Original Article

Retrospective evaluation in spinal cord injuries: a sample at Universty Hospital in Turkey

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Objective: To evaluate the patients with Spinal Cord Injuries (SCIs) seen at Pamukkale University Hospital between 2005-2013.
Methodology: 489 (236 female, 253 male) patients with SCIs were evaluated retrospectively.
Results: Their mean age was 48.20±18.95 years. SCIs were caused by trauma in 316(64.6%), spinal tumors in 119(24.3%) and congenital anomalies in 54(11%) patients. Injury levels were as follows: 155(31.7%) lumbar level, 144(29.4%) thoracic, 114(23.3%) cervical, 35 (7.2%) both thoracic and lumbar spine, 10(2%) both cervical and thoracic and 31(6.3%) in the other levels.
Conclusion: The main reason for SCIs was trauma. Thus, public education is vital in order prevent to trauma. (Rawal Med J 201;40: 183-186).
Key Words: Spinal cord injury, trauma, spi8nal tumors.

INTRODUCTION

Spinal cord injuries (SCIs) are rarely seen, but are associated with devastating physical psychological and economic consequences.[1-3] These injuries are usually seen in young people. SCIs are among the most important causes of disability, morbidity, mortality, and economic loss.[4-6] There is no curative treatment for SCIs, prevention of SCIs is very important. Investigating the epidemiological pattern of SCIs is the first step in planning for preventive strategies.[4,7] Annually incidence of SCIs has been reported as 28-51/1000000 in USA and 6-56/1000000 in developed countries and 10.000 new cases occur each year.[8,9]

In Asia, the incidence ranged from 12.06 to 61.6 per million with average age from 26.8 to 56.6 year and men were at higher risk than women.[10] On the other hand, the incidence in developing countries is 25.5/million/year and ranges from 2.1 to 130.7/million/year, mostly males with age 32.4 years.[11] Epidemiological data on SCIs in Turkey are unfortunately insufficient. However, some studies report an annual incidence of SCIs of 12.7/1,000,000.[12,13] The goal of this study was to describe the demographics and etiological factors of the patients with SCIs seen at our hospital.

METHODOLOGY

This study was performed at Department of Neurosurgery, Probel Hospital, Pamukkale University, Denizli, Turkey and a total of 7410 patients records were reviewed retrospectively that were seen from January 2005 and December 2013. SCIs were noted for 489 patients. Data collected included patient age at the time of injury, gender, etiology of injury and level of injury. All patients were taken to the physical therapy program during their hospitalization.

Statistical analysis was performed with SPSS v. 16.0.

RESULTS

The study included 489 patients with SCIs. The mean age of the patients was 48.20±18.95 (range 1-89). 253(51.7%) were males and 236 (48.3%) were females. Mean age of males was 47.08±17.37 years and mean age of females was 49.39±20.49 years (Table 1). Trauma was the commonest cause of SCI and thoracic and lumber levels were the commonest levels of injury (Table 2).

Table 1. Demographic characteristics of patients with SCIs (n=489).

	Number	%
Gender		
Male	253	51.7
Female	236	48.3
Age (Years)		
0-10	11	2.2
11-20	30	6.1
21-30	54	11.0
31-40	79	16.2
41-50	90	18.4
51-60	89	18.2
61-70	71	14.5
71-80	53	10.8
81-90	12	2.5

Table 2. Distribution of injury causes and levels.

	Number (%)
Injury causes	
Trauma	316(64.6)
Spinal Tumors	119(24.3)
Congenital Anomalies	54 (11)
Injury Levels	**n(%)**
Lumbar	155(31.7)
Thoracic	144(29.4)
Cervical	114 (23.3)
Thoracal + Lumbar	35(7.2)
Cervical + Thoracic	10 (2)
Others	31 (6.3)

Table 3. Distribution of gender according to year.

Year	Male (%)	Female n (%)	Total n (%)
2005	16 (37.2)	27 (62.8)	43 (100)
2006	42 (53.2)	37 (46.8)	79 (100)
2007	45 (59.2)	31 (40.8)	76 (100)
2008	37 (50.7)	36 (49.3)	76 (100)
2009	26 (55.3)	21 (44.7)	47 (100)
2010	27 (57.4)	20 (42.6)	47 (100)
2011	19 (47.5)	21 (52.5)	40 (100)
2012	25 (46.3)	29 (53.7)	54 (100)
2013	16 (53.3)	14 (46.7)	30 (100)

Table 4. Distribution of injury, causes and injury levels according to year.

Years	Injury Causes	n (%)	Injury Levels	n (%)
2005	Trauma Spinal Tumors Congenital Anomalies	21 (48.8) 18 (41.9) 4 (9.3)	Lumbar Thoracic Cervical Thoracic + Lumbar Others	17 (39.5) 10 (23.3) 8 (18.8) 4(9.3) 4(9.3)
	Total	43 (100)	Total	43 (100)
2006	Trauma Spinal Tumors Congenital Anomalies	46 (58.2) 21 (26.6) 12 (15.2)	Lumbar Cervical Thoracic Cervical+ Thoracic Thoracic + Lumbar Others	24 (30.4) 23 (29.1) 16 (20.3) 1 (1.3) 7 (8.9) 8 (10.1)
	Total	79 (100)	Total	79 (100)
2007	Trauma Spinal Tumors Congenital Anomalies	53 (69.7) 18 (23.7) 5 (6.6)	Thoracic Lumbar Cervical Cervical+ Thoracic Thoracic + Lumbar	33(43.4) 20 (26.3) 14 (18.4) 1 (1.3) 8 (10.5)
	Total	76 (100)	Total	76 (100)
2008	Trauma Spinal Tumors Congenital Anomalies	51 (69.9) 13 (17.8) 9 (12.3)	Lumbar Thoracic Cervical Cervical+ Thoracic Thoracic + Lumbar Others	23 (31.5) 22 (30.1) 18 (24.7) 4 (5.5) 4 (5.5) 2 (2.7)
	Total	73 (100)	Total	73 (100)
2009	Trauma Spinal Tumors	31 (66.0) 16 (34.0)	Lumbar Cervical Thoracic Cervical+ Thoracic Thoracic + Lumbar Others	16 (34.0) 12 (25.5) 12 (25.5) 2 (4.3) 3 (6.4) 2 (4.3)
	Total	47 (100)	Total	47 (100)
2010	Trauma Spinal Tumors Congenital Anomalies	31 (66.0) 8 (17.0) 8 (17.0)	Thoracic Lumbar Cervical Cervical+ Thoracic Thoracic + Lumbar Others	18 (38.3) 15 (31.9) 5 (10.6) 1 (2.1) 2 (4.3) 6 (12.8)
	Total	47 (100)	Total	47 (100)

Years	Injury Causes	n (%)	Injury Levels	n (%)
2011			Thoracic	13 (32.5)
	Trauma	30 (75.0)	Cervical	12 (30.0)
	Spinal Tumors	3 (7.5)	Lumbal	12 (30.0)
	Congenital Anomalies	7 (17.5)	Thoracic + Lumbar	2 (5.0)
			Others	1 (2.5)
	Total	40 (100)	Total	40 (100)
2012			Lumbar	20 (37.0)
	Trauma	36 (66.7)	Cervical	16 (29.6)
	Spinal Tumors	12 (22.2)	Thoracic	10 (18.5)
	Congenital Anomalies	6 (11.1)	Thoracic + Lumbar	3 (5.6)
			Others	5 (9.3)
	Total	54 (100)	Total	54 (100)
2013			Thoracic	10 (33.3)
	Trauma	17 (56.7)	Lumbar	8 (26.7)
	Spinal Tumors	10 (33.3)	Cervical	6 (20.0)
	Congenital Anomalies	3 (10)	Cervical + Thoracic	1 (3.3)
			Thoracic + Lumbar	2 (6.7)
			Others	3 (10.0)
	Total	30 (100)	Total	30 (100)

Distribution of gender according to years is shown in Table 3 and causes of injury and level of injury according to years in Table 4.

DISCUSSION

The ratio of males affected from SCIs was 51.7% and ratio of females was 48.3%. Trauma was the commonest cause of injury followed by spinal tumors and congenital anomalies. Levels of injury was highest in the lumbar region followed by the thoracic, cervical, both thoracic and lumbar spine, both cervical and thoracic and other levels. Previous studies reported that SCIs is 4 fold greater among males compared to females.[2,3,11] Recent studies indicate that SCIs exposure is 82.8% among young males.[10]

Traumatic causes are the first leading cause among etiology of SCI. Öneş et al reported that SCI 67.53% arise from traumatic and 32.47% from non-traumatic causes.[14] Another study reported that trauma was the most common cause of SCI followed by 36-48% motor vehicle accidents, 5-29% act of terrorism, 17-21% falls and 7-16 sports and entertainment activities, while tumors and transverse myelitis were among non-traumatic causes of SCI.[15] According to epidemiologic data published in Turkey in 2000, causes of SCI were reported as traffic accidents (48.8%), falls (36.5%), stab wounds (3.3%), gunshot wounds (1.9%) and plunging into water (1.2%).[9,10,16,17] Results of our study are consistent with literature and 64.6% of injuries were due to trauma.

When level of injuries was analyzed, it was found that lumbar region was affected most followed by thoracic region (29.4%). Gür et al reported in 2005 that L1 level was affected most.[8] In the study of Hamamcı et al from Ankara in 1994, 54.76% of SCIs were in thoracic region.[18] In the study of Tuğcu et al, thoracic region was seen to be affected in 54% of patients, lumbar region in 30% and cervical region in 8%.[5] Similarly, in a systematic study which prospectively analyzed the epidemiologic data of SCI seen in Asia between 1980- 2011, thoracic region was found to be affected most.[10] However, studies reporting different results are also available. Today, injuries of upper levels of spinal cord have been encountered more due to increased use of motor vehicles and violent sports.[4,10] Chen et al reported that 58.2% of SCI affected cervical region.[15] A weakness of this study is that we did not follow long-term outcomes and there are not the ASIA scores of the patients.

CONCLUSION

Our study showed that the main reason led to spinal cord injuries was trauma. That's why training program of the persons is required to prevent trauma. In addition, the required first aid's being applied correctly in the shortest time and transferring the patient to a correct health center has a great importance.

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