Life Expectancy of Persons with Spinal Cord Injury (SCI) Treated in a Rehabilitation Centre at Dhaka, Bangladesh

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ABSTRACT

Purpose: *To find out the average survival rate following Spinal Cord Injury (SCI) in Bangladesh.*

Method: *158 randomly selected death records of persons with SCI from the years 1979 to 1999, were analysed retrospectively in August 2009, at the Centre for the Rehabilitation of the Paralysed, (CRP), Savar, Dhaka, Bangladesh. The records showed that 91% were males and the mean age of sustaining injury was 33.85 years. Most of them were paraplegic (79.75%) and the injuries were traumatic in origin (86.1%). Overall, 56.4% of those admitted died within 5 years and only 16.4% survived beyond 10 years following SCI. Every four out of five affected persons died at home.*

Results: *Though there was difficulty in comparing survival rates of persons with SCI in developing and developed countries, life expectancy among persons with SCI in the current study was found to be much lower than that of similar patients in developed countries.*

Conclusions: *Further research on a larger scale, using an international standardised method to compare results, is essential to produce more accurate data. Special attention needs to be paid to improving the support systems for persons with SCI in the acute rehabilitation and reintegration phases of care in Bangladesh.*

Key words: *Paraplegia, life expectancy, survival, SCI, developing countries, Bangladesh.*

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INTRODUCTION

Spinal Cord Injury (SCI) has a devastating impact on quality of life as it contributes to a high level of long-term disability, morbidity and mortality, and imposes an economic burden on communities. It is one of the major causes of locomotor disabilities, both in developing and developed countries. The two predominant summary measures of survival prospects are the median survival time (the time until 50% of the population has died) and life expectancy (the average survival time of a closed group). Life expectancy is an important indicator both for clinicians and SCI survivors to assess and compare treatment achievements (Bush et al,1999; Sekhon & Fehlings, 2001; Wyndaele &Wyndaele, 2006; Couris et al, 2010) .There is general agreement in literature that life expectancy among persons with SCI has remained below normal, even with optimum medical management in earlier years. Previously, survival following a severe SCI was relatively rare because of untreatable pyelonephritis (De Vivo et al,1989). Mortality was reported to be as high as 60% ± 80%, decreasing to 30% in the 1960s, 15% in the 1970s and down to 6% in the 1980s (Ducker,1990).

However, since World War II the mortality rate in the developed countries has decreased dramatically. This decrease in the mortality rate can be primarily ascribed to the development of SCI treatment units, including well-trained, specialised teams for rehabilitation, and regular follow-up. In addition, the incorporation of updated emergency medical services and the development and proper use of antibiotics etc, in the treatment of persons with SCI, have contributed to improved survival rate (Hartkopp et al,1997) in developed countries.

Literature shows that in developing countries, lack of prevention programmes, and disorganised and inappropriate facilities and protocols for management of SCI are responsible for the very high morbidity and mortality rates, in contrast to developed countries where these rates have considerably and gradually decreased during the past five decades (De Vivo et al,1989;Ducker,1990;De Vivo et al,1993;Hartkopp et al, 1997). According to Wyndaele (2010), *'life expectancy of the injured today almost the same as in the able-bodied population, if the SCI patient is correctly treated'.*

This study aimed to find out the average survival rate following Spinal Cord Injury (SCI) in Bangladesh.

METHOD

This was a retrospective study conducted in August 2009, at the Centre for the Rehabilitation of the Paralysed (CRP), Savar, Dhaka, Bangladesh, of persons admitted between 1979 and 1999. The sample included 158 randomly selected death records of persons with spinal cord injury, treated at CRP during the study period. Information was collected from the individual record files of the admitted persons and from the death records at CRP that were maintained based on regular follow-up. The survival rate was calculated from the date of injury. Data were analysed using SPSS Version 15.

RESULTS

Of the study population of 158 persons, 91% were males. The mean age of sustaining SCI was 33.85 years, with a range of 12 to 75 years. The most vulnerable age groups were 20-40 years, covering 55.6% of persons. Frequency of SCI was less in those below 20 and above 50 years of age. In the 158 persons, 86.1% had injuries of traumatic and 13.9% of non-traumatic origin, leading to 79.75% with paraplegia and only 20.25% with tetraplegia (Table 1).

Table 1: Demographic information of SCI population under study (N= 158).

Variables	Traumatic (n=136) N (%)	Non-Traumatic (n= 22) N (%)	Total N=158
Age:			
10 - 20 years	13 (68.4)	6 (31.6)	19 (12.0)
20 - 30 years	47 (94.0)	3 (6.0)	50 (31.6)
30 - 40 years	33 (87.0)	5 (13.0)	38 (24.0)
40 - 50 years	22 (88.0)	3 (12.0)	25 (15.8)
50 - 75 years	21 (81.0)	5 (19.0)	26 (16.6)
Gender:			
Male	130 (90.3)	14 (9.7)	144 ((91.14
Female	6 (43.0)	8 (57.0)	14 (8.86)
Type of Disability:			
Tetraplegia	30 (94.0)	2 (6.0)	32 (20.25)
Paraplegia	106 (84.0)	20(16.0)	126 (79.75)

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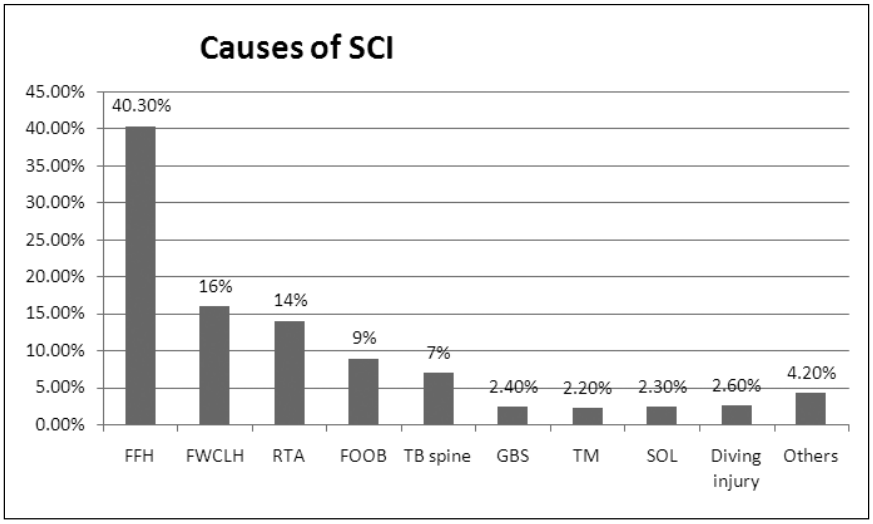
Causes of SCI

Falling from a height was the most common cause of SCI, accounting for 40.30%. Falling while carrying a heavy load on the head was second most common cause (16.0%). Among the non-traumatic cases of SCI, spinal tuberculosis was found to be the most common cause, comprising 7.0% (Fig. 1).

Figure 1: Causes of spinal cord injury (N= 158)

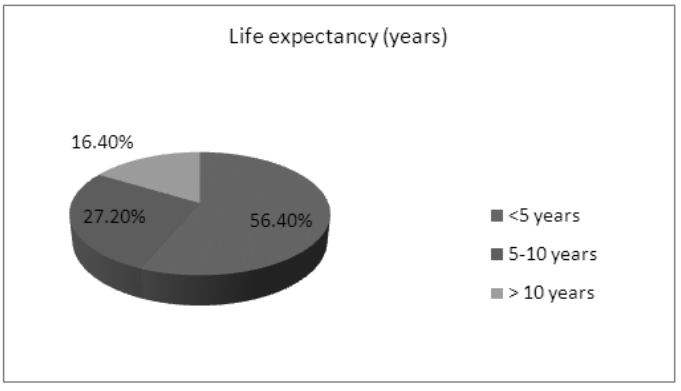


NB: FFH-Fall from height, FWCLH-Fall while carrying heavy load on head, RTA-Road traffic accident, FOOB-Fall of object on back, GBS-Guillain-Barre Syndrome, TM-Transverse Myelitis, SOL-Space occupying lesion.

Life expectancy

Life expectancy was calculated as an average number of years which a member of a closed group will live. The mean life expectancy was found to be 5.36 years. Overall, 56.4% of persons admitted with SCI died within 5 years and 43.6 % survived 5 years or more after injury (Figure 2).

Figure 2: Life expectancy in groups



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Of the 80.8% who died at home, one- third had pressure sores at the time of death.

When comparisons were drawn between mortality rates for the general population and for persons with SCI under study in different age groups, it was found that life expectancy of the general population was 10 - 12 times greater than for the SCI population, at 15, 20 and 25 years of age (Figure 3).

Figure 3: Comparison of life expectancy in persons with SCIs and general population at specific ages (years)

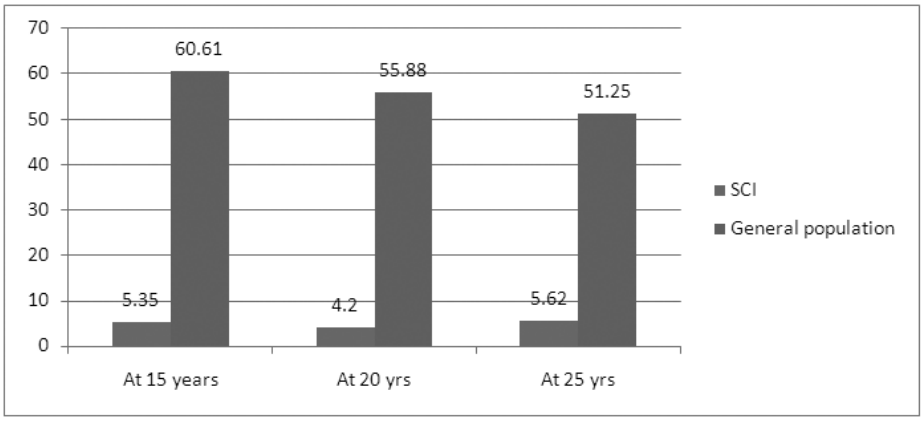


Table 2: 10 year survival of spinal cord injury by country and Author(s) of published data in developed countries.

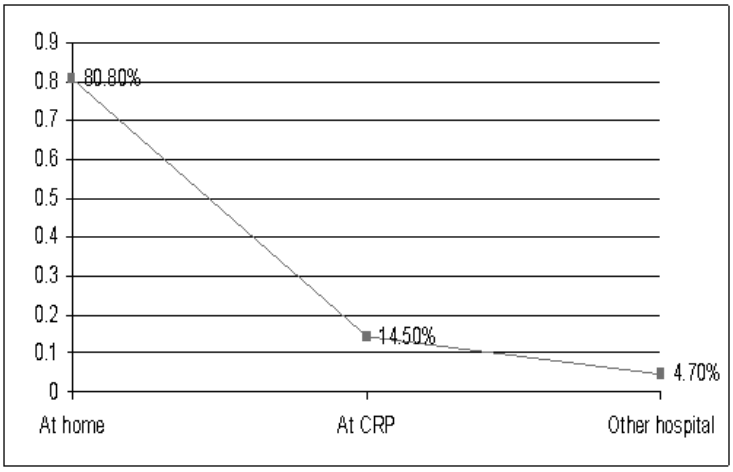
Country	Author(s)	Study period	10 year survival
Finland	Ahoniemi E et al (2011)	1976-2006	97.9% (n=414)
Australia	O' Connor PJ (2005)	1986-1997	86% (n=2892)
Canada	Mc Coll et al(1997)	1945-1991	92% (n=142)
Denmark	Harktop et al (1997)	1953-1992	Male-78.7% (n=236)
			Female 72.1%
UK	Whiteneck et al (1992)	1943-1990	85% (n=362)
USA	DeVivo MJ et al (1987)	1973-1981	80.7% (n=459)
USA	Karus JF et al (1979)	1971-1977	84% (n=320)

Survival experience was similar in most of developed countries where the studies were carried out (Table 2), possibly due to similarities of medical and surgical levels, and advances in the care of persons with SCI, starting from the injury site to pre-hospital care, acute management, and rehabilitation and reintegration.

Place of death

Every four out of five persons (80.8%) under study had died at home (Figure 4).

Figure 4: Place of death



DISCUSSION

This study revealed that SCI affects a significantly higher number of men than women. This finding is similar to those of other studies (Guttmann,1947; De Vivo et al,1980; Daverat et al,1989; Frankel et al, 1998; Strauss et al, 2006; Zubia et al, 2008). This difference between men and women with respect to incurred SCI, is due to the fact that men tend to be exposed to work or activities that make them vulnerable to SCI, while women generally do not go out to work and remain indoors.

The mean age at injury (33.85 years) showed similarity with other studies regarding SCI (Strauss et al, 2006; O'Connor, 2005; Gregory et al, 1993; Catz et al, 2002). Men in their most active and productive period of life (20-40 years) were the ones affected by SCI. The high number of younger SCI victims results in serious economic loss to the family, as well as to the community and country.

It was found that the majority of persons were paraplegic rather than tetraplegic (79.75% vs 20.25%), which is different from findings in other studies. In France, 52% were found to be tetraplegic, and 48% paraplegic (Daverat et al, 1989); a study in Pakistan showed that 47.2% were tetraplegic and 52.8% paraplegic (Zubia et al, 2008). This difference in finding may be due to the higher mortality of persons with cervical cord injury as a result of different causes of injury in other countries, improper evacuation from injury sites, careless transportation to hospital, inadequate acute management and lack of pre-hospital care.

Falling from a height, either from trees, construction works, electric poles or roofs, was found to be the most common cause (40.30%) of SCI in this study. This is similar to other studies. In Bangladesh, 43% of SCI is caused by falling from a height (Hoque et al, 1999), in India it is 55% (Chacko et al,1986), in Thailand it is 43% (Kovindha,1985), and in Nigeria it is 48% (Okonkwo,1988).

Falling while carrying a heavy load on the head is the second most common cause (16%), usually resulting in tetraplegia. This is common in Bangladesh and India. Persons who acquire such injuries are usually day labourers, who regularly carry 60-100 kg loads on their heads. This unacceptably heavy weight-bearing on the head needs to be stopped by spreading awareness among workers and employers, as well as by the proper imposition of existing laws. In contrast, in developed countries like USA, motor vehicle accidents are the leading cause of SCI (44%), followed by acts of violence (24%), falls (22%), sports (8%) and others (2%) (Breithaupt et al, 1961).

It was found that only 16.4% of the study population survived for 10 years, which was much lower than figures for various developed countries where a 10 year survival rate was observed in around 80% of affected persons. This inconsistency may be due to different causes of injury, inadequate acute management, lack of proper social reintegration, less attention or care by family/community/state, and inability to treat the co-morbidity of persons with SCI.

The study showed that more than 80% of the persons with SCI had died at home. This finding was inconsistent with those of other studies regarding place of death. In England and Wales, more than half of all deaths (58.3%) occurred in hospital (Zeilig et al,2000; Barclay & Arthur,2008), with evidence of a slow but steady decline in deaths occurring at home, and a rising proportion of deaths in hospital.

An epidemiological study in Denmark (Hartkopp et al, 1997) showed that 57.3% of patients died in hospital and 42.7% at home.

The higher number of deaths of persons with SCI at home in the present study may indicate the negative social acceptance of such people, lack of proper reintegration in society, want of optimum care at home and poor quality of life following discharge from hospital.

In conclusion, life expectancy among persons with SCI in Bangladesh is much lower than in the developed countries, though there is great difficulty in comparing such results as a consequence of methodological differences. It is recommended that further research be done, on a larger scale and with international standardisation of methods, to achieve more accurate and comparable results.

Limitations

Due to the unavailability of reliable data, it was not possible to compare some of the important prognostic factors such as neurological levels, extent of lesions and cause of deaths. A relatively small sample size is the other limitation of this study.

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