CLINICAL PROFILE OF TRAUMATIC CERVICAL SPINE INJURIES IN A TERTIARY CARE GOVERNMENT HOSPITAL IN SOUTH INDIA

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ABSTRACT

BACKGROUND

There is currently little reliable information regarding traumatic cervical spine injury patterns after trauma in India. This study was designed to accurately assess spectrum, and distribution of cervical spine injury after trauma.

METHODS

We enrolled all patients with traumatic cervical spine injuries presenting to the Dept. of Neurosurgery, GGH, Guntur, India. Injury status was determined by review of all radiographic studies obtained on each patient.

RESULTS

A total number of 88 patients with TCSI were studied during the stipulated time period of 2 years. The majority of injuries were due to RTA reaching 55 (64%). This was followed by 29 (32%) due to fall from height and 4% were due to assault injuries. 43 (48%) of the injuries were at C 5/6 level. In the postoperative period, there were no complications of graft retropulsion, telescoping of graft or implant migration.

CONCLUSION

Our study at a tertiary referral centre in a developing country shows that men between 30- 50 years are prone to TCSI due to RTA.

KEYWORDS

Spine Injury, Cervical Spine, Trauma, Neurosurgery.

HOW TO CITE THIS ARTICLE: Injeti BSK, Chanda SR, Kesanakurthi MVVS, et al. Clinical profile of traumatic cervical spine injuries in a tertiary care government hospital in South India. J. Evid. Based Med. Healthc. 2016; 3(57), 2962-2964.

DOI: 10.18410/jebmh/2016/645

INTRODUCTION: Acute injuries of the spine are among the most common causes of death and disability resulting from trauma. Worldwide, the most common cause of spinal trauma is road traffic accidents. Across the globe, an estimated 1.2 million people succumb to road crashes each year and as many as 50 million are injured.[1]

The economic cost of road traffic accidents and injuries is estimated to be 1% of GNP (gross national product) in low income countries, 1.5% in middle income countries and 2% in high income countries. The global cost is US $518 billion per year. A comprehensive study found that road traffic injuries accounted for 30-86% of trauma admissions in low and middle income countries.[2] Road traffic injuries accounted for 13-31% of all injury-related attendees and 48% of bed occupancy in surgical wards.[1]

Financial or Other, Competing Interest: None.
Submission 29-06-2016, Peer Review 07-07-2016,
Acceptance 11-07-2016, Published 16-07-2016.
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DOI: 10.18410/jebmh/2016/645

These patients were the most frequent users of operating theatres and intensive care units. The increased work load in radiology and increased demand for physiotherapy and rehabilitation services were largely attributed to trauma.[1]

Spinal trauma following road traffic accidents contribute to high mortality and morbidity. These injuries are severe, require dedicated surgical care and prolonged rehabilitation. These injuries often result in permanent para or quadriplegia and render the victims disabled for life. The patients remain helplessly dependent and despondent for the rest of their lives. The study of the patterns and outcomes of these injuries is necessary for planning and implementing productive and innovative programs for these patients. Western studies contribute to the knowledge of spinal trauma to large extent.

Accurate data regarding the clinical profile and outcome of spinal injuries especially that of the cervical spinal injury is lacking from developing countries. We present our data of surgical management of traumatic subaxial cervical spine injury in a Govt. tertiary care centre from the heart of South India.

MATERIALS AND METHODS: A total of 88 surgically managed patients who had presented to the Neurosurgery Department of the Govt. General hospital, Guntur, India with traumatic quadriplegia were included in the study. Clinicodemographic data was recorded for all the patients included in the study. A detailed history and clinical examination was performed on all the patients as per hospital protocol.

All the spinal injury patients with a history of trauma were admitted and evaluated with appropriate views of plain x-ray views as initial screening and subsequently evaluated in detail with MRI-spine with various reconstruction views. Those patients with suspected axial spine injury and locked facets were further evaluated with cervical spine CT scan.

After evaluating and confirming the cervical spine injury, with relevant investigations, consent for surgery was obtained from the patient and relatives (written consent was obtained from the relatives in most cases as patients could not use their hands).

We used the ASIA grading system for assessment of spinal cord injury. We tested the key muscles for assessment of power in upper and lower limbs, the pain and vibration sense for sensory system and the bladder sensation and sacral sensations for evaluation of complete and incompleteness of cord injury.

The inclusion criteria for surgery were:

1. Either complete or incomplete cervical cord injuries.
2. All types of subaxial cervical injuries.
3. Ligamentous injuries with instability and cord oedema.
4. Traumatic quadriplegic patients.
5. Cervical spine injury with head injury with GCS 15/15.
6. Cervical spine injury with extremities injuries.

The exclusion criteria were:

1. Pathological fracture of cervical spine injuries including infective, metabolic, degenerative and metastatic deposits.
2. Active DVT cases.

Eligible patients were further evaluated radiologically in detail for the pathology of the fracture and the status of the cord like oedema or contusion, with attention to the facet locking status, anterior and posterior columns.

A detailed study of subluxation and facet locking was done with anteroposterior, lateral, flexion and extension x-rays. Those patients who showed subluxation were subjected to closed reduction by applying skull traction with tongs (Crutchfield's skull traction) preoperatively. In patients with locked facets, cervical CT scan was done with axial, coronal and sagittal reconstructions.

Anterior cervical discectomy was performed as per standard international protocol. Patients were subjected to inline traction with oral endotracheal tube intubation with minimal neck manipulation. Right-sided approach with vertical skin incision was followed. In all discectomies and corpectomies, fusion was done with iliac crest bone graft regularly.

We used standard hardware system for stabilisation for both anterior and posterior stabilisation. We performed anterior cervical discectomy followed by plate osteosynthesis and polyaxial lateral mass screws and rods for posterior stabilisation.

All patients with subaxial spine injury which could be reduced were subjected to anterior cervical approach - 85 (96%); and those patients who had irreducible locked facets - 3 (4%) were subjected to posterior approach using lateral mass screws and rods.

All patients were made to sit with support in graded manner taking care of postural hypotension. Physiotherapy of upper and lower limbs along with chest was continued. Only 6% patients were on preop ventilator support. This support was continued postop with tracheostomy. Bedsores were managed by frequent postural changes, and dry dressings. Bladder care was by continuous bladder drainage by Foley catheter and frequent changing of bladder catheter as and when necessary followed by bladder training.

All patients were discharged at the end of 8th POD after ruling out all immediate postoperative complications. Patients were discharged with physiotherapy advice. Patients were kept on regular followup for every three weeks for the initial 2 months, later for every 2 months. In the postop course, patient was evaluated clinically and radiologically with x-ray cervical spine lateral views to rule out graft complications like retropulsion, expulsion, telescoping of graft, pseudoarthrosis and implant failure.

The study was conducted with the approval of the ethics committee at Guntur Medical College and Government General Hospital, Guntur, Andhra Pradesh from Sept 2013-Sept 2015.

RESULTS: A total number of 88 patients with TCSI were studied during the stipulated time period of 2 years. Out of 88, 78 (88%) were male and 10 (11%) were female (Fig 1). Patients ranged from 31 to 40 years. The majority of injuries were due to RTA reaching 55 (64%). This was followed by 29 (32%) due to fall from height and 4% were due to assault injuries Fig. 2.

27 patients (30%) presented with grade B injury, 12 patients (13%) grade C injury and remaining patients belonged to grade D injury. Most of the patients presented after 8 hours after injury. 12 (18%) had superficial bed sores at the time of admission. On radiological evaluation, all patients had a subluxation component in addition to varying degree of flexion, extension, and rotation components.

43 (48%) of the injuries were at C5-6 level. The least number of injuries were at C3-4 level - 5 (5%). Other sites of injuries included were as follows C6-7 level - 19 (21%) and C4-5 level - 21 (23%). Average time taken for patients to undergo surgery was 8 days. In our study, 13 (14%) underwent corpectomy.

In the postoperative period, cervical immobilisation was continued with hard cervical and Philadelphia cervical collar irrespective of approach. 20 (22%) patients suffered from bedsores. Among these, 12 (13%) had bedsores preoperatively which did not progress in the postoperative

period. 8 (9%) developed superficial bed sores postoperatively. All the bed sores developed in the sacral region. There were no choking episodes. None of patients developed tracheoesophageal complications. There was 1 case (0.1%) of wound infection.

In the postoperative period, cervical collar was continued for 6-12 weeks in addition to physiotherapy. There were no complications of graft retropulsion, telescoping of graft or implant migration. There was one case of implant infection. Fusion was assessed by plain x-ray cervical spine lateral view after three months. There was no pseudoarthrosis at the fusion site. 69 patients were in 6-month followup, 31 cases had postop improvement of two grades during the followup period. 18 cases had improvement of one grade and 13 cases had no improvement.

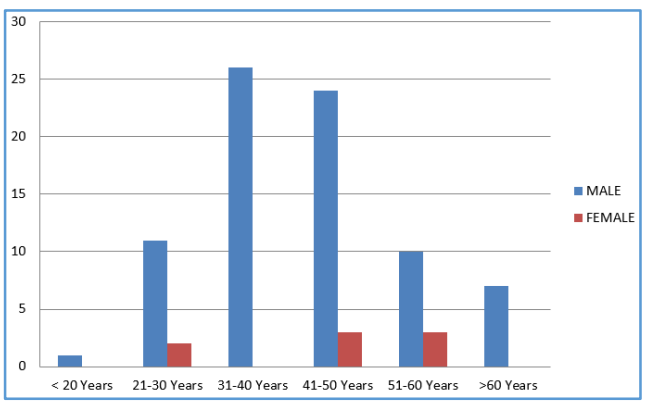

Fig. 1: Age Distribution

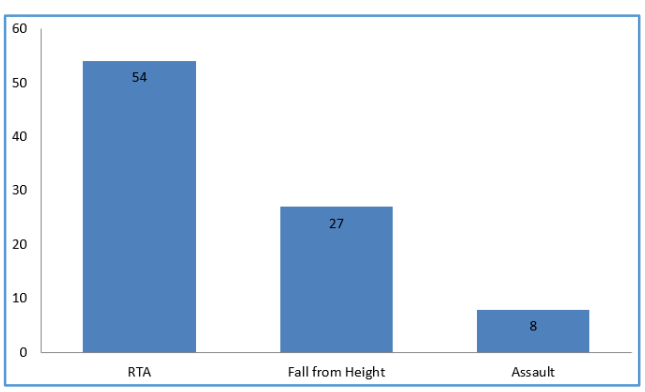

Fig. 2: Various modes of Injuries

Invariably, all patients with cervical spine injuries were subjected to MRI Spine with screening of whole spine and corresponding axial sections of the cervical region. This helped in detail study of extension of cord oedema and contusion, especially its proximal extent.

DISCUSSION: In our study, 31-40 years age group were most commonly affected with TCSI. Segum T Dawodu et al study on spinal cord injury reported that more than 50% of all cases of SCI occurred in persons aged 16-30 and the median age in their study was 26.4 years.[3]

In our case, in the 20-40 years age patients, motor vehicle accidents were most common cause of injury. Compared to the worldwide data of a 13-31% contribution of RTAs to cervical injuries, our study reports a higher proportion (64%).

The male to female ratio of individual with SCI in the United States is 4:1 and male constitutes 80% of persons with SCI. In our study also 88% of patients were men. In our study, most of the patients with spine trauma were evaluated partially at peripheral centres and later were referred to our institute.

In this study, C5-6 level was the most commonly affected region with 48% which correlates with the study done by Torretti J A, Sengupta D K et al.[4]

Segum T Dawodu et al study[3] found that SCIs are most commonly due to motor vehicle accidents accounting of 44.5%, falls 18.1%, violence 16.6%, sports injuries 12.7%. In our study, motor vehicle accidents topped with 64%, followed by fall from height 32% and assaults 4%.

CONCLUSION: Our study at a tertiary referral centre in a developing country shows that men between 30-50 years are prone to TCSI due to RTA. There was a neurological recovery by one or two grades by surgical management in most of the patients.

ACKNOWLEDGEMENTS: We thank Mr Samson Gangolu, clerical offices during manuscript preparation.

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