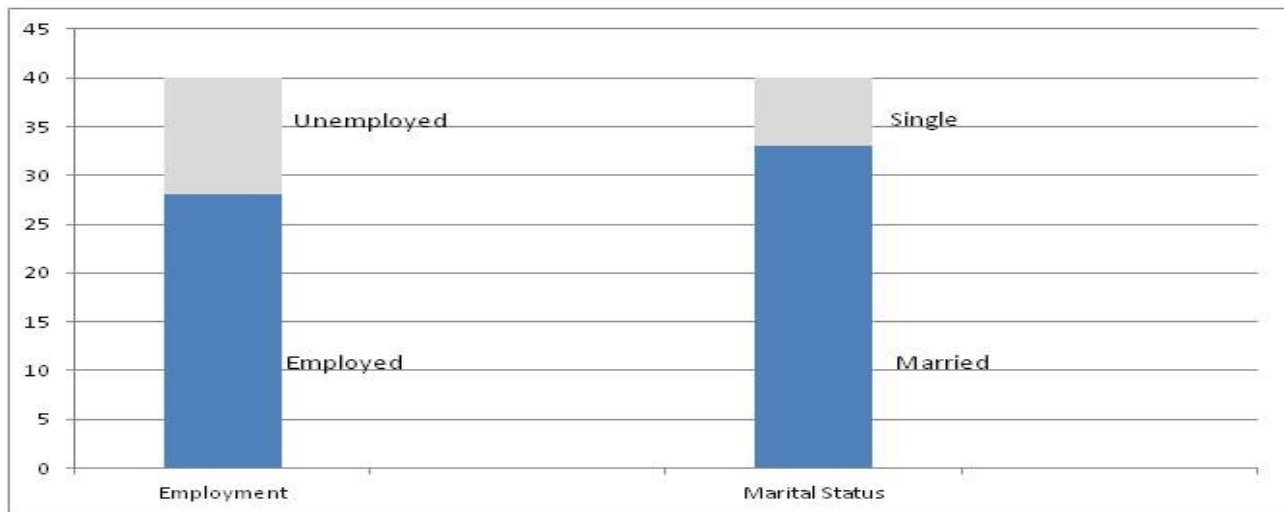
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to a cluster of signs and symptoms. Its clinical features are influenced by the level at which it is damaged. Damage to upper motor neuron axons in the spinal cord results in a characteristic pattern of deficits. These include hyperreflexia, hypertonia and muscle weakness. Lower motor neuronal damage results in muscle weakness,

deep vein thrombosis and pulmonary embolism, respiratory complications and so on. Diseases of the respiratory system are the leading cause of death following SCI, with pneumonia being the most common. Heart disease ranks second, followed by septicemia (usually associated with pressure ulcers, urinary tract, or respiratory

**Table-1: Demographic characteristics of the patients.**

Demographic characteristics	Patients evaluated
Gender	
Male	31
Female	9
Age	32.37 ± 10 years
Youngest	15 years
Oldest	66 years



**Figure-1: Distribution of employment & marital status of the patients.**

hypotonia, hyporeflexia and muscle atrophy<sup>3</sup>. Spinal shock and neurogenic shock can occur from a spinal injury. Spinal shock is usually temporary, lasting only for 24–48 hours, and is a temporary absence of sensory and motor functions. Neurogenic shock lasts for weeks and can lead to a loss of muscle tone due to disuse of the muscles below the injured site<sup>4</sup>.

SCI can also result in a number of complications which can greatly hinder the rehabilitation process. These include orthostatic hypotension, autonomic dysreflexia (a medical emergency), pressure ulcers, hypercalciurea,

infections) and cancer<sup>5-9</sup>. This collection of physical and neurological effects coupled with the above mentioned complications makes spinal cord injury an immensely important ailment to study.

Considering the paucity of data on spinal cord injury in Pakistan, this study aims at bringing the basics of this injury to light so that further work can be done on this subject. Moreover, by comparing our data with that of NSCIS, we can see what sort of challenges we are up against compared with the developed world.

## MATERIAL AND METHODS

This cross sectional descriptive study was carried out at the Spinal unit of Armed Forces Institute of Rehabilitation Medicine Rawalpindi between January 2011 and June 2011 after approval of the hospital's ethical committee. Patients of both genders and all ages that had been diagnosed with SCI and were undergoing rehabilitation at AFIRM were included in this study (using WHO sample size calculator). Patients with concomitant head injury or any other debilitating disease were excluded. Total 40 patients were included in the study. A comprehensive history and clinical exam was conducted for these patients to rule out any other causes and to ensure that cases of pure spinal cord injury are recruited for the study. Besides their basic demographics, etiology and occupations were also noted as they point towards the prognosis of the injury as well. The results were analyzed using SPSS version 17. Descriptive statistics were used to describe the data. Mean and Standard Deviation were used to describe quantitative variables like age. Frequency along with percentages was used to describe categorical variables like gender, marital status, occupation, etiology.

## RESULTS

My study included 40 patients 31 (77.5%) males and 9 (22.5%) females. The average age in all patients was  $32.37 \pm 10$  years. The youngest patient was 15 years and oldest was 66 years old (table-1). Overall 12 (30%) were unemployed and 28 (70%) were employed. Out of the total sample, 7 (17.5%) patients were single and 33 (82.5%) were married (fig-1). Thirty two (80%) of the patients suffered a traumatic injury and 8 (20%) suffered non traumatic injury. Out of the 32 patients suffering from traumatic injury 22 (68.75%) were army personnel.

## DISCUSSION

Spinal cord injury is one those very serious and debilitating injuries which are ignored and not given due consideration. Patients are often told to go home and live their lives in suffering

without hope; so much so that the historical Edwin Smith papyrus describes this as an 'ailment not to be treated'<sup>10</sup>. This attitude is unfortunately prevalent even today in many countries. The recent massive natural disasters and the war on terror have put the spotlight on this injury.

Our study showed that the 77.5% of the patients were males and 22.5% were females. This is not so different from other studies as the National Spinal Cord Injury Statistical Center (NSCISC) database has noted that spinal cord injury occurs in males much more than in females, at a ratio of 4:1. The mean age in our study came out to be 32.37 years which is again almost the same as for NSCISC data, where the average age for spinal cord injury patients was 32.1 years<sup>11</sup>. Moreover, in a study conducted by Rathore FA and colleagues in the same centre in 2006 showed that patients had a mean age of  $29.3 \pm 12.4$  years with 81.9% males and 18.1% females<sup>12</sup>; again these results were comparable. Our patients had a 70% rate of employment compared with the 60% rate in NASCIS study. However, where 82.5% of our patients were married, more than 50% of the patients enrolled in NASCIS were single. 80% of our patients had suffered a traumatic injury. This is also explained by the fact that of these 80%, more than 68% were military personnel involved in operations. A study of non-disaster SCI conducted by Qureshi MA et al also showed that males suffering traumatic injuries were the most common type encountered<sup>13</sup>.

As is evident from the results, our study was dominated by patients who were male, military personnel and suffered traumatic injuries. This is explained by the fact that most patients were from the Army and involved in active operations. This is also the reason why our patients had a higher rate of employment at the time of injury than those inducted in the NASCIS study. The increased frequency of single patients in the NASCIS study can be attributed to the more adventurous nature of young single males

compared with their more mature and married counterparts.

### CONCLUSION

Our study proves that spinal cord injury in a military set up is dominated by young males who suffer traumatic injuries, highlighting the sacrifices being rendered by our soldiers for the defense of the nation. It also puts into focus the dire need to develop a national database for such injuries and to promote the development of more spinal rehabilitation units throughout the country.

### CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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