Original Article

Cervical Spine Injury in Children with Head Injury in Ibadan, Nigeria

Adeolu AA*, Shokunbi MT, Malomo AO, Komolafe EO*, Adeleye A F
Division of Neurosurgery, Department of Surgery,
University College Hospital, Ibadan, Nigeria

Abstract

Background and Objective: This study was designed to evaluate the incidence and pattern of cervical spine injury in children with head injuries at University College Hospital, (UCH), Ibadan in Nigeria.

Patients and Methods: All patients below 15 years of age who presented with head injury in the accident and emergency room of UCH during the study period were included in the study. Diagnosis of head and cervical spine injuries were both clinical and radiological. Anteroposterior and lateral views of the cervical spine were obtained in all patients. Open mouth views were obtained in patients who could obey command. The presence of cervical spine fractures, subluxation or dislocation was considered as confirmation of cervical spine injury.

Results: There were 34 children with head injuries. Nineteen patients (55.9%) had mild head injuries and 20.6% had severe head injuries. The highest incidence (76.5%) occurred between 2 and 10 years of age. Falls were the most common cause with an incidence of 44.5%. This was closely followed by pedestrian motor vehicular crashes (35.3%). Only two (5.9%) patients showed evidence of cervical spine injuries on x-rays. Both patients had C6/C7 anterior subluxation. There were no patients with spinal cord injuries.

Conclusion: The incidence of cervical spine injury in our patients with head injury was low and it occurred mainly in the lower cervical spine region. Further studies with larger population will be needed to confirm our findings.

Key words: Cervical spine injury, head injury, children, fall.

Introduction

The close anatomical relationship between the head and the cervical spine may result in combined injuries to these structures. Twenty nine patients (58%) with spinal injuries in the series of Dietrich et al had head injuries[1]. Also, 37% of the children with spinal injuries in Cirak et al series had head injury[2]. However, the incidence of cervical injury in head injured children is much lower; values as low as 1.7% have been reported by some authors[3]. Even though the injuries are uncommon, the morbidity and mortality that may be associated with the injuries in children call for concern in young, growing individuals[4,5].

The growing nature of the bony spine in children poses a challenge in the radiologic diagnosis of cervical spine injuries. Thus, a high index of suspicion is needed if these injuries will not be missed.

This study determined the incidence of cervical spine injury (CSI) in children with head injury and to evaluate the pattern of CSI in children with head Injury in our centre.

Methodology

All patients below 15 years of age who

Correspondence: A A Adeolu, Division of Neurosurgery, Department of Surgery, College of Health Sciences, Ile-Ife, Ogun State, Nigeria. E-mail:adeoluaa@yahoo.com

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presented with head injury in the accident and emergency room of University College Hospital, (UCH), Ibadan, during the study period from July to December 1999 were prospectively studied.

Clinical evidence of head injury was based on history of trauma with the following occurring singly or in combination: altered level of consciousness in the absence of any other cause, scalp injuries, skull fractures including skull base, raised intracranial pressure in the absence of any other cause, intracranial space occupying lesion attributable to trauma and focal or lateralizing neurological signs in the absence of any other cause. Cranial computerized tomographic scan were performed as indicated. Presence of neck pain and/or midline posterior nuchal tenderness was suggestive of cervical spine injuries. Sensory or/and motor deficits in the limbs and/or trunk were used as indicators of spinal cord injuries. Cervical spine fractures, subluxation or dislocation on plain cervical x-rays (anteroposterior, lateral, open mouth views) were considered as confirmation of cervical spine injury. We obtained and analyzed information on patients' demography, mechanisms, type and level of injury.

Results

There were 34 patients with head injuries over the study period. There were 19 males and 15 females. The age range was 1-13 years with a mean of 6.8 years (±3.4). Table 1 gives the age distribution of the patients. Most of the patients (44.1%) were in the 60-120 months age range.

Table 1:
Age Distribution of the patients

Age Group (Months)	Frequency (%)
0-12	1(2.9)
13-60	11(32.4)
61-120	5(44.1)
121-180	7(20.6)
Total	43(100)

Table 2:
Severity of Head Injury

Severity of Head Injury (GCS)	Frequency (%)
Mild (15-13	19(55.9)
Moderate (12-9)	8(23.5)
Severe (8-3)	7(20.6)
Total	34(100)

Table 3:
Aetiology of Injury for each age group

Age group (Months)	Fall	Passenger MVA	Pedestrian MVA	Total
0-12	-	1	-	1
13-60	5	2	4	11
61-120	7	3	5	15
121-180	3	1	3	7
Total	15	7	12	34

Table 2 shows the severity of the head injury using the Glasgow coma scale. Sixty per cent of the children sustained mild head injury and about 21% had severe head injury.

Fall (44%) and pedestrian motor vehicular crashes (MVC) (35%) were the most common causes of the injuries. Passenger MVC accounted for 21%. Table 3 shows further information on the aetiology.

Only two patients (5.9%) had cervical spine injury. Both patients had mild head injury. They were aged 2 years (male) and 7 years (female). Fall was the cause of the injury in both patients. The injuries were C6/C7 anterior subluxation.

Discussion

The causes of head injury in our patients were similar to findings in other reports[6,7]. However, there was high incidence of fall and pedestrian MVC in

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our series. This may suggest negligence and lack of supervision of the under-aged by responsible adults in our environment; a situation that calls for concern. The pattern also shows that sport as a cause of childhood neurotrauma is not common in our environment compared to other parts of the world[2].

The injuries in the two patients with cervical spine injury occurred in the lower cervical region. This is different from other findings that show that cervical spine injuries in children with head injuries are more common in the upper cervical region[2]. The mechanism of injuries to the head and spine in such cases are probably the same, a fact that is supported by high incidence of fracture of the base of the skull in this group of patients[8].

The low incidence of cervical spine injury in our children with head injury also supports previous findings that cervical spine injury is not as common in head injury compared to high frequency of head injury in patients with cervical spine injury[1-3,8].

The evidence for the association of head injury and cervical spine injury in children suggests that cervical spine injury should be suspected in children with head injury as in adult population. Malomo et al had earlier suggested that cervical spine injury is not common in children below 10 years of age with head injury[9]. The ages of our patients with cervical spine injury would suggest otherwise.

Although the immaturity of the bones in children could make interpretation of plain radiographs less accurate, the diagnostic yield of routine plain x-ray has been found to be high even in children less than 5 years. Hernandez, Chupik and Swischuk found that all their patients with CT changes in the spine had evidence of similar abnormalities on the plain radiographs suggesting that there were no additional benefits of CT in the patients[10]. Flexion and extension study under fluoroscopy with somatosensory evoked potential monitoring may also be helpful but facilities for these are not always available especially in the developing countries[11].

The incidence of cervical spine injury in our patients with head injury in this study was 5.9 %. The injury occurred mainly in the lower cervical region unlike in previous studies. Further study with larger population size is needed to confirm our findings.

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