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Epidemiology of Spinal Cord Injury in Bangladesh: A Five Year Observation from a Rehabilitation Center

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Abstract

Background: Spinal Cord injury, whether traumatic or non-traumatic, is a devastating and debilitating neurological condition and the incidence of spinal cord injury is increasing with time. It was aimed to look into the epidemiology of spinal cord injury in Bangladesh as a preliminary step towards the prevention of this condition and the related complications.

Methods: Records of all admitted patients with spinal injuries from January 2011 to June 2016 were collected from the medical records of the Center for Rehabilitation of the Paralysed (CRP) hospital. Records were found of total 2184 respondents and data were analyzed by Statistical Package of Social Science (SPSS) 16 version and Microsoft Excel Software 2007 version.

Results: Among 2184 respondents 86.8% (n=1897) were male; most of the patients were in their 3rd decade which consisted 25.7%, 1513 (69.2%) of the respondent were from rural area. About 52% (n=1136) had the diagnosis of traumatic paraplegia and 42.6% (n=932) had traumatic tetraplegia. 992 of the participants (45.4%) had fall from height and Road traffic accident was the second common cause having the distribution of 567 patients (25.9%). Regarding the extent of injury, 59.8% (n=1292) participants had complete injury that is category A in ASIA scale.

Conclusion: Despite being a single center based study, this extensive epidemiological data can direct as a base line and further large scale study would better to generalize the result.

Keywords: Spinal cord injury; Epidemiology; CRP; Bangladesh

Introduction

Spinal Cord injury, whether traumatic or non-traumatic, is a sudden [1], devastating and debilitating [2-4] neurological condition [5] addressed throughout the history [5,6]. The incidence of spinal cord injury is increasing with time with an annual rate of 15-40 cases per million [2,5,7] with male predominance and a propensity of affecting the low-socio economic group [2]. The condition leads not only to varying degrees of physical disabilities including paralysis, sensory deficit, dysfunction of bowel and bladder [3,4,8,9] but also to various crippling complications such as pressure sore, autonomic dysreflexia, deep vein thrombosis, spasticity, sexual dysfunction and pneumonia [2,4,8]. On top of that, spinal cord injury poses grave impact over the economy both personal and national, as the condition itself as well as the complications lead to significant increase of cost [2,10]. Moreover, the psychological effects of spinal cord injury create burden for the patient as well as family members and also for the society [8].

Generally, trauma of various method is acknowledged to be the principle cause of spinal cord injury. Fall from height, road traffic accident, gunshot injury, sports injury is so far identified to the leading cause of injury around the world [2,4,5,10] and spinal tumor, tuberculosis(TB), transverse myelitis(TM) seems to the principle non-traumatic cause [2,5,6,9]. American Spinal Injury Association (ASIA) impairment score has been used for measuring the extent of injury and level of impairment varies from paraplegia to tetraplegia [10-12]. Regardless of the cause and extent spinal cord injury is considered to be a condition where the chance of curative treatment is very few [3,5,9] and the consequences which follow the primary event whether physical or psychological, very often lead to permanent disability as well as rate of mortality. Epidemiology of spinal cord injury varies from that of developed to developing country and so different and extensive studies are necessary in different country [3].

Bangladesh, a poor but developing country of south-asia [13] suffers a great deal of socio-economic problem arising from spinal cord injury and its health-related complications as evident from the yearly rate of admission at the specialized center like Centre for Rehabilitation of the Paralyzed (CRP) [2,14-16]. There is scarcity of extensive epidemiological data in Bangladesh hence this research aimed to assess the epidemiology of spinal cord injury as a preliminary step towards the prevention of this condition and the related complications.

Methods

Ethical considerations

The researchers were duly concern regarding the ethical aspects of the study and formal permission was taken from the Ethical Review Committee (ERC) of the Center for Rehabilitation of the Paralysed (CRP), Savar, Dhaka, Bangladesh, for conducting this study. All information was kept in secure. Confidentiality of the person and the information was maintained and observed and unauthorized persons did not have any access to the collected data.

Data collection

Records of all admitted patients with spinal injuries from January 2011 to June 2016 were collected from the medical records of the CRP hospital. Data that were recorded consisted of age, gender,

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cause of injury, neurological level of injury, methods of management, Neurological status at during and discharge from hospital. Neurological level and extent of injury were defined using the international standards set forth by the American Spinal Injury Association (ASIA). Recovery was categorized as complete, incomplete. Etiology of injury was categorized into different groups like Road Traffic Accident (RTA), Fall from Height (FFH), Heavy object fall over head/back, Shallow diving water, Hanging, Bull Attack, Stab injury, Scarf injury, Bullet injury, Physical Assault are the leading cause. Non-traumatic causes like TB spine, Transverse myelitis, Potts disease, Guillain-Barre Syndrome (GBS), Cervical Myelopathy, Congenital birth defect are leading to spinal cord injuries.

Demographic Variable	Frequency	Percentage
Age range		
<10 y	18	0.80
10-20 y	284	13
20-29 y	561	25.70
30-39 y	525	24
40-49 y	410	18.80
50-59 y	250	11.40
60-69 y	107	4.90
70-79 y	26	1.20
>80 y	3	0.10
Sex		
Male	1897	86.82
Female	287	13.14
Marital Status		
Married	931	42.16
Unmarried	165	7.56
Others	1089	49.84
Habitat		
Urban	581	26.59
Rural	1513	69.24

Table 1: Distribution of demographic variables of the respondents (n=2184).

Diagnosis	Frequency	Percent
Traumatic Paraplegia	1136	51.99
Traumatic Tetraplegia	932	42.65
Non-Traumatic Paraplegia	90	4.12
Non-Traumatic Tetraplegia	25	1.14
Head Injury	1	0.05
Total	2184	100

Table 2: Distribution of diagnoses of spinal cord injury among the respondents (n=2184).

Cause of Injury	Frequency	Percent
Fall from Height	992	45.4
Fall of object	390	17.8
RTA	567	25.9
Bull Attack	40	1.8
Other Traumatic	82	3.8
Non Traumatic	114	5.2
Total	2184	100

Table 3: Distribution of cause of spinal cord injury among the respondents (n=2184).

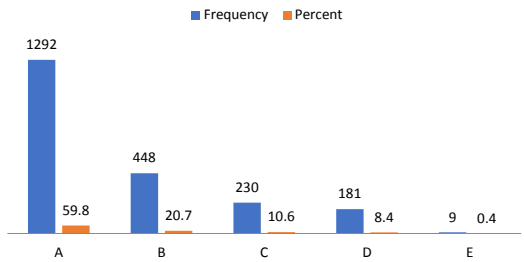

Figure 1: Distribution of ASIA Score during admission of the respondents (n=2184).

Setting and participants

CRP is known as mother organization in Bangladesh for Rehabilitation of the Spinal cord injury patients. CRP one of the largest acute spinal cord injury units in the world it provides acute care and rehabilitation. The CRP admits approximately 390 patients a year with recent spinal cord injury [15,16]. CRP receives referrals from different hospitals and from all over Bangladesh. In CRP patients pay very small amount as their income source ability but care is primarily funded by the government and not-for-profit organizations. In the above-mentioned duration, we had data of 2184 patients.

Analysis

After managing data properly, it was analyzed in SPSS (Statistical Package of Social Science) 16 version and Microsoft Excel Software 2007 version.

Results

Among 2184 respondents 86.8% (n=1897) were male and 13.1% (n=287) were female. Most of the patients were in their 3rd decade which consisted 25.7%, followed by 24% in between 30-39 years and 18.8% in between 40-49. 1513 of the respondent (69.2%) were from rural area and 581 were from urban area (26.6%) and 931 of the population married and 165 were unmarried (Table 1).

Out of 2184 respondents, 51.9% (n=1136) had the diagnosis of traumatic paraplegia and 42.6% (n=932) had traumatic tetraplegia whereas Non-traumatic paraplegia, Non-traumatic tetraplegia was the other diagnosis having the distribution of 4.12% and 1.14% respectively (Table 2).

992 of the participants (45.4%) had fall from height and Road traffic accident was the second common cause having the distribution of 567 patients (25.9%). 390 (17.8%) gave history of fall of object over head or back. Bull attack was another interestingly cause of spinal cord injury in 40 patients (Table 3).

Regarding the extent of injury, 59.8% (n=1292) participants had complete injury that is category A in ASIA scale. Category B, C and D had the distribution of 20.7%, 10.6% and 8.4% respectively (Figure 1).

Discussion

Patients admitted with spinal injuries at CRP from January 2011 to June 2016 were selected as the study population and gender, age, place of habitat and marital status were taking into consideration as demographic variables. Male predominance previously reported in both local [2,3,5,14] and global [1,3,4,8,9,10] studies were also found in this research where 86.8% (n=1897) were male and 13.1% (n=287) were female. Distribution of age in this study showed more people in their 2nd decade and 3rd decade was vulnerable to spinal cord injury which was different from Hossain et al. where the mean age was 47.44 [17] and Ulrich et al. who found the mean age to be 36.1 [18].

Propensity of rural people of suffering more from spinal cord

injury was evident from the fact that 69.2% of the respondent were from villages and it was also supported by Rahman ZM [19]. Majority of the participants of this study had traumatic paraplegia (51.9%) and the principle cause was fall from height (45.4%) and road traffic accident (25.9%) which was found to be consistent with other global literatures [3-5,8,9]. 40 patients reported Bull attack to be the cause of spinal cord injury in this research which is a fairly new and interesting phenomenon which was not previously reported.

High number of people with complete spinal cord injury evident by category A in ASIA scale was noted as 59.8% respondents were in this group and this trend was found common with Sridharan et al., Hoque et al. and Islam et al. [4,19,20].

Conclusion

Despite being a single center based study, such extensive epidemiological data was not previously reported in Bangladesh. Spinal cord injury mostly traumatic commonly due to fall from height and road traffic accident, affecting rural male in their early age and presenting with complete injury of spinal cord is the most likely picture found in this study. Further exploration in this regard to compare or to supplement with this research would help in the way of preventing this debilitating condition and its consequences.

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Conflict of Interest

Having no conflict of interest.

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