A Prospective Study Of Spinal Cord Injury In The University Of Calabar Teaching Hospital, Calabar, Nigeria: A Preliminary Report

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Abstract

Background: Spinal Cord Injury (SCI) is still a major cause of morbidity and mortality in our environment. It posses a management challenge to the Orthopaedic surgeons in an environment of scarce manpower and specialized facilities.

Aim: To establish the pattern of SCI in Calabar and contribute to the existing national data on this injury as well as highlighting the deficiencies in our peculiar environment with a view to improving them.

Methods: A prospective research protocol by questionnaire was designed for all patients presenting with spinal cord injury at the University of Calabar Teaching between February 2005 and January 2006. The parameters of study included patients' demographics, mode and pattern of injuries, neurologic grade pre and post treatment, complications and clinical outcome.

Results: Fourteen spinal cord injured patients were admitted during the study period. Mean age was 36years with a male/female ratio of 4:1. Motor vehicle accidents were the most common cause 12 (85.7%). Thirteen (93%) patients were transported to the hospital by bus/car while one patient was brought on a motor cycle. None of the victims of road traffic accident wore protective device nor had any proper pre-hospital care. The commonest site of injury was the lumbar region 6 (43%) while cervical and thoracic regions contributed 5 (35.7%) and 3(21.4%) respectively. Clinical presentation were; paraplegia 11 (78.6%), quadriplegia 2 (14.3%) and spinal shock 1 (7%). Treatment included cast/braces support, drugs and Physiotherapy. Associated injuries included limb factures-4, head injuries-1, rib fractures-1, Splenic-1, bowel injuries-1 and soft tissue lacerations in 2 patients. Mean interval between injury and presentation at hospital was 2 days (2hrs-30days) while the duration of stay in hospital ranged between 4 to 20 weeks. Mortality was 2 (14.3%)

Conclusion: Public enlightenment on road safety measures and use of proper protective devices including seat belts and helmet could reduce the high morbidity associated with Spinal cord injuries. More spinal centres and training of more trauma/neurosurgeons are needed.

INTRODUCTION

Spinal cord trauma is damage to the spinal cord that eventually affects every system of the body. Good outcome depends on prompt and effective care from moment of injury and throughout the life of the paralyzed person. In the developing world there is still a high morbidity and mortality rate as a result of inadequate facility and care.[1,2,3] The commonest cause globally is motor vehicular accidents. Incidence varies from country to country in the range of 10 to 50% per million population per annum. The actual incidence is still difficult to assess in our environment since majority of the victims die before reaching hospital. The most challenging of all spinal injuries is the tetraplegic who often constitutes the bulk of mortality.[1,2] Early diagnosis, immobilization, preservation or restoration of spinal cord function, and stabilization are the keys to successful management of these injuries. Most injuries occur to young and active persons in their adolescence or early adulthood.[3,4,5]

We undertook this study in a prospective design in order to establish the actual incidence and pattern of presentation in our institution and to highlight the management challenges

in an environment where most facilities for management of spinal cord injuries are lacking. This is an ongoing study and this communication is the preliminary report of the first 12 months of the study.

PATIENTS AND METHOD

This study is a component part of the wider prospective study of trauma by the University of Calabar Teaching Hospital Trauma Research Group headed by Professor O.O.Bassey

A prospective research proforma was designed for all patients presenting with spinal cord injury at the University of Calabar Teaching between February 2005 and January 2006.This study was approved by the ethical committee of the hospital. The parameters of study included demography, mechanism and pattern of injuries, pattern and outcome of management, complications and follow-up findings among other things. Most patients in this study arrived late but those who came in within the first 24hours were given intravenous dexamethasone. The patients had appropriate radiographic and haematological investigations and were treated conservatively. This included the use of cast support, braces, drugs, intensive nursing care and physiotherapy. Three patients were referred to specialized centres in Nigeria. The data were analyzed using simple manual methods. The outcome of treatment was assessed using Frankel clinical criteria. Computerized tomography (CT) scan and Magnetic resonance imaging (MRI) were not available in this centre. The centre does not have an established neurosurgical unit; all spinal cord injuries are managed by the Orthopaedic and Trauma unit of the hospital.

RESULTS

A total of 2129 emergencies were seen at the Accident and Emergency Department of the University of Calabar Teaching hospital during the study period. Out of this, 649 (30.5%) were caused by trauma. Fourteen (2.15%) of the trauma patients had spinal cord injuries. Their age range was between 21 and 60 years. Nine patients (64%) were in the 21-30 years age bracket while 5 (36%) aged between 31 and 60 years. Male: Female ratio was 4:1. One public servant, 2 students, 5 labourers and 6 motor cyclists were involved. Labourers and cyclists constituted about 79%.

Thirteen (93%) patients were transported to the hospital by bus/car while one patient was brought on a motor cycle. None of the victims of road traffic accident wore protective devices such as seat belt and protective helmet and none had any pre-hospital care. Road traffic accident (RTA) accounted for 12 (85.7%) of the injuries. Of these 7 (50%) were caused by motor vehicles while 5 (35.7%) were from motorcycles. The commonest site of injury (43%) was the lumbar region (Table 1). Clinical presentation were; paraplegia -11 (78.6%), quadriplegia- 2 (14.3%) and spinal shock- 1 (7%). All the quadriplegics and eight of the paraplegic patients had clinically complete injury (Frankel A) on admission. Three patients (21.4%) had incomplete cord injury (Frankel C) while one patient had only spinal shock. All except one patient had Glasgow coma scale of 10 and above. The duration of stay in hospital ranged between 4 to 30 weeks. Twelve patient (85.7%) had complications ranging from bed sores in 4 patient (29%), paralytic ileus 2 (14.3%), hyperpyrexia 1 (7%), urinary tract infections 3 (21.4%), respiratory difficulty in 1 patient (7%) and loss of sexual function (male impotence) in 1 (7%). Among the Frankel A group, two (14.3%) patients died. This mortality of 14.3% was recorded in patients who also had severe head trauma and high cervical spinal cord injury respectively. All the three patients (21.4%) with incomplete injuries and the one with spinal shock had full recovery of movement and sensation within 12 weeks while 57% were still paraplegic at time of discharge (about 6 Months).

Figure 1

Figure 1: Causes Of Injury

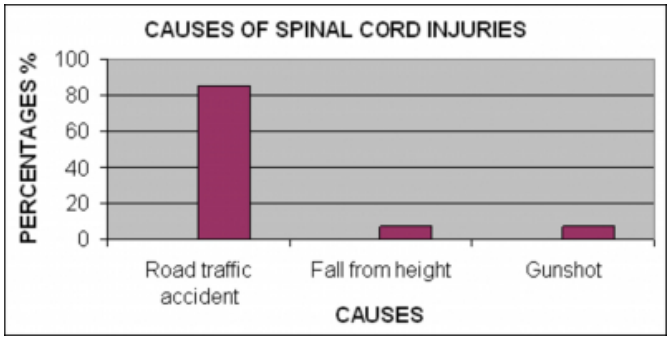


Figure 2

Table 1: Site of Injury and type

Site	Type	Number	%
Lumbar	Blunt	6	43
Cervical	Blunt	5	35.7
Thoracic :-	Blunt	2	
	Penetrating	1	21.4
	Total	14	100

Figure 3

Table 2 A: Interval between Injury and Treatment

Injury--Treatment interval	Number	%
1Hr to 1 day	9	64.3
2 days to 1week	3	21.4
2 wks to 1 month	1	7.1
Beyond 1month	1	7.1
Total	**14**	**100**

Figure 4

Table 2 B: Place of Initial Treatment

Place of Initial Treatment	Number	%
Hospital	9	64.3
Home	4	28.6
Traditional bone centre	1	7.1
Total	**14**	**100**

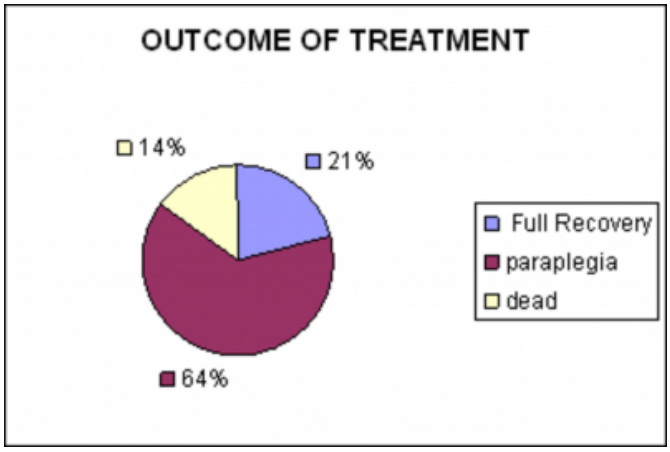
Figure 5

Table 3: Associated Injuries

Assoc. Injury	Number	Treatment
Limb fractures	4	Cast application
Head injury	1	Drugs/Nursing
Ribs Fracture	1	Chest exercise/Drugs
Splenic rupture	1	Laparotmy/splenectomy
Bowel injury	1	Laparotomy/Repair
Soft tissue lacerations	2	Suture/Wound care
None	4	---

Figure 6

Figure 2: Outcome of treatment.



DISCUSSION

Spinal cord injury is an emergency requiring immediate treatment to reduce the long-term effects. The time between the injury and treatment is a critical factor affecting the eventual outcome.[3,6,7] The interval between injury and treatment aggress with other reports from Nigeria. These ranges between 2 and 10 days.[1,2,3,4] In this series one patient reported after three weeks of treatment at the traditional bone centre. Late presentation, lack of prehospital care and specialized facilities account for poor result in this region.[5]

Road traffic accident was the commonest aetiology in this study (85%) and similar findings are reported from Maiduguri, Gombe in Nigeria and other centres worldwide which contrasts with reports from Enugu where falls from height was the major cause.[4,6,8] Other major causes include diving into shallow water, football/athletic injuries, falling objects, or fired projectiles.[9,10,11], A notable feature in the study was the predominance of motorcyclists and young ages of the victims (21-30yrs). Studies have shown that

traumatic cervical spine injuries are common in adults in their sixth and seventh decades because of pre-existing spondylosis but this was not our experience.[9,10]

The only available specific investigation for skeletal injuries in our centre is plain radiograph. Computed Tomography scan (CT) or Magnetic Resonance Imaging (MRI) which may pinpoint the location and extent of spinal cord trauma and demonstrate any compressive lesions are lacking in most centres in the sub region.[12]Diagnosis in our centre is mainly clinical. Somatosensory evoked potential (SSEP) testing or magnetic stimulation are also not available.

Paralysis and loss of sensation of part of the body were common presentations of this injury. This ranges from total paralysis or numbness and varying degrees of movement or sensation loss. The level of injury affects the outcome. Cervical injuries result in more extensive disability (numbness and paralysis, breathing difficulty) than injuries in the lumbar region.[6,7,13]Complete high cervical transection usually results in death possibly due to paralysis of the respiratory muscles and hyperpyrexia.[1]

Fourteen percent mortality recorded in this series was due to high cervical spine injuries. The mortality for cervical spine injuries may be as high as 40%.[15]Most cervical spine injuries are associated with head injuries and vice versa. In our study, only one patient had associated head injury with cervical spinal injury. Plain radiographs of the spine are therefore mandatory in patients with severe head injury and vice versa.[7,12]Thoracic and or lumbar spine injuries cause incomplete spinal cord injuries. In this study lumbar spine injury accounted for the highest number of injury (43%), this may point to the fact that most patients with high spinal lesions die on the spot or in transit to the hospital because of improper transportation and handling.The therapeutic goals are to preserve life, maintain or restore neurologic function, provide stabilization of the spine, and allow optimal rehabilitation.[14,16,18,19] The formation of spinal cord injury centers has improved emergency care in developed countries and should be adopted in our country. A team approach is also important to obtain optimal results. In less ideal hospital settings where man-power and skilled members of the spinal cord injury treatment team are lacking, Katchy et al in Enugu recommend a 12-week training regimen where family members are involved. This allows the spinal cord injured to get expert treatment within a reasonable time.[16,17]

The effect of steroid could not be proven in this study. However, corticosteroids are useful in reducing swelling that may damage the spinal cord but must be given within 8 hours of injury to have any beneficial effect.[7,19]It is also noted that patients treated with high-dose steroids may be exposed to an increased infection rate and risk of gastrointestinal hemorrhage.[16]There is a high rate of missed spinal cord injuries in the unconscious and multiply injured patients.[7,20]A high index of suspicion is therefore required in the management of this category of trauma patients. In the absence of modern gadget, recovery of patients was done by clinical review of motor and sensory levels.

The commonest complications encountered were urinary tract infections (UTI) and bedsores. These are the common findings among researchers in Nigeria.[8,11,16,17] The 14% mortality occurred in patients with complete cervical spine lesion within the first 10 days. It is a documented fact that neurologic losses that remain after 6 months are more likely to be permanent.[7,16]This was the case with 64% of patients in our series.

CONCLUSION

Public enlightenment on road safety measures could reduce the high morbidity associated with spinal cord injuries. Use of proper protective devices including seat belts and helmet should be made compulsory to all cyclists and passengers. There is an urgent need to establish and equip regional spinal Centres to cater for the growing population. Regional ambulance services should be encouraged.[2,3,14,16]The National Health Insurance Scheme should be designed to touch rural dwellers. The conclusions of this ongoing research would be of immense benefit to Africans. We recommend that a multi-centre and multinational study be instituted in this regard.

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