

An Observational Assessment of the Clinic-Demographic Profile of the Patients with Traumatic Spinal Injuries

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Conflict of interest: Nil

Abstract

Aim: Epidemiological analysis of traumatic spinal injuries in Bihar, India

Methods: This Observational study conducted in the Department of Neurosurgery, IGIMS, Patna, Bihar, India for 1 year. All the 100 patients of traumatic spinal injuries admitted in our hospital were included in this study. Detailed history with respect to age, sex, occupation, education, socio-economic status and mode of trauma was taken, followed by a clinic-radiological examination to ascertain the exact spinal and associated injuries.

Results: Total 100 patients with traumatic spine injury included in study. Out of these there is 68(68%) were male and 32 (32%) were female. Male to female ratio was 2.12:1. In our study most common mode of injury was fall from height like unprotected roof, uncovered well, construction work, tree, electric pole in 45cases (45%), followed by road traffic accident in 42 cases (42%). other cause of injuries were assaults in 7 cases (7%) and sports in 6 cases (6%). In our study lumber spinal column was fractured in 56cases (56%) followed by thoracic spine in 22 cases (22%). Cervical spine injuries noted in 20cases (20%). Sacral spine injuries noted only in 2 cases (2%) but it associated with abdominal and pelvic injuries. Out of 100 cases of Traumatic Spinal Injuries 32 cases (32%) found to be had other associated injuries. Most common of them was head injuries in 10 cases (10%) and extremities injuries 10 cases (10%) followed by chest injuries 6cases (6%), abdominal injuries 3 cases (3%) and pelvic injuries 3 cases (3%).

Conclusion: TSI is major source of morbidity and mortality in Bihar, India like throughout the world. Accidental fall and RTA are major cause of TSI. Prevention remains the most effective way to reduce the burden of the traumatic spinal cord injuries.

Keywords: RTA, Spinal Cord, Injury.

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Introduction

The importance of epidemiological studies in planning prevention strategies as well as clinical and community services for persons with spinal cord injury (SCI) is well established. They provide a baseline to monitor the effectiveness of interventions[1] They help in prioritization

for resource allocation and thus should be especially helpful for developing countries, which have limited resources[1,2]

Epidemiology of a particular ailment is linked to social, environmental, cultural and biological issues and thus varies from region to region[2]However, despite its

importance, there are hardly any proper epidemiological studies from developing countries. Because of the inherent difficulties in carrying out epidemiological studies, experts in countries like India resort to demographic studies for information.

In Most of cases mode of injuries by fall from height (unprotected roofs, trees, construction site, electric pole fall into uncovered wells) and RTA, which in fact are preventable or reducible causes by taking proper safety measure and strictness in following rules and regulations. A careful epidemiological study can provide information regarding magnitude of the problem of spinal trauma and resultant demand of medical and social resources. It can help to identify the risk factors involved and actual mode of spinal injuries. It also helps to formulate preventive measures / planning's which may modify or eliminate the risk factors and may decrease the incidence of this incapacitating injury.

Material and methods

This Observational study was conducted in the Department of Neurosurgery, IGIMS, Patna, Bihar, India, for 1 year.

Methodology

All the 100 patients of traumatic spinal injuries admitted in our hospital were included in this study. Patients who died before reaching hospital were not considered for study. Detailed history with respect to age, sex, occupation, education, socio-economic status and mode of trauma was taken, followed by a clinico radiological examination to ascertain the exact spinal and associated injuries.

The patient's data was entered in MS Excel sheet and analysis through SPSS 21.0 Software done. All applicable statistical tests were used for data analysis.

Results

Total 100 patients with traumatic spine injury included in study. Out of these there is 68(68%) were male and 32 (32%) were female. Male to female ratio was 2.12:1. The most prevalent age group in our study was 30-39 years in 35 cases (35%) followed by 20-29 years in 21 cases (21%).

Table 1: Age-sex distribution of TSI

Age group (Years)	Number	%
0-9	0	0
10-19	10	10
20-29	18	21
30-39	35	35
40-49	21	18
50-59	10	10
60-69	4	4
>70	2	2
	100	100

In our study most common mode of injury was fall from height like unprotected roof, uncovered well, construction work, tree, electric pole in 45cases (45%), followed by road traffic accident in 42 cases (42%). other cause of injuries were assaults in 7 cases (7%) and sports in 6 cases (6%).

Table 2: Aetiology of TSI

Mode of injury	N(%)
Fall from height (roof, tree, electric pole)	45 (45%)
Road traffic accident	42(42%)
Fall of heavy objects or sports	6 (6%)
Assault	7 (7%)

In our study lumber spinal column was fractured in 56cases (56%) followed by thoracic spine in 22 cases (22%). Cervical spine injuries noted in 20cases (20%). Sacral spine injuries noted only in 2 cases (2%) but it associated with abdominal and pelvic injuries.

Table 3: Level of spinal injuries distributions

Level of spine/site	No of cases
Cervical	20 (20%)
Thoracic	22 (22%)
Lumbar	56 (56%)
Sacral	2 (2%)

Out of 100 cases of Traumatic Spinal Injuries 32 cases (32%) found to be had other associated injuries. Most common of them was head injuries in 10 cases (10%) and extremities injuries 10 cases (10%) followed by chest injuries 6cases (6%), abdominal injuries 3 cases (3%) and pelvic injuries 3 cases (3%).

Table 4: Other Associated injury

Head	10(10%)
Chest	6(6%)
Abdomen	3(3%)
Pelvic	3(3%)
Extremity	10(10%)

Discussion

Traumatic spinal cord injuries produce profound emotional and psychological impact on personal and family's life.

Epidemiological and demographic distribution data of TSI in our country is essential for strengthening the health care facility, taking preventive measure along with conservative treatment and rehabilitation of patients. So many studies from developed countries available in the matter of traumatic spinal injuries but their epidemiological data are different to Indian scenario. This is because of difference in literacy, occupation, available health care facilities and demographic distribution of population in developed countries. The age distribution of patients of our studies is comparable with studies from the other parts of the India and World. The most

prevalent age group in our study was 30-39 years in 35 cases (35%) followed by 20-29 years in 21 cases (21%) that is similar to other studies[3,5]

In previous study younger age group male are more prone to spinal injury due to more outdoor, occupational activity and driving activities[6,7]

In older age group female is more risk than male for traumatic spinal injuries due to osteoporotic bony changes.

In our study Sex distribution has shown a male predominance with Male to female ratio was 2.12:1 that is comparable to other recent studies[3,4,7,9]

There is gradually changing trend in society where females are more actively participating in earning activity like working at constructional site, driving the vehicle and other outdoor activities.

In rural areas agriculture being the main profession where females are

Also equally participate in work, so male-female ratio gradually decreases As compared to studies conducted 15 to 20 year's back[5,10,13]

Table 6: Comparison of sex ratio in deferent series

Series	M:F ratio
Cheko et al(India)	13.5:1
Shanmugasundram (India)	8.98:1
Lan et al (Taiwan)	4:1
Shingu et al (japan)	4.3:1
David chen (India)	3.7:1
Karachan et al (Turkey)	2.5:1
Roop singh et al (India)	2.96:1
Present study (India)	2.12:1

In our study most common mode of injury was fall from height like unprotected roof, construction work, tree, electric pole (45%), followed by road traffic accident (42%). In study of R. Singh et al also most common cause of injury was fall from height including roof, trees, electricity pole (44.5%) followed by Motor vehicle accidents (42%) that is almost similar to our study.[14]

Mode of TSI depends on local factor like occupation, literacy, strictness of traffic rules and regulation[4,5,10]

Like other developing countries there is tremendously increase in number of vehicles which is not proportion to quality of road in India further raises the incident in of road- traffic accident in younger group of people

Table 7: Comparison of mode of injuries in different series

Series	Fall from height (%)	RTA (%)
Chacko et al (India 1986)	55.2	12.8
Lan et al (Taiwan,1993)	23.3	61.6
Shingu et al (Japan, 1994)	29.2	44.6
Karachan et al (Turkey,2000)	36.5	48.8
Birua et al (India,2018)	59.42	35.08
Present study	45	42

In our study lumber spinal column was fractured in 56 cases (56%) followed by thoracic spine in 22 cases (22%). Cervical spine injuries noted in 20cases (20%) that results are similar to other studies like ville niemi et al[15]

The dorsal spine is fixed and less mobile because of rib cage as compared to lumbar spine which is very mobile portion of spine. The sudden transition from fixed to mobile portion makes dorso-lumbar area as a precarious site for TSI[14]

In our study highest incidence of traumatic spinal injuries noted in summer (may-june) that is similar to studies of G J S Birua et al[16]

It can be explained by more agriculture and social activities in summer season and people try to confined in their home in rainy and winter season.[14,16]

Conclusion

TSI is major source of morbidity and mortality in bihar, India like throughout the world. Accidental fall and RTA are major

cause of TSI. Prevention remains the most effective way to reduce the burden of the traumatic spinal cord injuries.

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