ORIGINAL ARTICLE

Frequency of Neurosurgical Lesions in Patients with Minor Traumatic Head Injuries

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ABSTRACT

Objective: *To observe the characteristics of minor head injuries (HI) receiving treatment at our Neurosurgery Department and their evolution in the short term.*

Materials and Methods: *Study included patients over the age of 14 who had sustained a minor HI, had a cranial CT scan and had been admitted for observation in the neurosurgery ward. Descriptive and retrospective analysis.*

Results: *A total of 114 patients were included in the study. 76% presented with Glasgow 15 and 78% were male. Brief loss of consciousness (70%) and amnesia (52%) were the two most frequent alertness clinical findings. Surgical lesions were (15%) depressed skull fractures, 8% had extradural hematomas, cerebral contusions in 5.2% and subdural hematomas in 1%.*

Conclusions: *As patients with minor traumatic brain injury have significant number of surgical lesion so Clinical guidelines must be set up for the treatment of patients with minor traumatic brain injury.*

Key words: *Head injury (HI), Glasgow coma scale (GCS), Intracranial lesions (ICL), Intracranial injury (ICI).*

INTRODUCTION

Head injuries (HI) are a usual reason for consultation in accident and emergency departments.[1,2] Head injury can be defined as any alteration in mental or physical functioning related to a blow to the head. Head injury is the most common cause of death among adults younger than 45 years and in children upto 15 years of age. The mechanical forces in head injured patient causes the head to undergoes sudden acceleration, deceleration or rotation,[3] leading to compression and shearing of neuronal and vascular tissue at the time of impact. A series of pathological events may further leads to brain injury. These secondary causes are amenable to intervention and may be worsened by physiological insults[4]. Traumatic head injury affects more than 1.7 million people in the United States each year including almost a half million children; 52,000 people die.[5]

Despite the frequency of the pathology, many diagnostic and action protocols are available.[6-8] Such differences in the management thereof become more pronounced as the case increases in complexity and depends on the normal practice of each hospital, access to diagnostic tests, physician opinion and family pressure.[8-10] The most frequent diagnostic dilemma facing the Accident and Emergency (A&E) department is minor HI, that is, injury resulting from a mechanism of lesser violence, with preservation of patient consciousness, with no neurological facilities and presenting, at the most, with minor neurological symptoms such as loss of consciousness , headache, GCS ranges from 13 – 15, vomiting, post-traumatic immediate convulsion or lethargy.[11,12] The risk of intracranial injury (ICI) in minor HI is not clear, but probably ranges from less than 1%, in a patient with a Glasgow scale of 15, 1% to 5% in a patient who has had a loss of consciousness, amnesia, vomiting or convulsions, although few of these ICIs require neurosurgical intervention.[7,8,10,11,12] The aim of this study was to observe the characteristics of the patients treated at our neurosurgery Department who have sustained a minor HI (Glasgow Coma Scale Score [GCS] 13 – 15), have had

brain CT scan and have been admitted for observation, the evolution thereof and possible immediate complications.

MATERIALS AND METHODS

Study Design

This retrospective study includes all Traumatic head injured patients over the age of 14 treated at the neurosurgery department of Ayub Teaching Hospital Abbottabad in the period between April 2010 and May 2011.

Inclusion Criteria

This is a tertiary care hospital which have 1000 beds and well established neurosurgical unit. The study included all patients with a GCS of 13 – 15 who had undergone a CT scan due to presentation of any of the following alertness symptoms: loss of consciousness, amnesia regarding episode, vomiting, scalp lesions, headache or dizziness.

Exclusion Criteria

Those presenting with a GCS < 13, or who had sustained severe Multiple injuries or neurosurgical pathology needing specialized care, were excluded from the study.

Data was obtained from data sheets reviewed in the retrospective analysis of emergency medical attention, clinical histories and radiological reports of the patients that met the inclusion criteria. Most were admitted in the neurosurgery unit. Demographic variables such as gender and age, personal history of oral anticoagulation medication, injury mechanism, GCS, associated symptoms, associated injuries, CT scan performed and result thereof, duration of stay and evolution of patients neurological status were recorded.

Statistical Analysis

The results of the **continuous variables** have been expressed as means and standard deviations when following a normal distribution, and **qualitative variables** as numbers and percentages. Data were analysed with the G-stat version 2.0 for Windows statistics program.

RESULTS

During the study period, 496 cases of head injury were considered, of which only those which met the inclusion criteria were finally selected: a total of 114 patients. The main reason for this such a selection was that most of the 496 cases involved grazes, wounds or bruises which did not require complementary tests or specific attention. Likewise, patients with a pathological CT scan needing initial neurosurgical evaluation and/or treatment were admitted in the neurosurgery ward and appropriate intervention has been done.

Sex Incidence

If we focus on our study population, the distribution by gender was 78% male and 22% female (Table 1).

Table 1: *Sex Incidence.*

Sex	No.	Percentage
Male		78
Female		22
Total	114	100

Mean age was 49 years (14 – 95). Only 3% were taking oral anticoagulant medication.

Etiology

The most frequent injury mechanisms leading to head injury (HI) were history of fall in 54% of patients, followed by road traffic accidents in 38%, work – related in 5% and assault in 3% (Table 2).

Table 2: *Percentages of the Etiology of Traumatic Brain Injuries.*

Etiology	Percentage
History of fall	54%
Road traffic accident	38%
Work related	5%
Assaults	3%

Clinical Features

Alertness clinical findings which led to the performance of CT brain scans, were amnesia in 52%, brief loss of consciousness in 70%, vomiting (> 2 occasions) in 8%, dizziness in 31%, headache in 63% and scalp lacerations in 26% of the cases.

Glasgow scale scores upon arrival at the A&E were: GCS 15 in 76%, GCS 14 in 14% and GCS 13 in 11% of patients. The most frequent lesion found on CT – Scan was depress skull fracture in 17 (15%) cases, extradural hematoma in 9 (8%) of cases, followed by cerebral contusions in 6 (5.2%) of cases, and subdural hematoma in 1 (1%) of cases (Table 3).

Outcome

Seventeen patients underwent surgery for depress skull fracture and extradural hematoma. All had a good recovery.

Table 3: *Percentages of Lesions on CT – Scan Brain.*

Types of Lesion on CT – Scan	No.	Percentage
Depress skull fracture	17	15%
Extradural hematoma	9	8%
Cerebral contusions	6	5.2%
Subdural hematoma	1	1%

The mean length of stay of the patients in the neurosurgery ward was 1.6 days (range 1 – 7); only 3% of the cases made a second visit to A&E after having been discharged, with headache and/or vertigo being the only causes for such a visit. All cases had routine OPD follow up once after 7 – 10 days.

DISCUSSION

We observed that a total of 496 cases of HI were treated during the study period, which representing 1% of the total A&E visits per year. These we selected only 114 cases which met the aforementioned inclusion criteria of our study. The higher number of males treated for this cause, 78% v. 22% of females, is worthy of note. This may be due to the fact that most of the head injuries pertain to casual, sports or occupational accidents, aspects in which males have a statistically higher presence. Despite amnesia and loss of consciousness being alarming symptoms present in more than 50% of the patients, these clearly indicates to have an urgent CT-Scan brain of the patient to exclude any pathology which needs surgical intervention, as our study showed that 29.2% of patients with minor Traumatic Head Injury had surgical lesions like depressed skull fracture, extradural haematoma, cerebral contusions and subdural haematoma. This study supports the hypothesis that whenever there is any indication of CT – Scan like loss of consciousness, post traumatic amnesia, fits, vomiting or GCS 13 or less then 13, immediately CT-Scan should be done and treat the patients accordingly to decrease the mortality and morbidity from traumatic brain injuries. The length of the hospital stay depended, in most cases, on associated injuries sustained by the patients admitted into the neurosurgery ward. These largely required IV analgesic control and, to a lesser degree, specific dressings or surgical treatment. It is important to mention the high number of follow-up CT scans (15) which were performed in hospitalized patients, almost all of which were normal. The main reason for the CT scan request was the appearance of vertigo resistant to dosage medication or headache not relieved by minor analgesics. Request for a brain CT scan was only justified in 2 of the 15 cases due to the worsening of GCS. As we have already mentioned, such CT scans showed intracranial pathology.

CONCLUSIONS

From the data provided by this study we are able to conclude that clinical guidelines should be developed for the management of minor Head injury as well as the use of clinical scales when requesting a CT scan,[13-16] by keeping in mind, the high probability of pathological clinical findings in such cases.

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