



ORIGINAL

Falls from heights in Pediatrics. Epidemiology and evolution of 54 patients[☆]

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KEYWORDS

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Cranial trauma;
Falls from buildings

Abstract

Objective: Falls from heights are a major preventable cause of morbidity and mortality in children. The aims of this study are to describe the evolution and long-term prognosis of such patients, to identify the pediatric population at greatest risk of falling from heights in our setting, and to define the variables at admission capable of predicting mortality.

Design: A retrospective patient cohort review was carried out.

Setting: Pediatric patients.

Population: Pediatric patients admitted to the Pediatric Intensive Care Unit following a fall from a height of over 2 m, in the last 10 years.

Results: Ninety-two percent of the patients fell from buildings. Out of a total of 54 patients suffering falls, 51% were preschoolers. Fifty percent of the adolescents cases corresponded to attempted suicide. Fifty-two percent of the children were immigrants. Head injuries were the most common type of traumatism. The mortality rate was 12%. Eighty-two percent of the patients with a follow-up period of 2 years were leading an independent life. The independent predictors of mortality were the height of the fall, the Glasgow coma score and pediatric trauma index score upon admission, the presence of anemia, acidosis and hypotension upon admission, the need for vasoactive drugs, and the presence of severe head injury with the development of intracranial hypertension.

Conclusions: Falls from heights occur mainly in unsupervised preschool children and teenagers attempting suicide. These patients have a high number of injuries, a high mortality rate, and important care needs. Most survivors are able to lead an independent life over the long term. Preventive measures should be implemented in risk populations.

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PALABRAS CLAVE

Politraumatismo;
Caída accidental;
Caída desde altura;
Trauma craneal;
Caída desde edificios

Caídas desde grandes alturas en Pediatría. Epidemiología y evolución de 54 pacientes**Resumen**

Objetivo: Las caídas desde altura son una importante causa de morbimortalidad prevenible en la edad pediátrica. Los objetivos de este estudio son describir la evolución y el pronóstico a largo plazo de los pacientes precipitados, identificar la población pediátrica con mayor riesgo de sufrir caídas desde altura en nuestro medio y definir las variables al ingreso asociadas a mortalidad.

Diseño: Estudio de una cohortes retrospectivo.

Ámbito: Pediatría.

Participantes: Pacientes politraumatizados ingresados en el servicio de Unidad de Cuidados Intensivos Pediátricos tras haberse precipitado desde una altura superior a dos metros a lo largo de 10 años.

Resultados: El 92% de las caídas se produjeron desde edificios. De 54 pacientes precipitados, el 51% fueron preescolares. En adolescentes, el intento de suicidio ha sido la causa en la mitad de los casos. Un 52% pertenece a familias inmigrantes. El traumatismo craneoencefálico fue la lesión más frecuente. La mortalidad fue del 12%. De los pacientes en los que se realizó seguimiento a los dos años, el 82% llevaban una vida independiente sin secuelas. Los factores independientes asociados a mortalidad fueron: la altura de la caída, la puntuación en la Escala de Coma de Glasgow y en el Índice de Trauma Pediátrico, la anemia, la acidosis y la hipotensión al ingreso, la necesidad de drogas vasoactivas, y la presencia de TCE grave con desarrollo de hipertensión intracraneal.

Conclusiones: Las caídas desde grandes alturas se producen sobre todo en preescolares sin supervisión y en adolescentes por tentativa de suicidio. Estos pacientes presentan un gran número de lesiones, una alta mortalidad y altas necesidades asistenciales. La mayoría de los supervivientes llevan una vida independiente a largo plazo. Sería necesario implantar medidas preventivas, sobre todo en la población de riesgo.

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Introduction

Accidental falls from heights are among the leading causes of death and permanent brain and bone damage in children.¹ "Falls from a height" are generally taken to represent falls from a height of over 2 m.

In the United States, the annual incidence of falls from buildings is 2.81 per 100,000 inhabitants,²⁻⁵ reaching rates of 37 per 100,000 inhabitants in developing countries.⁶⁻¹⁰ There are no incidence or prevalence data for Spain.

Falls from heights are the most frequent cause of emergency department consultations due to trauma (995 cases per 100,000 subjects under 18 years of age annually),^{11,12} and are considered to be the fourth most common cause of trauma-related death after traffic accidents, burns and drowning.¹³⁻¹⁵ The percentage mortality rate referred to falls from a height among pediatric patients is 5.9% in the developed world.¹⁶ Thirty-three percent of the serious head injuries recorded in infants under 2 years of age in Spain are due to falls from a height.¹⁷ Ninety-five percent of these children fall from buildings, particularly in the warm months and in the late afternoon hours.

The height from which the victims fall, the presence of head injuries, and findings indicative of poor prognosis upon admission are the main mortality predictors in children suffering falls from a height.¹⁸ Some population-based studies define age, gender and a low socioeconomic level as independent risk factors for accidents of this kind.¹⁹

The Children Can't Fly program in the United States proved able to lower the proportion of children falling from buildings by 96%.^{20,21}

Although there are no incidence data in our setting, falls from a height are an important cause of preventable morbidity–mortality in the pediatric population. The aim of the present study is to describe the lesions profile, the medical care needs, the complications and the long-term prognosis of fall victims admitted to a Pediatric Intensive Care Unit (PICU) during the last decade. It also aims to identify the pediatric population at greatest risk of suffering falls from a height in our setting, and to define the variables upon admission capable of predicting mortality in these patients.

Patients and methods

A review was made of the cohort of polytraumatized children admitted to the PICU of Niño Jesus University Children's Hospital, a pediatric polytraumatism reference unit in the Community of Madrid (Spain), covering the period between August 2001 and August 2010. The study included those children in which the mechanism of injury was a fall from a height of over 2 m. The data were obtained by reviewing the clinical histories and through telephone interviews of the patients or their parents.

Personal data were collected, along with information referred to disease and social antecedents of interest, if any. Regarding the fall, we documented the time and place of the accident, the people accompanying the children at the time, the presence or absence of buffering of the fall, and who provided first care. Certain vital signs and laboratory test values recorded at the time of first care were analyzed: the venous bicarbonate and pH values (acidosis being regarded

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