Traumatic spinal cord injuries in Thailand: an epidemiologic study in Siriraj Hospital, 1989–1994

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The records of 219 patients with spinal cord injuries admitted to the Siriraj Hospital, Bangkok from January to December 1994 were reviewed retrospectively. The average patient age was 32.8 years (range = 12–75 years); the male/female ratio was 5.6:1. The most common cause of injury was road traffic accident (50.7%), followed by falls (31%), assault (8.7%) and being hit by moving objects (7.8%). As a result of the injury, 52 (23.7%) patients were tetraplegic, 58 (26.5%) were tetraparetic, 63 (28.8%) were paraplegic and 46 (21.0%) were paraparetic. The mortality rate was 16%. The leading cause of death was a respiratory complication, accounting for 89% of the total deaths.

Keywords: spinal cord injury; epidemiology; Thailand

Introduction

Traumatic spinal cord injury (SCI) is an important public health problem for several reasons; it usually results in irreversible neurological damage and leads to high rates of morbidity and mortality. The victims require intensive medical care and rehabilitation to maximize their functional capacities. In addition, SCI has a major economic impact on the patient's family and on society. Knowledge of the causes of such injuries could assist the development of prevention and control programmes.

Recent studies have demonstrated certain differences between the causes of SCI in developing and in developed countries.^{1–4} In Thailand, there has been only one study, from Maharaj Nakorn Chiang Mai, a large hospital in the north;⁵ the situation may differ in Bangkok or in rural areas. This study investigated the pattern of SCI in Thailand using records from a major hospital in Bangkok.

Methods

Hospital records of all patients with traumatic SCI who were admitted to Siriraj Hospital, Bangkok, between January 1989 and December 1994 were analyzed retrospectively. Only first admissions were included.

Spinal cord injury was defined according to Kraus *et al.*;⁶ functional disability was classified according to the American Spinal Injury Association.⁷

Results

Records were available for 186 males and 33 females, aged from 12 to 75 years. Half of the SCI were caused

by traffic accidents and half of those involved motorcycles (Table 1); only nine records indicated drunkenness associated with these accidents. The other major cause of SCI was falling, particularly among construction workers and retired people.

The mean age of patients was similar for injuries due to various causes, except that patients who were injured by falling from the same height were older and most in this group sustained a cervical hyperextension injury (Table 2). There was a positive association between paraplegia and falling from a height (Chi-square test and Fisher exact test, $P < 0.05$). There was no difference between the number of cervical and thoracic/lumbar injuries due to other causes.

Mortality rate and causes of death

There were 28 deaths during initial acute care hospitalization. The majority (68%) were of individuals with a complete cervical cord injury. The leading cause of death was respiratory complications (89%). One patient died from an undiagnosed perforated duodenal ulcer and the others died from sepsis of unknown origin.

Discussion

In this review of patients with SCI admitted to a Bangkok hospital we found that the average age at the time of injury and the age distribution of traumatic SCI were similar to those reported in previous studies.^{6,8–12} Men were more frequently injured than women, with a ratio of 5.6:1, this is slightly higher than the results from Chiang Mai (5:1),⁵ Brazil

Table 1 Causes of spinal cord injuries

Cause	No	
	Male	Female
Fall		
from a height	49	11
from the same level	5	2
Traffic accident		
Car, truck	27	6
Motorcycle	60	4
Bicycle	2	2
Pedestrian	8	2
Assault		
Sharp object	3	0
Bullet	13	0
Blown object	2	0
Hit by moving object	12	5
Suicide	1	0
Sport	0	1
Others	3	0

Table 2 Causes of injury, neurological deficit and age at the time of injury

Cause	Tetraplegia		Paraplegia		Age at injury (years)
	I	C	I	C	
Fall from a height	9	13	18	20	35
Fall from the same level	3	2	2	0	47
Traffic accident	36	27	19	29	32
Assault	4	5	4	6	32
Hit by moving object	4	4	2	7	33
Others	2	1	1	1	31
Total	58	52	46	63	
	(26.5%)(23.7%)(21.0%)(28.8%)				

*I = Incomplete. C = Complete

(3.9:1)³ and Turkey (3.7:1)¹³ and much higher than the ratio of 2.59:1 reported for Switzerland.¹⁴ The variation is due to different socio-economic and cultural backgrounds, and may change over time, for example the ratio in Japan fell from 9.64:1 in 1969–1974 (cited in Kuhn)¹⁴ to 4:1 in 1990–1992¹⁵ and the ratio in Denmark¹⁶ fell from 5.2:1 in 1965–1974 to 3.3:1 in 1975–1984.

The leading cause of SCI in this study was traffic accidents, as has been observed in other studies; however, in Western countries most of these accidents involve cars, whereas in Thailand half result from motorcycles. This reflects the high use of motorcycles in Thailand, as occurs in other developing countries, where cars are expensive and public transport is often inadequate.

The second cause of SCI was falling from a height: in Bangkok this is due to accidents in the construction industry, in rural areas it is due to agricultural workers falling from trees while pruning or harvesting produce. In the Chiang Mai study,

falling from height was the most common cause of SCI (43%), followed by traffic accidents (28%); this agrees with the more rural type of population in northern Thailand. Only one injury in this study resulted from sport: this is because few people in developing countries participate in high-risk sports such as rugby, football, horse riding or skiing.

The mortality rate may be higher than is observed in this study, since patients who died before hospitalization were not included.

The results of our study show that prevention campaigns should be targeted at road users, particularly riders of motorcycles, and workers in the construction industry and in agriculture. Stricter safety regulations and good public education are required to reduce the occurrence of accidents and thereby of SCI in Thailand and in other developing countries.

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