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Severe pediatric head injuries (I). Epidemiology, clinical manifestations and course☆

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KEYWORDS
Pediatric head injury;
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Abstract
Objective: To describe the epidemiology, clinical manifestations and evolutive characteristics of pediatric patients with severe head injury (SHI).
Material and method: A review was made of the patients admitted to the pediatric intensive care unit (PICU) with SHI between July 1983 and December 2009.
Results: Of the 389 patients with head injuries admitted to the PICU during the study period, 174 (45%) presented SHI. The mean age in this group was of 67 ± 9 months, with a Glasgow Coma Score (GCS) of 5.5 ± 1.8 and a PRISM score of 10.7 ± 6.7. The most frequent etiology of SHI was traffic accidents (56%), though these have decreased significantly in the last decade (58.5% vs 45.3%; $p < 0.001$). Twenty-one percent of the patients required evacuation of the lesions detected by computed tomography (CT), and 39% presented severe diffuse encephalic injury (DEI). Seventy-nine percent of the patients in whom intracranial pressure (ICP) was monitored presented intracranial hypertension. Sequelae of clinical relevance were recorded in 59 patients (39%), and proved serious in 64% of the cases. The mortality rate in this patient series was 24.7%. Intracranial hypertension decreased significantly in the last decade (88% vs 54%; $p < 0.05$), and clinical recovery has improved (23.3% vs 63.1%; $p < 0.001$).
Conclusions: (a) The incidence of traffic accidents has decreased in the last decade in the studied population; (b) patients with SHI in which ICP was monitored showed a high incidence of intracranial hypertension; (c) morbidity–mortality among pediatric patients with SHI has decreased over the course of the study period.

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PALABRAS CLAVE
Traumatismo craneoencefálico pediátrico;
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Clínica;
Evolución

Traumatismo craneoencefálico pediátrico grave (I). Epidemiología, clínica y evolución

Resumen
Objetivo: Describir las características epidemiológicas, clínicas y evolutivas de los pacientes pediátricos con traumatismo craneoencefálico grave (TCEG).
Material y método: Revisión de los pacientes ingresados en una unidad de medicina intensiva pediátrica (UMIP) con TCEG en el periodo comprendido entre julio de 1983 y diciembre de 2009.
Resultados: De los 389 pacientes con traumatismo craneoencefálico (TCE) ingresados en nuestra unidad durante el periodo de estudio, presentaron TCEG 174 (45%). La media de edad de este grupo fue 67 ± 9 meses, con una puntuación media en la escala de Glasgow (GCS) de $5,5 \pm 1,8$ y una puntuación PRISM media de $10,7 \pm 6,7$. La etiología más frecuente de los TCEG fueron los accidentes de tráfico (56%), aunque en la última década existe una disminución significativa de su incidencia (el 58,5 frente al 45,3%; $p < 0,001$). Un 21% de los pacientes precisaron evacuación de la lesión objetivada en la TC, objetivándose en un 39% lesión encefálica difusa (LED) grave. Un 79% de los pacientes en los que se monitorizó la presión intracraneal (PIC) presentaron hipertensión intracraneal (HTC). Las secuelas de relevancia clínica se objetivaron en 59 pacientes (39%), siendo graves en el 64% de ellos. La mortalidad de la población estudiada fue de un 24,7%. La incidencia de HTC fue significativamente menor en la última década estudiada (el 88 frente al 54%; $p < 0,05$), con una mejor recuperación clínica (el 23,3 frente al 63,1%; $p < 0,001$).
Conclusiones: a) La incidencia de los accidentes de tráfico disminuyó en la última década en la población estudiada; *b*) los pacientes con TCEG en los que se monitorizó la PIC presentaron una alta incidencia de HTC, y *c*) la morbimortalidad de los TCEG pediátricos disminuyó a lo largo del periodo de estudio.

Introduction

Head injuries (HIs) remain an important problem in the pediatric population, despite the efforts made to reduce their incidence,[1–5] which in the developed countries has been estimated to be about 75–125 cases/100,000 children/year. Of these cases, approximately 7–10% are regarded as serious.[1,6]

In comparison with the general population,[7] pediatric patients suffer a greater frequency of intracranial injuries, with a different response to injury and a better prognosis for one same degree of brain damage, as a result of anatomical and physiopathological factors.[8]

In pediatric patients, where brain maturation is in full process, it is essential to avoid secondary lesions which in association with the initial primary injury characterizing all HIs, can increase morbidity–mortality by up to 30–40%.[1,6,9]

Our more than 25 years of experience as a provincial reference center in the management of children with serious head injuries (SHIs) has allowed us to conduct the present study.

The objectives of the study have been: (a) to describe the main epidemiological, clinical and evolutive characteristics of pediatric patients with SHIs; and (b) to analyze their differences in different periods of the study and in different age groups.

Material and method

Study: retrospective (August 1983–December 1998), prospective (January 1999–December 2009).

Setting: (a) reference population: children aged between 1 month and 14 years, with HIs, exhibiting a Glasgow Coma Scale (GCS) score of ≤ 8; (b) hospital center: third-level hospital serving as provincial reference center (The Canary Islands (Spain): Gran Canaria, Fuerteventura and Lanzarote), serving a pediatric population of 137,538 children.

Study variables

1. Quantitative variables: age, GCS score, pediatric risk of mortality score (PRISM), duration of mechanical ventilation, stay in ICU, Glasgow Outcome Scale (GOS).
2. Qualitative variables: gender, origin, mortality, cause of HI, associated extracranial injuries, lesions on cranial CT scan, sequelae, presence of hyperglycemia, anemia, shock or pupil mydriasis, need for monitoring of intracranial pressure (ICP) and jugular venous oxygen saturation (SjO_2), existence of intracranial hypertension (ICH), and need for mechanical ventilation.

Criteria employed

1. GCS: following patient stabilization we used the first reflected value of the classical Glasgow scale[10] or its modification for pediatric patients.[11] The latter is distinguished from the classical scale only in terms of the verbal response section, which is scored as follows: babbling (5), irritable crying (4), crying in response to pain (3), complaint or sighing in response to pain (2), no response (1).