Spinal Cord (2011) 49, 783–786

www.nature.com/sc

ORIGINAL ARTICLE

Characterization of spinal cord lesion in patients attending a specialized rehabilitation center in Bangladesh

MS Islam[1], MA Hafez[2] and M Akter[3]

[1]*Department of Physiotherapy, Bangladesh Health Professions Institute, CRP—Chapain, Savar, Dhaka, Bangladesh;* [2]*Department of Epidemiology and Biostatistics, Bangladesh Institute of Health Sciences, Mirpur, Dhaka, Bangladesh and* [3]*Rehabilitation Department, Shishu Polli Plus, Sreepur, Gazipur, Bangladesh*

Study design: This study was designed as a cross-sectional study.
Objectives: The objective of this study was to find out the clinical types and sociodemographic characteristics of patients with spinal cord lesion (SCL).
Setting: Centre for the Rehabilitation of the Paralysed (CRP).
Methods: Data were collected by face-to-face interview, with a structured interview schedule from admitted patients. Descriptive measures and χ^2-test were applied for data analysis.
Results: Of 107 patients, majority (20%) belonged to age group of 25–29 years (mean 31 ± 12.2 years). About 83% were males; 65% married and 54% illiterate. Agricultural and other day laborers constituted the major occupation groups with mean monthly family income of US $60 (± $53). About 92% came from rural area and 84% belonged to nuclear family. About one-third of the patients were referred by the medical college hospitals. About 65% of the patients were admitted at 1–29 days of lesion with longest duration of 3 years. Patients were mostly (93%) traumatic. Fifty-four percent had paraplegia and most common skeletal level segment was cervical (44%). About 43% had pressure sores at admission. Eighty-nine percent needed management for bladder function through the use of catheter. Age, sex and occupation were associated with type of paralysis, skeletal level of injury and neurological condition; physical status, causes of lesion, type of injury and skeletal level of injury; and skeletal level of injury, respectively, ($P<0.05$).
Conclusion: Major cause of SCL was traumatic. Available treatment facilities were inadequate and needed improvement through government and private initiatives.
Spinal Cord (2011) **49,** 783–786; doi:10.1038/sc.2011.36; published online 19 April 2011

Keywords: SCL; traumatic; non-traumatic; paraplegia; tetraplegia; ASIA

Introduction

Spinal cord lesion (SCL) is sudden and unexpected. It can be devastating and costly in human and social terms.[1] Owing to inadequate services, most people with SCL in low-resource countries died within 2 years of acquiring spinal injury.[2] SCL continues to be a major cause of disability throughout Asia[3] as well as in Bangladesh.[4] Patients who have SCL, very often develop life-threatening complications.[3] These patients can, however, be assisted to regain integration within the community by appropriate treatment and specialized rehabilitation.[2] In Bangladesh, there is no specialized government hospital for the treatment and rehabilitation of people with SCL. The only one non-government organization is the Centre for the Rehabilitation of the Paralysed, which has been working in this field for the last 30 years. This could, therefore, be seen as an area not receiving due attention by the government, leaving the treatment and rehabilitation of these patients mainly to non-government organizations.

Advances in acute care, intensive care and long-term management have improved the survival rate and life expectancy in these patients, even in developing countries. This study will contribute to further enhancing our knowledge about the type, nature and extent of SCL in Bangladesh, and would thus help develop effective policies and programs in this field.

Materials and methods

The study was conducted on patients admitted at the CRP, a 100-bed hospital situated in Savar, about 25 km away from the capital city, Dhaka. The study was conducted from January to June 2009. Readmitted patients with SCL and patients other than SCL were excluded. During this period, a total of 115 patients were available in the hospital, of which

Correspondence: MS Islam, Department of Physiotherapy, BHPI, CRP-Chapain, Savar, Dhaka-1343, Bangladesh.
E-mail: physio.shofiqul@gmail.com
Received 9 August 2010; revised 31 January 2011; accepted 15 March 2011; published online 19 April 2011

107 fulfilled the inclusion criterion. Therefore, sample size was 107.

Data collection methods and tools
Data were collected using an interview schedule containing (1) sociodemographic characteristics provided by the patients or their attendants and (2) information related to the SCL and treatment collected from records and the careprovider, such as doctor, matron, physiotherapist, occupational therapist and so on. Informed verbal consent of the patients was obtained before data collection. The International Classification of External Causes of Injury (ICECI) guidelines were followed in developing the interview schedule.

Results

Patients' sociodemographic characteristics
Out of 107 patients, 70% ($n=74$) were below the age of 40 years. The distribution pattern by 5-yearly age group, up to 40 years, did not show much variation, except at age 25–29 years, which showed maximum number of 23 patients (21.5%). The actual age range was between 9 and 60 years (median = 30 years) and mean age was 31(±12) years. More than 80% ($n=89$) were males. The mean monthly family income of the patients was US $ 60 (±$53). More than half of the patients came from adjoining districts of Dhaka. The remaining belonged to the rest of the country. Table 1 also provides information on marital status, education, occupation, family and residence.

Table 1 Sociodemographic characteristics of patients

	Patients (n)	*Percentage (%)*
Age (in years)		
<40	74	69.2
⩾40	33	30.8
Sex		
Male	89	83.2
Female	18	16.8
Marital status		
Married	70	65.4
Unmarried	35	32.7
Widowed	2	1.9
Educational status		
Illiterate	58	54.2
Primary	24	22.4
Secondary	20	18.7
Higher secondary or above	5	4.7
Occupation		
Agricultural and other laborers	54	50.5
Small job	22	20.5
Housewife	11	10.3
Student	10	9.3
Petty business	10	9.3
Family type		
Nuclear	90	84.1
Extended	17	15.9
Residence		
Urban	9	8.4
Rural	98	91.6

Information related to SCL and treatment
Treatment-seeking pattern. Only nine patients (8.4%) sought treatment on the same day of injury; 63% within 1 month and the rest 29% after 1 month, which extended up to 3 years. Only six patients sought treatment directly. Out of the rest, 89 (83%) got admitted on referral from primary-, secondary-, and tertiary-level government hospitals and private hospitals/clinics. Of these 89, 46 (52%) belonged to tertiary-level government hospital, including the only specialized government hospital, National Institute of Traumatology and Orthopaedic Rehabilitation, Dhaka.

Characteristics of SCL. About 44% patients had cervical lesion, 27% had thoracic and 29% had lumbar injury. Of the cervical, C-6, C-5 and C-10 had quite close frequency distribution ranging between 9 and 15%. Among the thoracic, T-12 with 13% had the majority and among lumbar, L-1 had the majority incidence (Figure 1). Neurological conditions according to the American Spinal Injury Association (ASIA) scale showed about 78% of the patients falling in the complete A group (Figure 2).

About 93% of the patients were traumatic. Of the traumatic causes, fall from height had the highest frequency, followed by fall while carrying heavy load on head, fall of

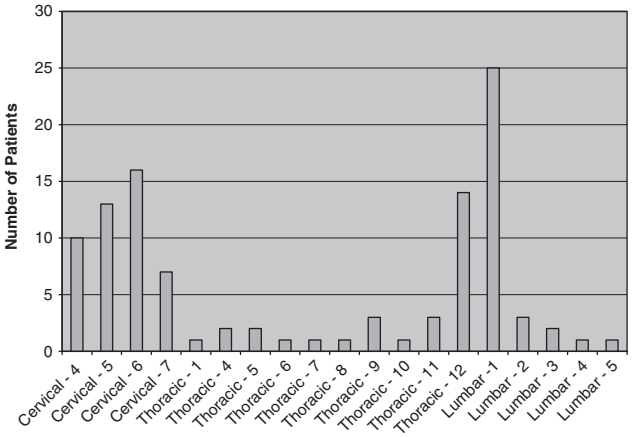

Figure 1 Skeletal level of injury at admission.

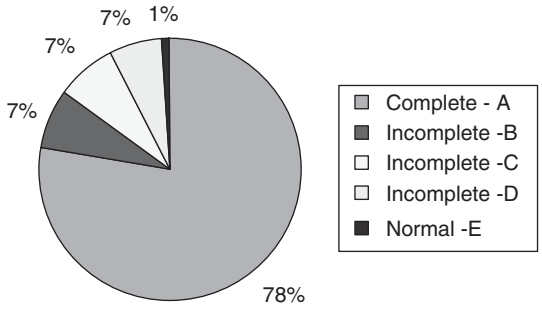

Figure 2 Neurological condition according to the American Spinal Injury Association scale at admission.

Table 2 Disease and treatment-related information

	Patients (n)	*Percentage (%)*
Causes of lesion		
Traumatic	99	92.5
Non-traumatic	8	7.5
Causes of traumatic lesion		
Fall from height	50	50.5
Fall while carrying heavy load on head	15	15.2
Fall of heavy object on neck	5	5.1
Fall of heavy object on back	12	12.1
Road traffic accident (RTA)	11	11.1
Others	6	6.0
Causes of non-traumatic lesion		
TB spine	5	62.5
Transverse myelitis	3	37.5
Type of paralysis		
Tetraplegia	49	45.8
Paraplegia	58	54.2
Physical status		
Paralyzed lower limbs	52	48.6
Paralyzed four limbs	47	43.9
Weakness in lower limbs	6	5.6
Weakness in all four limbs	2	1.9
Pressure sore on admission at CRP		
Present	46	43.0
Absent	61	57.0
Bladder function management		
Normal bladder function	12	11.2
Management needed (catheter)	95	88.8

Abbreviation: CRP, Centre for the Rehabilitation of the Paralysed.

heavy object on neck and back and road traffic accident. Causes of non-traumatic lesion consisted of tuberculosis of spine and transverse myelitis. Tetraplegia and paraplegia were almost equal with 46 and 54%, respectively. About 44% patients had all four limbs paralyzed, 43% had pressure sore and about 90% needed bladder function management through use of catheter (Table 2).

Association of selected characteristics of SCL with age, sex and occupation

Physical status, causes of lesion, type of paralysis, skeletal level of injury and neurological condition according to the ASIA scale were examined for association with age, sex and occupation. Association was found among (1) types of paralysis ($P=0.004$), (2) skeletal level of injury ($P=0.011$) and (3) neurological condition according to the ASIA scale ($P=0.038$), with age <40 and $\geqslant 40$ years. Sex was found to have an association with (1) physical status ($P=0.0001$), (2) causes of lesion ($P=0.0001$), (3) types of paralysis ($P=0.001$) and (4) skeletal level of injury ($P=0.006$). Occupation was associated with skeletal level of injury ($P=0.018$).

Discussion

Most of the patients had no or low education, doing menial jobs or petty business and earning poor income. They were mostly villagers. In India, among SCL patients, 60–70% were illiterate, poor and living in villages.[5] Surprisingly, but not unexpected, though is the fact that they mostly belonged to nuclear families (90 (84%)), pointing to the demographic transition in action even at the grassroot level. Compared with females, the number of males was predominantly high with a sex ratio (M/F) of 5:1. An earlier study in Bangladesh[4] quoted the sex ratio of 7.5:1. Male predominance was observed in studies conducted in India, Pakistan, Japan, Sweden, Ireland, Finland, the Netherlands, Jordan, Taiwan, Israel, Turkey, UK and Canada.[6–18] This is not unexpected, as males are exposed to higher risks because of their occupation or type of work they do. Women all over the globe are less exposed to the type of work that carry risk of this particular type of injury, for example, fall from tree, fall from high place, that is, high-rise building, or falling while having load on neck or back. These types of risky and challenging jobs are naturally the jobs of the comparatively younger people, which are reflected in our study; also, as about 70% of our patients were below the age of 40 years. Further detailed examination shows about 30% were below the age of 25 years. The age pattern of our study was similar to that of the earlier study of Bangladesh as well as those conducted in countries stated above.[5,7,11,15,16] Seventy percent of the patients were married.

About 78% of the patients' neurological status as per the ASIA scale was complete A (completely paralyzed). Our study finding is quite similar to that of Israel where corresponding figure was quoted as 61%.[15] Forty-three percent of our patients had pressure sores, an indicator of patients' ignorance and negligence about management of SCL. The proportion of pressure sores found among Americans was reported as 46%, which is slightly higher than our study.[19] In Bangladesh, causes of SCL are most likely to be influenced by their socioeconomic condition. Most people of Bangladesh are poor. They live in unhygienic environment, experience malnutrition and start work at an early age. These probably increase the likelihood of disease-related problem such as tuberculosis in the spine and fall from heights. Irrespective of age or sex, these patients' personal life was miserable. Unlike developed countries, where these type of patients enjoy social security, in less developed countries like Bangladesh or elsewhere in Asia, even globally, these patients are liabilities for their respective families. Under the given social background, when the families have to fight hard for their subsistence, even with healthy members, having a family member with SCL of complete A in the ASIA scale is a burden beyond their financial capacity to bear. Hence, for the family they were an economic burden and a constant cause of concern. The remaining 22% also cannot engage themselves in any gainful employment, which might lead to depression and related complications. As days pass, families might start neglecting them, ultimately pushing them to begging—a social nuisance. The married patients (65%) of nuclear families are usually the only earning members, who were losing income on the one hand and incurring cost (in terms of treatment and subsistence) on the other, result in endless misery. Maybe in some case, the entire family is subjected to begging—a social burden. Another dimension of the

problem is that of marriage for the unmarried ones (33%), particularly for the females. Hence, the overall social and human picture is extremely miserable.

The high proportion of referral 52% from tertiary-level hospitals and the specialized hospital, run by the government shows inadequacy of facilities and lack of availability of skilled manpower to cope with this problem. On the other hand, in the future, the volume of patients may be too large for CRP to handle, as the number of patients from outer districts visiting it is certainly going to increase.

Conclusion

High proportion of SCL in Bangladesh was due to traumatic causes, which were preventable. SCL, a disability-oriented injury seems to occur mostly in young males of low social status, in terms of education, occupation and income in their productive years, demolishing their physical and earning capability leading to grievous problem at individual, family and social level. There has been little effort to prevent and provide appropriate rehabilitation services. The CRP is the only organization in Bangladesh to provide specialized services for people with SCL. In future, it will be too difficult for CRP to handle the volume of the patients. Moreover, there is lack of proper early management after spinal cord injury, which has significant impact on neurological status of the injured with SCL. This necessitates the need for prompt initiative by the government and service providers to focus on prevention and early management of SCL in Bangladesh to ensure better quality of life for patients with SCL in Bangladesh. To overcome this acute problem, pragmatic policy and program needs to be launched. A country-wide prevalence study is recommended to estimate the magnitude of the problem.

Conflict of interest

The authors declare no conflict of interest.

Acknowledgements

We thank Professor Liaquat Ali, Director BIHS and the dissertation committee of BIHS for allowing us to conduct the research. We are thankful to CRP authorities and the patients for their cooperation. We thank Lisa Harvey, Associate Professor, the University of Sydney for her valuable suggestions.

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