PATTERN OF TRAUMATIC SPINAL CORD INJURY AND ITS MANAGEMENT IN A RURAL HOSPITAL

Girish Balasaheb Mote[1], Chandrashekhar Martand Badole[2], Kiran Narayanrao Wandile[3], Kisan Rajaramji Patond[4]

[1]Resident, Department of Orthopaedics, Mahatma Gandhi Institute of Medical Sciences, Sevagram, Wardha.
[2]Professor and HOD, Department of Orthopaedics, Mahatma Gandhi Institute of Medical Sciences, Sevagram, Wardha.
[3]Associate Professor, Department of Orthopaedics, Mahatma Gandhi Institute of Medical Sciences, Sevagram, Wardha.
[4]Professor, Director and Dean, Department of Orthopaedics, Mahatma Gandhi Institute of Medical Sciences, Sevagram, Wardha.

ABSTRACT

BACKGROUND

Understanding the current epidemiology of acute traumatic spinal cord injury is essential for public resource allocation and primary prevention. The spinal cord injured patient is congregated early in spinal unit where better facilities and dedicated expert care exists the outcome of treatment and rehabilitation can be improved. The objective of this study, therefore, is to know how traumatic spinal cord injury patients are being treated at rural area of India and to suggest step to improve the quality of care of the traumatic cord injury patients in rural population of the Indian setup.

MATERIALS AND METHODS

A total of 203 patients were retrospectively studied by analysing the data from hospital information system (computerised medical database) between January 2005 to October 2016 of all patients treated for spinal cord injury at Mahatma Gandhi Institute of Medical Sciences and Kasturba Hospital, Sevagram, a rural hospital of central India. Variables analysed include age, gender, length of hospitalisation, type and mechanism of injury, associated spinal fracture and neurologic deficit and treatment.

RESULTS

Total 203 cases were analysed. 172 (84.72%) of the spinal cord injury patients were male and the mean age was 45.5 years (range 9-82 years). 111 (54.67%) cases of the spinal cord injury patients occurred from fall from height. Average hospital stay was 37 days (range 1-73 days). 113 (55.66%) of the spinal cord injury patients were cervical, 44 (21.67%) were dorsal and 46 (22.66%) were lumbar region. 77 (37.93%) cases were surgically treated and 126 (62.06%) cases were managed conservatively. 4 (1.97%) cases were died during the hospitalised period.

CONCLUSION

A large proportion of injury was seen among the young age group predominantly as result of fall. Prevention program should expand their focus to include safety and avoidance of fall. Awareness on the part of general population, attendants of the patients, clinical and paraclinical team regarding spinal cord injury need to be addressed. For better outcome, we re-emphasise the need to establish and congregate these patients into spinal trauma centre.

KEYWORDS

Spinal Cord Injury, Trauma, Hospital Care, Treatment Outcome and Rehabilitation.

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BACKGROUND

Traumatic Spinal Cord Injury (SCI) often results in profound and long-term disability, which is life changing for the injured individual and his/her family. These injuries also have tremendous social costs associated with expensive healthcare treatment, rehabilitation and lost productivity.[1,2]

Epidemiological studies provide local estimate of incidence and prevalence, identify the high-risk group and thus provide insight into priorities for resource allocation, aetiologic research and prevention efforts, they also provide a baseline from which to gauze the effectiveness of intervention.[3] Despite the ongoing research in the treatment of Spinal Cord Injury (SCI) this condition is not yet amenable to complete restoration of function, which is a big obstacle in independent living of the victim. Often spinal cord injured patients are of the younger age group.[4] Most of these patients are managed at centres without spinal trauma centre. The physical, personal, financial and social impact of spinal cord injury is such that most patients are lost in follow up or succumb to life-threatening complications associated with spinal cord injury. However, inadequate precaution during transportation can cause further injury to the already compromised spinal cord in spinal injured patients.[5] Early surgery and comprehensive rehabilitation markedly reduces the overall morbidity of spinal cord injured patients by

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Corresponding Author:
Dr, Girish Balasaheb Mote,
Resident, Department of Orthopaedics,
Mahatma Gandhi Institute of Medical Sciences,
Sevagram-442102.
E-mail: girishmotekop@gmail.com
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enabling the patient to lead an independent life.[6,7,8] Our goal were to determine the regional epidemiology and demography of SCI, describe clinical syndrome and severity and asses treatment of SCI. Since, there are few studies available,[9,10] which discuss the problems faced by spinal cord injured patients in rural population of Indi, the study was conducted to assess such problem and to analyse them in order to make improvements in present Indian setup.

MATERIALS AND METHODS

A search of the data of spinal cord injury was done from computerised medical records database identified all patients treated for spinal cord injury between January 2005 and October 2016. All these patients with traumatic spinal injuries reported to the accident and emergency department and admitted to Orthopaedic Ward of Kasturba Hospital and Mahatma Gandhi Institute of Medical Sciences, Sevagram, Wardha. Detailed history with respect to include age, gender, length of hospitalisation, type and mechanism of injury, associated spinal fracture, neurologic deficit and treatment were recorded. A total of 203 patients were available for final analysis. All the cases were graded as per ASIA grades. All these patients were given Inj. Methylprednisolone in proper dosage according to weight of the patient. Primary care was taken in all the patients in the form of crutch field tong, cervical collar, lumbar belts and supportive care like chest physiotherapy, catheterisation, Ryle's tube, intubation, tracheostomy, IV fluids regular physiotherapy to prevent bedsore and definitive treatment was carried out with various implants for different level of injury and patients were managed intraoperatively and postoperatively and discharged from the hospital with proper advice for follow up.

RESULTS

203 patients of spinal cord injury were analysed. There were 172 (84.73%) males and 31 (15.27%) females, male-to-female ratio was 5.49:1. The average age at injury was 45.5 years. The most prevalent age group was 30-39 followed by 40-49 as per Table 1.

The most common cause of injury was fall from height 111 (54.67%) followed by road traffic accident 91 (44.82%) and 1 (0.49%) case of railway trauma as per Table 2.

Out of 203 patients, 113 (55.66%) had cervical injury and 46 (22.66%) lumbar spine injury followed by 44 (21.67%) dorsal spine injury. Patients presented with neurological deficit were 184 (90.64%). Among these 184 patients, 86 patients were having complete neurological deficit in the form of quadriplegia and paraplegia and 98 cases were having incomplete neurological deficit in the form of quadriparesis and paraparesis. These cases of spinal cord injury were graded as per ASIA grades. Grade A (complete) 86 cases, Grade B (incomplete) 13, Grade C (incomplete) 36, Grade D (incomplete) 49 and Grade E (normal) 19 as per Table 3.

Out of 203 patients 81 (39.90%) cases were managed surgically and 122 (90.10) cases were managed conservatively as per Table 4 and Figure 1, 2, 3 and 4.

The mortality was in 4 (1.97%) patients (3 from surgical and 1 from conservative). The length of hospital stay ranged from longest 73 days to minimum 1 day with average 37 days.

DISCUSSION

The abrupt onset of SCI is tragic and has profound impact on the individual and their family. Knowledge of epidemiology of SCI is important not only planning of resources, but also for adequate treatment and rehabilitation. Management of spinal cord injured patients in spinal unit with dedicated experts and facilities for comprehensive rehabilitation improves the outcome.[11] A very few spinal centres have been established in India and hence the management of most of the victims of spinal injuries takes place in general hospitals and medical institutions. Very few afford to reach to the corporate and big hospitals. Our institution to start with the first rural medical college of the country with postgraduate and super speciality services. This hospital get the patients from the Vidarbha region of Maharashtra and partly from Andhra Pradesh (Telangana) and Madhya Pradesh. These patients come from the remote areas and also as a referral from various hospitals including private practitioner of the region with various financial background and knowledge regarding the spinal injuries. Most of these patients transported by the private vehicles. 80% of India's population live in rural areas and it seems highly probable that our figures and others from India[12] would reflect the pattern of spinal injuries in India as a whole.

Males were found to be more prone for spinal cord injury in our series, which is similar finding in other study as they are more engaged in outdoor work on account of occupation and hence are more prone for spinal cord and/or other trauma.[5,9,11] Our study also reflects the adult population being the most susceptible for spinal cord injury and the age distribution of patient is comparable with other studies.[7,8,9] In India, most of the spinal cord injury resulted from fall from height followed by road traffic accident.[7] Possible cause of variation could be houses lack essential fencing of the terrace and guarding of the staircase, thereby making fall from height, a realistic possibility in study.[7] Lack of strict implementation of traffic rules in various places of India along with lack of awareness among the general population regarding adherence to the traffic rules still prevails as an important cause of road traffic accident and spinal trauma. However, most of the spinal cord injuries resulted from road traffic accident reported by the other author.[13,14] In advanced countries RTA rank highest.[15,16] There is gradual trend towards increasing incidence of RTA indicating gradual urbanisation of the society and increase in the number of vehicles on road in India.

In present series, we observed the maximum number of cases belongs to cervical spine injury. This could be attributed because of most of the patients presented after a fall from height and also selective referral of these cases to our centre because of lack of facilities as well as expertise to manage cervical spinal cord injury. One of the author has

reported the maximum incidence of cervical spine injury in his study.[10] However, dorsolumbar spine injury was found to be commonest reported by another author.[9] Early surgical treatment is beneficial in terms of reducing complications, length of stay and hospital cost.[8] Urgent decompression in acute cervical spinal cord injury remains a reasonable practice option and can be performed safely. Early decompression and stabilisation of injured spinal cord is an area that still overlooked in the Indian setup. In present study, we decompress those cervical spine with neurological deficit and anatomical instability as early as possible. There is tremendous lack of basic infrastructure and trained medical personnel, especially in rural area involved in initial management of patients. Vast majority of people lack basic knowledge about the initial immobilisation and transportation of these patients to higher patients and by the time patient reaches a general or institutional hospital, there may be an extensive damage to neurological status, which could be prevented. There is a need to setup more specialised spinal trauma centre across the country with good accessibility to poorer sections of society for comprehensive management of spinal cord injured patients.

CONCLUSION

A large proportion of injury was seen among the young age group predominantly as result of fall. Prevention program should expand their focus to include safety and avoidance of fall. Awareness on the part of general population, attendants of the patients, clinical and paraclinical team regarding spinal cord injury need to be addressed. For better outcome, we re-emphasise the need to establish and congregate these patients into spinal trauma centre.

Mode	Number	Percentage (%)
Fall	111	54.67
RTA	91	44.82
Others (Railway Accident)	1	0.49

Table 1. Age and Sex Distribution of SCI Cases (Total Number of Cases n=203)

Grades	Number of Cases	Percentage
A (Complete)	86	42.3
B (Incomplete)	13	6.40
C (Incomplete)	36	17.73
D (Incomplete)	49	24.13
E (Normal)	19	9.36

Table 2. Mode of Injury (Total Number of Cases n=203)

Age Group (Years)	Males (n=172) No. (%)	Females (n=31) No. (%)	Total (n=203) No. (%)
0-9	- (-)	1 (3.22)	1 (0.49)
10-19	3 (1.74)	1 (3.22)	4 (1.97)
20-29	28 (16.27)	6 (19.35)	34 (16.75)
30-39	43 (0.25)	4 (12.90)	47 (23.15)
40-49	34 (19.76)	8 (25.80)	42 (20.69)
50-59	31 (18.02)	6 (19.35)	37 (18.22)
60-69	21 (12.21)	3 (9.67)	24 (8.86)
70-79	10 (5.81)	2 (6.45)	12 (5.91)
80+	2 (1.16)	- (-)	2 (0.98)

Table 3. Pattern of Injury According to ASIA Grading (Total Number of Cases n=203)

Region Involved	Total Number of Cases (n=203) No. (%)	Surgically Treated (n=77) No. (%)	Conservative (n=126) No. (%)
Cervical	113 (55.66)	33 (42.85)	80 (63.49)
Dorsal	44 (21.67)	24 (31.16)	20 (15.87)
Lumbar	46 (22.66)	20 (25.97)	26 (20.63)
	Total (n=203)	77 (37.93)	126 (62.06)

Table 4. Pattern of SCI (Total Number of Cases n=203)

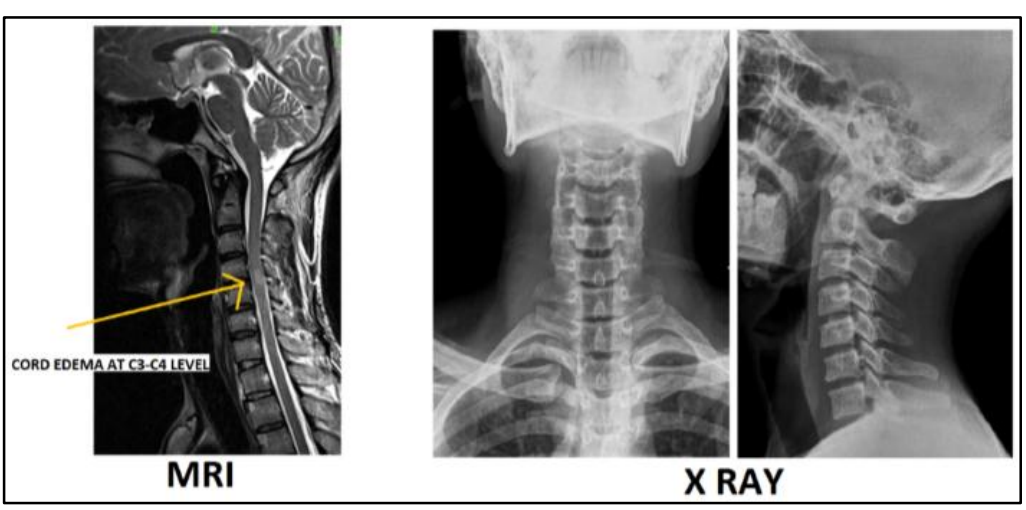

Figure 1. Case of SCI of Cervical Region showing no fracture or subluxation – Only Cord Edema.

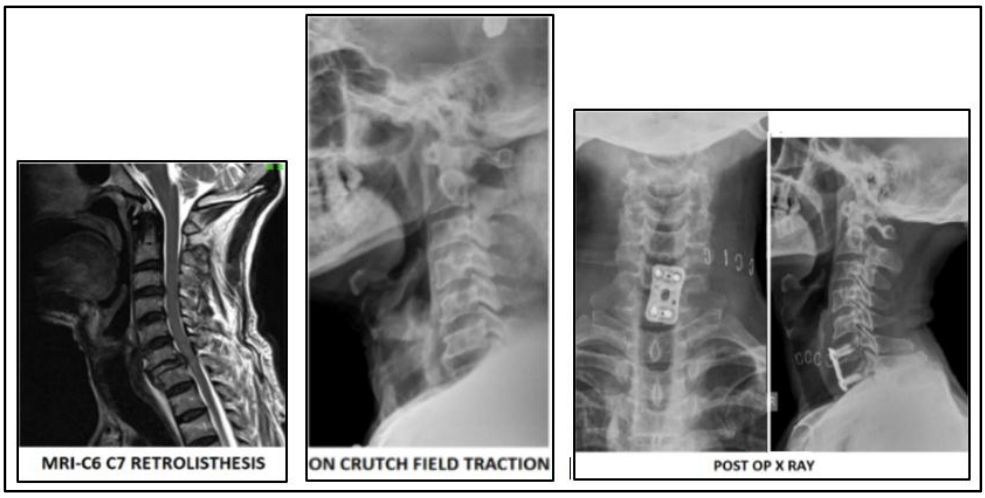

Figure 2. Cervical Spine injury managed with anterior decompression and plating and fusion

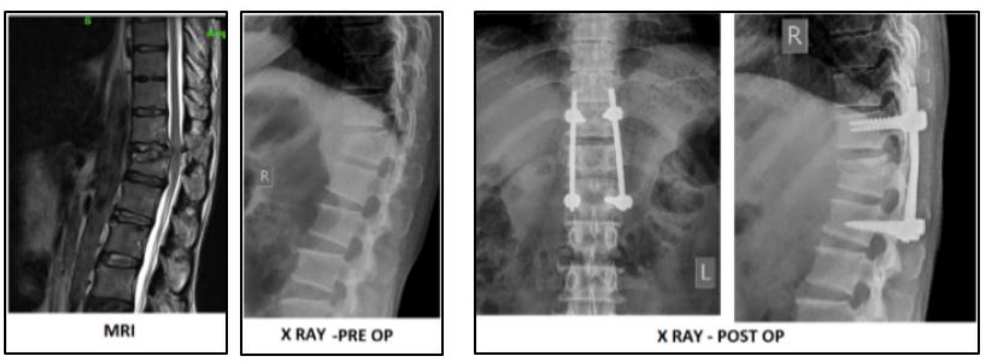

Figure 3. D12 Wedge Compression Fracture with Neurological Deficit, Decompression and Fixation with Pedicle Screw

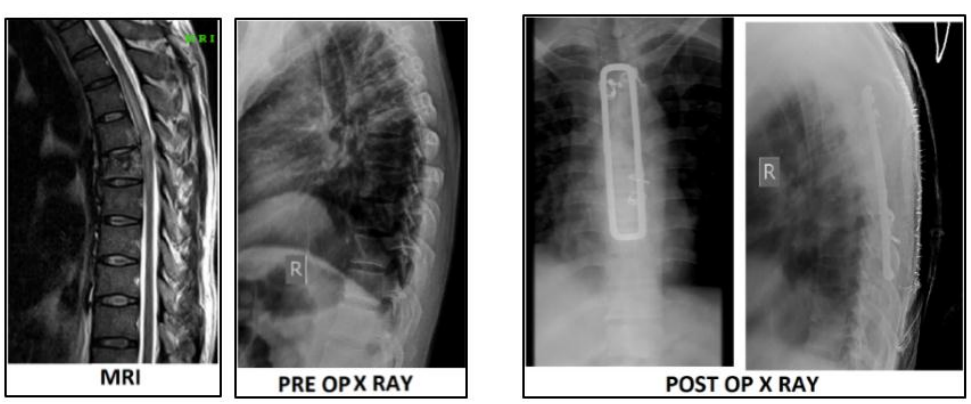

Figure 4. D6 Vertebral Fracture Decompression and Fixation with Hartshill Rectangle

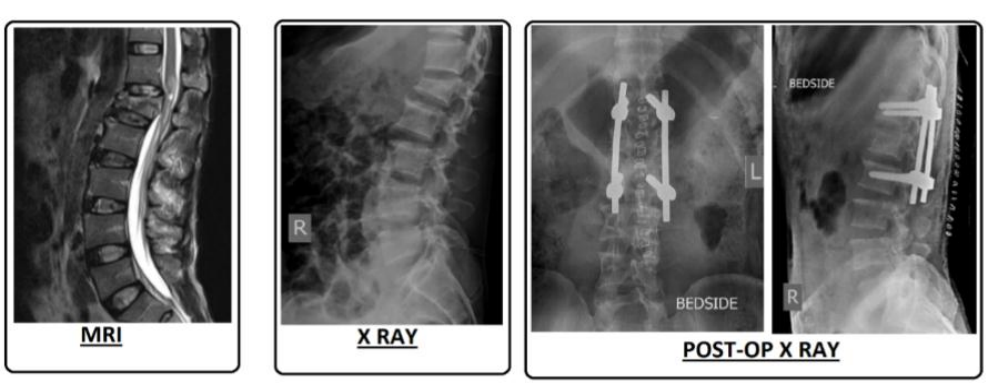

Figure 5. Burst Fracture of L2 Vertebra with Neurological Deficit – Decompression with Pedicle Screw Fixation

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