

Traumatic Spinal Cord Injuries at a Tertiary Care Rehabilitation Institute In Pakistan

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Abstract

Objective: To identify the epidemiological pattern of traumatic spinal cord injuries (SCI) presenting at a rehabilitation institute of a developing country

Methods: Eighty three patients of traumatic SCI admitted at Armed Forces Institute of Rehabilitation Medicine in 2006 fulfilling the inclusion criteria were enrolled. Detailed clinical evaluation and radiological assessment was done along with identification of mechanism of injury, mode of evacuation and presence of associated injuries. Data analysis was done in January 2007 and results were compiled and analyzed using SPSS 13.

Results: There were 68(81.9%) males and 15(18.1%) females. Mean age was 28.3 ± 12.4 years. Majority of the patients were in their second decade 43 (51.8%) years. Ambulance evacuation was carried out in only 18 (22.2%) patients and none received any spinal trauma first aid and log roll at the injury site. Most of the patients were paraplegics 49 (71.1%), 48 (57.8%) had complete injury and 43 (51.8%) spinal fixation. Fracture dislocation was the predominant vertebral column injury in 25 patients. Associated injuries and problems were present in 49.4% patients.

Conclusion: Epidemiology of SCI in a developing country has unique epidemiological features and problems, which is different from a developed country. This was to be considered while formulating a plan for SCI management and rehabilitation. There is a dire need to establish a SCI registry in Pakistan, in order to improve the spinal trauma evacuation protocols and develop spinal rehabilitation centers (JPMA 58:53;2008).

Introduction

Spinal cord injury (SCI) is one of the most devastating conditions known to mankind. In a developing country like Pakistan, where chronically disabled are looked down upon and rarely move in the society as a useful member, having a traumatic SCI is a great misfortune. There is no national SCI registry in Pakistan at present. Therefore, there is no accurate assessment of the number of individuals who suffer from SCI in Pakistan every year. The research on epidemiology of traumatic SCI in Pakistan is very limited. So far there are only few studies published on this topic in indexed and local literature.¹⁻⁴

SCI require specialized surgical intervention initially and a comprehensive rehabilitation afterwards.⁵ Spinal units were established in the West as early as World War II, which was dedicated to the treatment and rehabilitation of SCI patients in order to manage their needs in a comprehensive manner.⁶ Most of the SCI patients in West are treated in these centers. Unfortunately, this was never a priority for governments and health professionals in Pakistan. Although neurosurgical departments are established in nearly all the major teaching hospitals of the country, spinal units employing a multidisciplinary approach are missing. Paraplegic centre at Hayatabad, Peshawar is making commendable efforts to address this; however, the main emphasis is on Physical therapy alone.

In Pakistan SCI is initially managed by neurosurgeons, spinal surgeons and in some cases even by orthopaedic surgeons in general surgical wards. Majority of the patients are discharged with only an advice for physiotherapy and exercises. Dedicated spinal rehabilitation units are conspicuously missing and spinal rehabilitation consultations are rarely made. Social support systems for paraplegics are missing and a patient of SCI very rarely goes back to main stream society.

This study was carried out to determine the epidemiological features of traumatic SCI in a developing country with reference to etiological factors, most common age group involved, level of injury, mode of evacuation, time for initial surgical consultation and management done.

Patients and Methods

This was a prospective observational study conducted at the Spinal unit, Armed Forces Institute of Rehabilitation Medicine (AFIRM) Rawalpindi from 1st January 2006 to 31st December 2006. Study was approved by the hospital administration.

AFIRM is the largest rehabilitation facility/ institute in the country. It is a 100-bed tertiary care referral institute. Specialists in Physical Medicine and Rehabilitation are managing it with a team of physical therapists, occupational therapists, speech and language pathologists, rehabilitation

nurses, orthotists and prosthetist. The spinal rehabilitation protocols and services provided indoor and outdoor includes, prevention of pressure ulcers, daily individual and group exercises programme, transfer training, gait training, wheel chair mobility skills, management of neurogenic bladder and bowel, psychological support and counseling sessions, patient and family education, and follow up in selected cases

AFIRM primarily caters for the armed forces personals and their dependents and provides treatment to them free of cost but civilians can also avail the rehabilitation services by paying nominal charges.

Patients of all ages and both genders, with new SCI presenting within two months of injury in which etiology of SCI could be attributed to trauma, irrespective of the mechanism (RTA, falls etc) were included in the study.

Patients having spinal cord dysfunction secondary to central nervous system lesion (multiple sclerosis, pyogenic meningitis etc) or vascular insults e.g. anterior spinal artery thrombosis were excluded. And so were the patients readmitted for a complication of Chronic SCI.

Eighty-three patients admitted to our institute in the year 2006 fulfilling the admission criteria were enrolled in the study. Oral Informed consent was obtained from the patients (and in cases of minors < 16 yrs from their Parents/guardians) at the start of the study.

At the time of admission patients were evaluated in detail by obtaining a complete history, demographic data, time and mode of evacuation, identification of mechanism of injury, educational and marital status, associated problems/injuries, level and nature of injury and radiological evaluation and management done. X rays were performed in all cases and computed tomography and magnetic resonance imaging of the spine was carried out in selected cases. Diagnosis of SCI was already made at the time of admission on the basis of clinical findings and radiological evidence. The patient who had clinical diagnosis of spinal cord injury with no abnormality on X-rays and CT scan, were labeled as SCIWORA (Spinal cord injury without Radiological Abnormality). The severity and neurological level of the injury were determined by American Spinal Injury Association (ASIA) classification of SCI, which is a widely accepted system describing the level and the extent of injury based on a systematic motor and sensory examination of neurological function.⁷ The ASIA scoring had not been carried in most of the patients coming from civil setup.

The patients with acute SCI do not present to AFIRM. All the patients were transferred or referred from other health care facilities, so emphasis was placed in identifying complications (specifically pressure ulcers)

already present at the time of admission. Patients were assessed in detail fortnightly for improvement in the clinical status and development of secondary complications of SCI particularly detection of pulmonary embolism, deep vein thrombosis (DVT), pressure ulcer formation, urinary tract infections (UTIs), spasticity, depression and neuropathic pains.

Data collected was entered in proformas designed specifically for the study and record was maintained on two separate computers. Data was compiled in Jan 2007 and results were analyzed using SPSS 13. Descriptive statistics were used to compute age, gender and etiology distribution.

Results

Eighty three patients were included in this study with a mean age 29.3 ± 12.4 (range 8-71) years with 68 (81.9%) males: mean age 31.3 ± 11.9 and 15 (18.1%) females: mean age 27.5 ± 11.8 years. Most of the patients were in the second and third decade of life. Majority (75.9%) of the patients were married at the time of injury.

Falls from different causes was the most common etiology accounting for 48 SCI followed by RTA (25.2%) and fire arm injuries (8.4%) (Figure 1).

Only eighteen patients (22.2%) were fortunate to get an ambulance for evacuation from the site of injury and the remaining were transported in cars, jeeps and transport vehicles. One of the patients was brought to the hospital on a bullock cart. Spinal board was not used and spinal trauma evacuation protocols were not followed in even a single patient in transportation from the site of injury.

At the time of admission 15 (18.1%) patients were having incomplete paraplegia, 44 (53.0%) had complete paraplegia, 18 (21.7%) had incomplete quadriplegia, 4 (4.8%) had complete quadriplegia while 2 (2.4%) had no

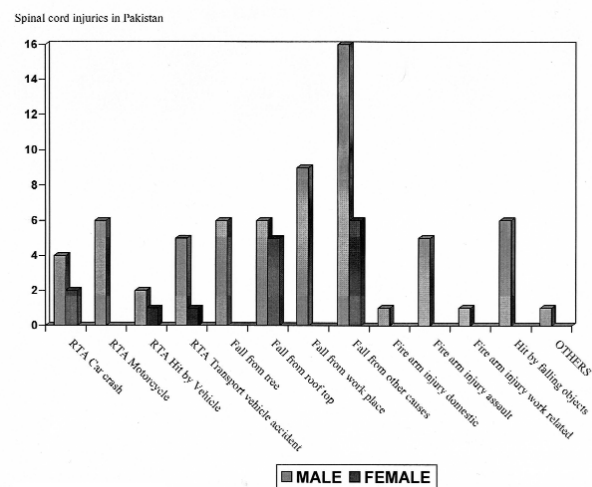


Figure 1. Etiology of SCI.

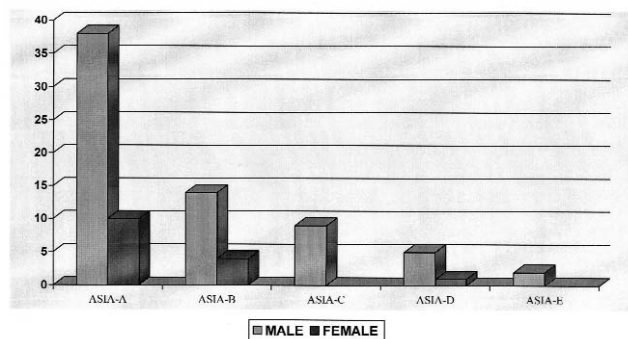


Figure 2. ASIA scoring at presentation.

Table. Vertebral column injuries (n= 80†).

Type of Bony Injury	Gender		Total
	Male	Female	
Fracture	7	1	8 (10.0%)
Dislocation	6		6 (7.5%)
Fracture dislocation	17	8	25 (31.3%)
Burst fracture	13	2	15 (18.8%)
Compression fracture	13	2	15 (18.8%)
Sciwora	8	1	9 (11.3%)
Sub luxation	1	1	2 (2.5%)

SCIWORA: spinal cord injury with out radiological abnormality

† N= 80 because type of vertebral damage was unknown in 03 patients.

neurological deficit. Complete paraplegia was the commonest presentation both in males (35= 51.4%) and females (9= 60%).

Out of the 33 patients having incomplete injury. 18 were in ASIA B, 09 were ASIA C and 06 were placed in ASIA D (Figure 2),

In most of the patients (59.8%) trauma resulted in SCI at low thoracic (T7-T12) level. Cervical lesions were the next common with nineteen males and two females (total 25.6%) followed by high thoracic (T1-T6) lesion in nine (11.0%) patients.

Radiologically, fracture dislocation was the commonest type (31.3%) of bony injury followed by burst and compression fracture being 18.8% each (Table).

Forty-three patients (51.8%) underwent surgery for spinal fixation and forty (48.2%) patients were managed conservatively. Majority of the females were operated (10). Management was nearly equally divided in males i.e. 33 spinal fixations and 35 conservative managements.

Associated injuries and problems were present in forty-one (49.4%) patients. It included head injury in 18 (21.7%), chest trauma in form of rib fracture and

pneumothorax in 14 (16.9%) and abdominal injuries in 5(6.0%) patients. Five patients had co-existing disorders unrelated to SCI and it included morbid obesity, diabetic foot, blind eye, kyphosis and benign prostatic hypertrophy in one patient each.

Pressure ulcers were present in thirty three (39.7%) patients at the time of admission to our institute, while only two (2.4%) patients developed pressure ulcers during their stay at this facility.

Discussion

Epidemiological studies of SCI in the last two decades have consistently shown a male predominance ranging from M: F ratio of 4:1 in the developed world⁸⁻¹⁰ to 13.5:1 in the developing countries.^{2,11-13} Results from this study are no different. In male dominant societies like ours women are considered relatively safe, as they are not exposed to outdoor dangers as men.¹⁴ Most of the women in this study were uneducated and married. With the exception of two females who were school teachers rest all were house wives. Men being exposed to out door risks, poor working conditions with no regards for worker safety protocols and an increasing number of motor vehicles in Pakistan in the last few years are nature's preferred candidates for traumatic SCI.

As regards to initial management; steroid infusion which is an established norm in the management protocol of acute SCI in the West is not routinely followed in Pakistan partly because of financial constraints and partly because of lack of knowledge on the part of doctors and health care professionals involved in the acute management of these patients. The only rehabilitation intervention available to a minority of patients during first weeks after injury was indoor physiotherapy and that too without the involvement/consultation of a qualified rehabilitation physician

Majority of the patients admitted at our institute were either uneducated (17) or were minimally educated (31). These patients were the most difficult to counsel. They either did not understand or try not to understand about the grave nature of their disability and its long term consequences. As a result the commonest question asked by them was "when will be I able to walk again?" "Many of them did not take "NO" or "Never" as an answer and in case the actual prognosis was explained went on to explore alternative modes of treatment in form of faith healing, spiritual healers, local traditional hakims and homeopathy.

Falls as the leading cause of SCI have been reported from developing countries like Bangladesh¹¹, Turkey¹⁴, India¹⁵, Nigeria¹⁶ and Nepal¹⁷ and developed countries like United Kingdom¹⁸ and Canada.¹⁹ Falls from other causes were the commonest etiological factor of SCI in this study.

It included falls into open wells, falls from stairs, from vehicles, and from electricity poles after electrocution. It was followed by fall from roof tops and falls from work places. It sheds light on the lack of awareness on the part of general public and absence of safety education programmes on the part of government. Road traffic accidents, which are the leading, cause of traumatic SCI in the West⁸⁻¹⁰ was the second commonest etiology with 21 patients.

Another aspect which has been highlighted by this study is the poor system of spinal trauma evacuation in the country. Ambulance evacuation to hospital was available to only 18 patients. Not even a single patient was provided with spinal board, which is the standard of care of a spinal injured patient in the west.²⁰ Immobilization of the spine is mandatory in order to avoid inciting secondary neurological damage.²¹ This again was conspicuously missing with patients being lifted carelessly and being transported in all kinds of vehicles ranging from vans and bus to taxi and even bullock cart in one case. Similar observations have been reported from India.¹⁵

As in most of the previous studies^{1-3,8,12-15} a relatively younger population in the second and third decade of life was predominately affected. In this age group life is characterized by high risk activities such as rash driving, climbing on trees and on moving vehicles resulting in an increase risk for SCI. This age group represents the most productive years of one's life, hence the need for a comprehensive spinal rehabilitation programme to ensure transition back into mainstream society.

At the time of admission, 39% patients already had pressure ulcers. The etiological factors were the same as observed by our team during spinal cord injury management and rehabilitation in Oct 2005 earthquake i.e. lack of knowledge regarding pressure ulcer prevention on part of the doctors' inadequate change of posture' nonavailability of pressure-relief mattresses in the acute phase of management and delay in identification of early signs of skin breakdown.¹

This clearly reflects a casual attitude towards pressure ulcers recognition and prevention in our health care professionals. The low incidence of paediatric SCI in our study group conforms to similar observations from west.²²⁻²⁴

There are two limitations of this study. First that it is a hospital based study which may not be truly reflective of trends of SCI in general population. Secondly being a referral rehabilitation institute we don't receive acute SCI. Had this study been carried out in acute traumatic SCI, may be the type of injury, ASIA score at presentation, associated complications would have been different.

Conclusion

Spinal cord injury is not being given due importance in Pakistan. Para medical staff and doctors lack an understanding of the spinal trauma evacuation protocol and the use of spinal boards is not the routine. Log roll is seldom followed while transporting SCI patients from the accident site and in the hospital. Spinal rehabilitation consultation is not made routinely and leads to inadequate functional outcomes. There is a need for large scale epidemiological survey in the county to assess the actual incidence, prevalence and etiological factors of the one of the most crippling conditions known to mankind. It is also recommended that medical first aid system and emergency evacuation protocols be developed. Development of spinal units on regional basis, with a multidisciplinary team is also need of the day.

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