



Original Article

Analysis of minor head injuries treated in an Accident & Emergency Department

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ABSTRACT

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

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 Short Stay Unit (SSU). Descriptive and retrospective analysis.

Results: A total of 172 patients were included in the study. 91% presented with Glasgow 15 and 71% were male. Brief loss of consciousness (70%) and amnesia (52%) were the two most frequent alertness clinical findings. The CT scans were normal in 88% of the patients. Only 2 patients admitted for observations needed to be referred to a neurosurgical centre.

Conclusions: Clinical guidelines must be set up for the treatment of minor HI. SSUs are an adequate location for the treatment of minor HI in the absence of a neurosurgical department.

Key Words: Minor HI. Short Stay Unit. Accident and Emergency Department.

RESUMEN

Análisis de los traumatismos craneoencefálicos leves atendidos en un Servicio de Urgencias

Objectivo: conocer las características de los traumatismos craneoencefálicos (TCE) leves atendidos en nuestro Servicio de Urgencias y su evolución a corto plazo.

Métodos: Se incluyeron pacientes mayores de 14 años que habían sufrido un TCE leve a los que se les realizó TC craneal y que permanecieron ingresados en observación en la Unidad de Corta Estancia (UCE). Análisis descriptivo y retrospectivo.

Resultados: Un total de 172 pacientes fueron incluidos en el estudio. El 91% presentaban un Glasgow 15 y el 71% fueron varones. La pérdida de conocimiento breve (70%) y la amnesia (52%) fueron los dos hallazgos clínicos de alerta más frecuentes. La TC craneal fue normal en el 88% de los pacientes. Sólo 2 de los pacientes ingresados en observación necesitaron derivación a un centro neuroquirúrgico.

Conclusiones: Es necesario la implementación de las vías clínicas para el abordaje de los TCE leves. Las UCE constituyen una ubicación adecuada para la atención del TCE leve en los hospitales que carecen de neurocirugía.

Palabras clave: TCE leve. Unidad de Corta Estancia. Servicio de Urgencias.

INTRODUCTION

Head injuries (HI) are a usual reason for consultation in accident and emergency departments of in Spain^{1,2}. Patients evolution, as a rule, is satisfactory, although this cause gives rise to numerous hospital admissions, at a high social and economic cost and unnecessary exposure of patients to radiation in many cases^{1,3,4}.

Despite the frequency of the pathology, many diagnostic

and action protocols are available⁵⁻⁷. 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 pressure⁷⁻⁹.

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

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focalities nor evidence of fracture and presenting, at the most, with minor neurological symptoms such as loss of consciousness for less than one minute, headache, isolated vomiting, post-traumatic immediate convulsion or lethargy^{10,11}. 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 very few of these ICIs require neurosurgical intervention^{6,7,9-11}.

The aim of this study was to observe the characteristics of the patients treated at our A&E 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.

METHODS

Study design

This retrospective study includes all HI patients over the age of 14 treated at the A&E Department of the San Millán-San Pedro Hospital of Logroño (Spain) in the period between February 2004 and February 2005. This is a primary health care hospital serving a population of 245,324, whose A&E department attended a total of 95,310 patients in 2004, with an average of 261 emergencies per day. Our hospital lacks a neurosurgical department and must refer such patients to a centre assigned for this purpose: the University Clinical Hospital of Zaragoza (180 km. away).

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. 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 Short Stay Unit (SSU) attached to the A&E department (which is the main subject of discussion herein).

Demographic variables such as gender and age, personal history of oral anticoagulation medication, injury mechanism, GCS, associated symptoms, associated injuries, CT scan performed (if any) and result thereof, duration of stay and evolution

within the SSU, second visit to A&E and need for a follow-up CT scan.

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, 1,694 HI cases were considered, of which only those which met the inclusion criteria were finally selected: a total of 172 patients (Table 1). The main reason for this such a selection was that most of the 1,694 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 also excluded, since there is no neurosurgical department in the San Millán Hospital and thus fell outside the scope of the Short Stay Observation Units (SSOUs).

If we focus on our study population, the distribution by gender was 71% male and 29% female, with a mean age of 49 years (14-95). Only 3% were taking oral anticoagulant medication and in 6% of the 4 cases ingestion of alcohol and/or toxic substances was confirmed.

The most frequent injury mechanisms leading to HI were casual accidents in 54% of patients, followed by traffic accidents in 38%, work-related in 5% and assault in 3%.

Alertness clinical findings which led to the performance of CT brain scans (see figure 1) 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 91%, GCS 14 in 8% and GCS 13 in 0.6% of patients.

Among patients presenting with associated injuries, the location thereof was the limbs in 18%, face in 13%, chest in 8% and abdomen in 3% of the cases.

The result of the CT scan performed upon arrival in the A&E was as follows (see Figure 2): normal in 88% of patients, skull fracture in 4%, contusion foci in 4%, subarachnoid haemorrhage in 2%, subdural haemorrhage in 0.6% and intraparenchymatous haemorrhage in 0.6%.

Most of the 172 patients were admitted for observation into the SSU (97%). Only a small percentage of cases were



TABLE 1. Main Variables

Variables	Patients (N = 172)
Age in years (range and mean)	14-95 (49.8)
Sex	
Male	121 (71%)
Female	51 (29%)
Treated with anticoagulant medication	5 (3%)
Mechanism of injury	
Accidental	93 (54%)
Traffic	66 (38%)
Occupational	9 (5%)
Assault	4 (3%)
Clinical findings	
Amnesia	85 (52%)
Vomiting (>2)	15 (8%)
Dizziness	54 (31%)
Headache	110 (63%)
Scalp lesion	46 (26%)
Loss of consciousness	120 (70%)
Alcohol or toxic substances	10 (6%)
Glasgow coma scale	
15	158 (91%)
14	13 (8%)
13	1 (0.58%)
Associated injuries	
Limbs	31 (18%)
Facial	24 (13%)
Chest	15 (8%)
Abdomen	4 (3%)
Pathological cranial X-ray	3 (2%)
Initial CT scan	
Normal	153 (88%)
Skull fracture	7 (4%)
Contusion foci	8 (4%)
Subarachnoid haemorrhage	2 (2%)
Subdural haemorrhage	1 (0.6%)
Intraparenchymatous haemorrhage	1 (0.6%)
Second visit to A&E	6 (3%)
Follow-up CT scan	
Normal	15 (9%)
Improvement of contusion foci	8 (53%)
Skull fracture	2 (13%)
Skull fracture	3 (21%)
Pathological	2 (13%)
Destination	
SSU	167 (97%)
Internal Medicine Dept.	4 (2%)
Other	1 (0.58%)
Stay at SSU in days (range and average)	1-7 (1.6)



Figure 1. Clinical Findings.

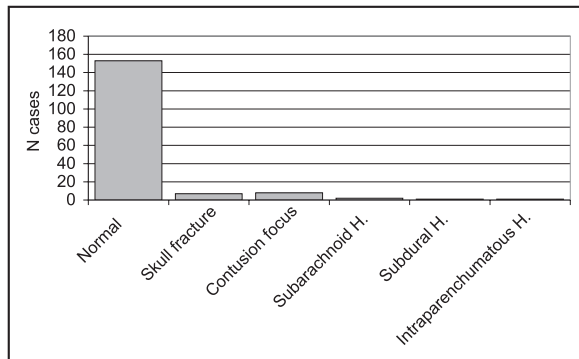


Figure 2. Initial Brain CT scan.

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.

Among the patients who were hospitalised, 15 (8%) were required by their respective physicians to undergo a follow-up CT brain scan after 15 days, with results as shown in Figure 3.

DISCUSSION

We observed that a total of 1,694 cases of HI were treated during the study period, which representing 1% of the total A&E visits per year. These we selected only 172 cases which met the aforementioned inclusion criteria of our study.

The higher number of males treated for this cause, 71% v. 29% of females, is worthy of note. This may be due to the fact that most of the HIs pertain to casual, sports or occupational accidents, aspects in which males have a statistically higher presence.

Alcohol and toxic substances were only observed in 6% of

admitted to the internal medicine department (2%) or to other departments (1%).

The mean length of stay of the patients in the SSOU was

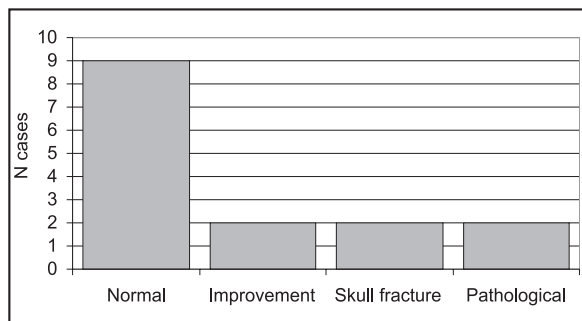


Figure 3. Follow-up CT scan.

the patients who had sustained a HI, via blood analysis for alcohol detection and urine analysis for toxic substances. This datum might lead us to minimize the true dimension of the role of such drugs in this and other pathologies. A possible explanation might be that this is not a routine test performed in patients with minor HIs, being reserved for those with a low GCS or associated legal implications.

Despite amnesia and loss of consciousness being alarming symptoms present in more than 50% of the patients, these do not correlate with a higher rate of pathological CT scans or with the need for referral to a neurosurgical centre.

The length of the hospital stay depended, in most cases, on

associated injuries sustained by the patients admitted into the SSOU. 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 HIs^{6,7}, as well as the use of clinical scales when requesting a CT scan¹²⁻¹⁵, given the low probability of pathological clinical findings in such cases and the minimal rate of complications.

SSOUs are an ideal place for the control of the symptoms and evolution of minor HIs in hospitals without a neurosurgical department.

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