

# Spine injuries in a tertiary health care hospital in Jammu: A Clinico - Epidemiological Study

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## Abstract

This is a 2 years review of traumatic spine injury patients treated at GMC Jammu, a tertiary care health centre, to determine clinico-epidemiological aspects of this injury in Jammu division. The objective of this study was to study the risk factors in traumatic spinal cord injuries and to identify preventable risk factors.

## INTRODUCTION

In the Indian setup, as in most developing countries, very little is known about the exact epidemiology of spine injuries. The annual incidence of traumatic spinal cord injury (SCI) in developed countries varies from 11.5 to 53.4 per million of population (1). Deaths after admission for acute SCI range from 4.4% to 16.7 % (2). In our setup, most of these injuries occur due to fall from roofs, fall from hills and trees, or road traffic accidents, which can be prevented. An epidemiological study can provide valuable information regarding the magnitude of this problem and resultant demand on health care resources. It can help to identify the most common risk factors involved in SCI. It can also help formulate preventive measures which can modify or eliminate the risk factors and may decrease the incidence of this incapacitating injury.

## MATERIAL AND METHODS

The study was conducted from January 2006 to July 2008. We included in this study all the patients of traumatic spinal cord injuries with or without any neurological deficit referred to emergency wing of our institution from various places of Jammu division. Patients who died before reaching hospital were excluded from the study. Detailed history was taken with respect to age, sex, place of living, mode of injury, associated injury, socio-economical status, time taken to reach hospital, whether properly immobilized during referral or not, and any kind of treatment received before referral .

Study variables: Age, sex, mode of injury, SCI level, seasonal variation, and associated injury.

## RESULTS AND OBSERVATIONS

A total of four hundred three 403 cases of SCI were reported between January 1st 2006 and June 30th 2008. There were 302 males and 101 females; male to female ratio was 2.98:1 (Table1).

### Figure 1

Table 1: Sex distribution

Sex	No. of cases	%age
Male	302	74.9%
Female	101	25.1%

The most prevalent age group was 20-30 years followed by 30-40 years (Table 2).

**Figure 2**

Table 2: Age and sex distribution.

Age Group (years)	no. of Cases (n=403)					
	Males (n=302)		Females (n=101)		Total	
	no.	%	no.	%	no.	%
0-9	1	0.3	1	1	2	0.5
10-19	11	3.6	6	5.9	17	4.2
20-29	150	49.7	40	39.6	190	47.1
30-39	61	20.2	31	30.7	92	22.8
40-49	41	13.6	20	19.8	62	15.4
50-59	33	10.9	1	1	34	8.4
60-69	3	1.0	2	2	5	1.2
70	2	0.7	0		2	0.5

Most of the patients 250 (62.5%) were from the hilly areas of Jammu division like Poonch, Doda, Udhampur, Kathua and Rajouri, having no tertiary care hospital. The most common cause of injury was fall from height including roof, trees, electricity pole and Hill tops (50%, n = 201) followed by motor vehicle accidents (30.3% n = 122) (Table3).

**Figure 3**

Table 3: Mode of Injury (n=403)

Mode	No.	%
Fall from Height(roof, tree, electricity pole and hill)	201	50
Road traffic accidents	122	30.3
Assault	11	2.7
Fall of heavy weight on back	37	9.2
Cave In	28	6.9
Sports Related (Wrestling)	3	0.7
Others: Fall into well	1	0.2

Falls were more prominent in second and third decades whereas road traffic accidents were commoner in third and

fourth decade.

Hundred patients (24.8%) had cervical spine injury with various grades of neurodeficit, with most common site being fifth and sixth cervical vertebrae and 303 (75.2%) had dorsolumbar spine injury, the with first lumbar being the most commonly fractured vertebra followed by twelfth dorsal vertebra. Neurological grading was done using Frankel's Grade. Majority of the patients (77.9%, n = 314) had varying degrees of neurological deficit. (Table 4).

**Figure 4**

Table 4: Neurological Status

Frankel Grade	No. of Patients	% age
A	52	12.9
B	62	15.4
C	98	24.3
D	102	25.3
E	89	22.1

Frequency of SCI showed an increase during summers followed by rainy season. In 75 % cases no associated trauma was identified. In rest most prevalent associated injury was head injury, followed by extremity fractures, chest injury, abdominal injury and pelvic injury. Eighty percent (323) patients reported to institute directly whereas the rest were initially seen by village quacks or unqualified practitioners. Only 40 patients (9.9%) were referred after initial care by qualified doctors. Only 98 (24.3%) patients used an ambulance for transfer, whereas 305 (75.7%) patients were transported by vehicles unsuitable for a spinal patient such as bus, minibus etc without proper immobilization. The duration of hospital stay ranged between 7-50 days. Those without neurological deficit or stable injuries were discharged early and had a short stay. Nine cases died during the study period out of these, 8 cases were of cervical spine injury with complete neurological deficit.

**DISCUSSION**

The Sudden onset of SCI is dreadful and has a profound impact on the individuals and their families. Knowledge of epidemiology of SCI in a given area is important not only for adequate treatment and rehabilitation of the patients but also for better distribution of limited health care resources. Most of the studies in medical literature are from developed countries where the problem and presentations are different with respect to mode of injury, sex, and incidence. We feel

that it is unimaginable in west that a patient with spinal injury will not be shifted to a fully equipped spine centre within one hour interval. Whereas here in India it is a routine to receive majority of the patients after 2-3 days, or even weeks after spine injury Though this study may not be a true representation of all spinal injuries in the society, as it is restricted only to one institute, it can best be taken as the trend in most of the hilly states, as we receive patients from a vast area, the institute being the only Government Medical College in entire Jammu division.

The age distribution of patients is comparable with studies from the other parts of the India and World. Most commonly affected age group is 20-30 years (3, 4, 5) which is the most active and productive age group of any society. Since men are more exposed to all the risk factors, there is a higher incidence in males. Road traffic accident (RTA), fall from tree, sports injuries were commoner in males. Fall from hill tops was more seen in females, where the fall occurred while cutting the grass. Sex distribution has shown a male female ratio of 2.98:1 which is comparable to other recent studies, but reflects a changing trend when compared to studies conducted 15 to 20 years back (Table 5).

**Figure 5**

Table 5: Comparison of sex ratio in different series.

Series	M:F ratio
Chaco et al (7) (India)	13.5 : 1
Shanmugasundram (4)(India)	8.98 : 1
Shingu et al (9) (Japan)	4.3 : 1
Lan et al (8) (Taiwan)	4 : 1
Dave et al (5) (India)	3.7 : 1
David Chen (6) (India)	3.7 : 1
<b>Present Study</b>	<b>2.98: 1</b>

There has been substantial decrease in male female ratio which reflects the changing face of social norms. Agriculture is the main profession in our state and females are equally participant at work.

Mode of injury in SCI is dependent on local factors. In all Indian series fall from height rates the highest among the aetiological factors, whereas in advanced countries RTA ranks highest (Table 6).

**Figure 6**

Table 6: Mode of injury: A comparison of different series.

Series	Fall from Height (%)	RTA (%)
Chacko et al (7)	55.2	12.8
Shanmugusundram (4)	66	14
Dave et al (5)	49.4	36.5
<b>Present series</b>	<b>50</b>	<b>30.3</b>

There is a gradual trend towards increasing incidence of RTA indicating gradual urbanization of society and increase in number of vehicles on roads in India.

Dorsolumbar injury is the commonest site because of the anatomical reasons. The dorsal spine is fixed and less mobile because of rib cage as compared to lumbar spine which is very mobile portion of spine. The sudden transition from fixed to mobile portion makes dorsolumbar area as a precarious site. Seasonal distribution of SCI showed a marked increase during summer, signifying increased movement of people in this season. Head injury was the most common associated trauma, especially with cervical spine injury. A large chunk of patients were from poor socio-economic strata belonging to rural areas where, there is tremendous lack of basic infrastructure and trained medical personnel, especially in rural areas, involved in initial management of patient. Majority of people lack basic knowledge about the initial immobilization and transportation of these patients to higher centres and by the time patient reaches a hospital; there may be an extensive deterioration in neurological status, which could have been prevented.

**CONCLUSIONS**

There is a strong need to identify the risk factors in SCI and to take steps to control them by disseminating information to masses, to train paramedical staff in rural areas about initial handling and transportation of such patients. Certain preventable risk factors in traumatic SCI (falls, vehicular accidents, improper pre-hospital care and improper transportation) need to be addressed in particular in order to reduce the frequency and morbidity of SCI and the burden on meagre financial and health resources of our state. We also feel that a comprehensive protocol for the management of acute spinal injuries should be formulated by different

countries keeping in mind their own existing native topography, health resources, literacy and socioeconomic status.

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