

Retrospective study of spinal cord injury patients admitted to spinal injury rehabilitation center, Sanga, Banepa, Nepal

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ABSTRACT

Spinal cord injury is a serious problem that affects many facets of an individual's life. This was a retrospective study which included data from all patients admitted to the Spinal Injury Rehabilitation Center (SIRC), Sanga with spinal injuries over a 4 year period between January 2008 and January 2011. The overall objective of the study was to determine the epidemiology of spinal injury patients admitted at the center. Socio-demographic details, mechanism of injury, level of injury, ASIA score and length of hospital stay of the subjects were recorded and analyzed. An incremental pattern was observed in the number of spinal injury patients attending SIRC. In the year 2008, 81 patients of spinal injury were recorded which increased to 122 in 2011. A total of 381 spinal injury patients were included in the study out of which a majority, 73.50% were male, 30.45% belonged to the 21-30 years age group and 23.10% belonged to the 31-40 years age group. A majority of Spinal injury patients, 189 (49.60%), were from the Central region followed by 89 (23.36%) from the Western region. Fall from height (68.24%) was the predominant cause of spinal injury followed by road traffic accident (18.63%). In the study, 213 subjects (55.91%) had ASIA A scoring and thoracic injury (49.34%) was most common followed by lumbar injury (29.66%), cervical injury (17.84%) and sacral injury (3.15%). About Two-fifths (40.42%) of the spinal injury patients were conservatively managed whereas three-fifths (59.58%) underwent surgery and length of stay of patients ranged from 2 to 305 days. This study shows that the young adults, predominantly males in their most productive years of life, are prone to traumatic spinal cord injury which results in personal and family tragedies along with socioeconomic burden to the nation. Thus, recognizing the pattern of traumatic spinal cord injuries, relevant etiological factors and identification of high-risk groups is necessary in designing better methods of prevention.

Keywords: Spinal Injury, Rehabilitation, Retrospective study, Kathmandu, SIRC, Spinal Centre.

INTRODUCTION

Spinal cord injury (SCI), a devastating condition that bears high rates of morbidity and mortality, affects many facets of an individual's life. Often spinal cord injury patients are of the younger age group.¹ Early surgery and comprehensive rehabilitation markedly reduces the overall morbidity of spinal cord injury patients by enabling the patient to lead an independent life.^{2,3} The incidence of SCI varies widely from country to country according to cause, study methodology, and source of data.⁴

Spinal injury Rehabilitation center(SIRC) is a non-profitable charitable organization established in 2002 with an aim to rehabilitate the spinal injury so that they may become to the best of their ability physically, mentally, socially, economically independent. SIRC provides patients with physiotherapy, occupational therapy, medical nursing, social service and vocational training. It is a 51 bedded rehabilitation center registered with the Ministry of Health, Government of Nepal and situated in Bhaisepati, Sanga, Kavre.

There is no other study on the incidence and prevalence of SCI conducted in Nepal till date. The few retrospective studies performed are not comprehensive enough to draw any reliable conclusions. Thus this study contributes to the knowledge regarding the epidemiology of spinal injury patients in Nepal and can be used to plan preventive measures and management strategies for spinal injury patients.

MATERIALS AND METHODS

In this retrospective study, all the records of spinal injury patients admitted to the SIRC from 2008 to 2011 were studied. The details consisting age, sex, place of living, mode of injury, length of hospital stay, level of injury, and ASIA score were taken from the record files of patients. These parameters were entered in Microsoft Excel and analyzed.

RESULTS

Details of 381 patients of spinal injury in the 4 year period (2008-2011) were recorded. There was an obvious

incremental pattern in the number of spinal injury patient attending SIRC. In the year 2008, 81 patients of spinal injury were recorded which increased to 122 in 2011 as shown in Figure 1.

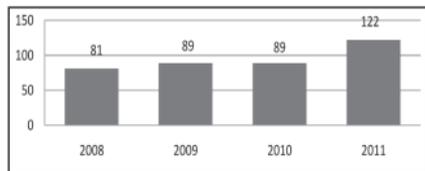


Fig.1. No. of Spinal injury patients in 4 years

A total of 381 spinal injury patients were included in the study out of which a majority, 73.50% were male as can be seen in Table 1.

Years	No. of male patients (%)	No. of female patients (%)	Total no. of patients
2008	53(65.43)	28 (34.56)	81

Table-1: Gender wise distribution of Spinal injury patients for 4 years

2009	67 (75.28)	22 (24.72)	89
2010	69 (77.53)	20 (22.47)	89
2011	91 (74.59)	31 (25.41)	122
Total	280 (73.50)	101 (26.50)	381

Among the spinal injury patients attending SIRC over the 4 year period 30.45% belonged to the 21-30 years age group and 23.10% belonged to the 31-40 years age group as shown in Table 2.

Table-2: Age wise distribution of Spinal injury patients for 4 years

Age group (years)	No. of patients				Total (%)
	2008	2009	2010	2011	
≤20	10	13	11	18	52 (13.12)
21-30	27	25	27	37	116 (30.45)
31-40	20	21	24	23	88 (23.10)
41-50	14	19	13	27	73 (19.16)
51-60	5	8	7	10	30 (7.87)
>60	5	3	7	7	22 (5.77)

In the study a significant proportion of spinal injury patients, 189 (49.60%), belonged to the Central region followed by 89 (23.36%) from the Western region, 50 (13.12%) from the Eastern region, 36 (9.45%) from the Mid-western region and 17 (4.46%) from the Far-western region as displayed in Table 3.

Table-3: Region wise distribution of Spinal injury patients

Region	No. of patients				Total (%)
	2008	2009	2010	2011	
Eastern	16	9	8	17	50 (13.12)
Central	30	57	49	53	189 (49.60)
Western	22	12	25	30	89 (23.36)
Mid western	8	8	3	17	36 (9.45)
Far western	5	3	4	5	17 (4.46)
Total	81	89	89	122	381

Among the spinal injury patients, the main cause of injury was found to be fall from height as reported in 68.24% of the cases, which included fall from ladder, tree, height or cliff. The second most common reported cause was road traffic accident in 18.63% of the cases as seen in Table 4.

Table-4: Cause of Spinal injury

Cause of Spinal injury	No. of patients (%)
Buried by mud	30 (7.87)
Fall from height	260 (68.24)
Road traffic accident	71 (18.63)
Others	20 (5.25)

Out of all the patients, 213 (55.91%) had ASIA A scoring and no scoring was available for 38 cases (9.97%) as displayed in Table 5.

Table-5: ASIA scoring of the Spinal injury patients

ASIA scoring	No. of patients				Total (%)
	2008	2009	2010	2011	
A	41	30	58	84	213 (55.91)
B	5	6	6	20	37 (9.71)
C	10	17	7	7	41 (10.76)
D	10	3	11	11	35 (9.19)
E	6	4	7	0	17 (4.46)
NA	9	29	0	0	38 (9.97)

In the study, thoracic injury (49.34%) was most common followed by lumbar injury (29.66%), cervical injury (17.84%) and sacral injury (3.15%) which can be seen in Figure 2.

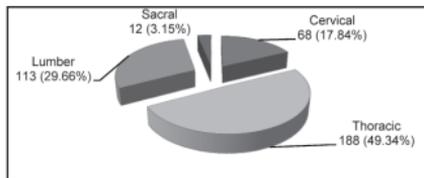


Fig.2. Level of Spinal cord injury

In the study, 154 (40.42%) of spinal injury patients had conservative treatment whereas 227 (59.58%) had surgery and length of stay varied from a minimum of 2 days to a maximum of 305 days.

DISCUSSION

The study recorded the details of 381 spinal injury patients who were admitted in SIRC from 2008 to 2011 and males were found to be 2.77 times more prone to spinal cord injury than females which is similar to findings in other studies.⁵⁻⁸ This may be because males are more likely to be engaged in outdoor work and hence are more prone to spinal cord and/or other trauma which causes a serious economic burden to the community. The other reason may be the male dominated society in Nepal which may not consider the need for treatment and rehabilitation of spinally injured women.

Our study also reflects that the adult population belonging to the age group 21-30 years followed by 31-40 years were the most susceptible to spinal injuries which is similar to a study conducted in South Africa by Hart and Williams⁷ and in Novosibirsk, Russia by Silberstein and Rabinovich.⁹ Adult people are the active age group of any community, which makes them more susceptible to spinal cord injuries.

The spinal injury patients in SIRC were mainly from the Central region followed by Western region, Eastern region, Mid western region and Far western region of Nepal. This may be due to the location of SIRC in the Central region and patients of this region could easily come to this center for rehabilitation.

In the study the most common cause for spinal injuries was fall from height followed by road traffic accidents which was similar to the study conducted by Pandey *et al* in India,⁶ by Silberstein and Rabinovich in Novosibirsk,

Russia,⁹ by Pickett *et al* in Canada¹⁰ and by Masood *et al* in Karachi.¹¹ This might be because of the geographic pattern of our region and the need to climb trees for fodder. Some falls could have been prevented as houses in rural and urban areas of Nepal lack essential safety precautions like fencing of the terrace and guarding of the staircase. Moreover, the habit of working on an unprotected terrace can lead to fall from the terrace while working. Use of mud in the construction of rural houses also endangers the lives of the people living in them. Velmahoset *et al* also concluded that spinal injury is frequent among survivors of falls from a height greater than 10 feet.¹²

Solagberuini Nigeria¹³ and Otom *et al* in Jordan¹⁴ reported that road traffic accidents were the most common cause for spinal cord injury which differs from our findings. Lack of strict implementation of traffic rules and lack of awareness of traffic rules among the general population is also an important cause of road traffic accident and spinal trauma.⁶

Out of all the patients, more than half of patients had ASIA A scoring of the spinal cord injury. Bajracharya *et al* in Eastern Nepal⁵ also found 34% had Frankel grade A followed by E. In our study, thoracic injury was most common followed by lumbar injury whereas Bajracharya *et al* and Masood *et al* observed cervical injury followed by thoracic injury.^{5,11} Out of the total spinal injury patients in the study, 3/5th underwent surgery and 2/5th were conservatively managed. The length of stay of patients in SIRC ranged from a minimum of 2 days to a maximum of 305 days.

Although this is a retrospective study, it should certainly prove to be an important document which sheds light on the epidemiological characteristics of spinal injury patients in Nepal. We recommend building barricaded walls or fences in the houses; not to climb trees to collect fodder and if climbing heights is necessary then precautionary measures should be taken. There is no easy solution for spinal injury patients but we can provide essential rehabilitation and awareness to their family members so that they get support from their families. Our focus should be on the community outside the hospital for their easy survival etc.

There is a trend of increasing incidence of spinal injuries among physically active and predominantly male members belonging to the productive age group of 21-40 years. More than half of the patients had ASIA A scoring highlighting the need to take steps to prevent spinal cord injury and establish specialized spinal trauma units to avoid loss of young active manpower.

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