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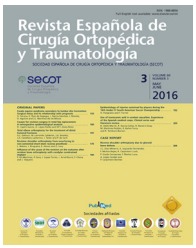

ORIGINAL ARTICLE

Risk factors for in-hospital mortality following hip fracture☆

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KEYWORDS
Hip fracture;
In-hospital mortality;
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Abstract
Objective: To identify and quantify the risk factors for in-hospital mortality in patients older than 65 years with a hip fracture.
Materials and methods: Retrospective review of prospectively collected data. We studied a cohort of 331 hip fracture patients older than 65 years of age admitted to our hospital from 2011 to 2014. Patients demographics, type of residence, physical function, mobility, prefracture comorbidities data, cognitive status, anti-aggregant and anticoagulant medication, preoperative haemoglobin value, type of fracture, type of treatment, surgical delay, and complications, were recorded.
Results: The average age was 83, 73% female, and 57% had sustained a subcapital fracture. In 62.8% pre-fracture baseline co-morbidities were equal or greater than 2. The in-hospital mortality rate was 11.4%. In univariate analysis, age over 90, male gender, haemoglobin $\leq$10 g/dl, no antiplatelet agents, orthopaedic treatment, number of co-morbidities $\geq$2, Charlson index $\geq$2, age-adjusted Charlson index $\geq$6, congestive heart failure, asthma, and rheumatologic disease were associated with in-hospital mortality.
Conclusions: Preoperative patient-related factors have a strong relationship with in-hospital mortality in a hip fracture patients aged older than 65 years. These factors are non-modifiable; we recommend the development of protocols to reduce in-hospital mortality in this group of patients.

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PALABRAS CLAVE
Fractura proximal fémur;
Mortalidad intrahospitalaria;
Factores pronósticos

Factores de riesgo de mortalidad intrahospitalaria en la fractura proximal de fémur

Resumen
Objetivo: Identificar y cuantificar los factores relacionados con la mortalidad intrahospitalaria en pacientes mayores de 65 años con fractura proximal de fémur.
Material y métodos: Estudio observacional de cohortes retrospectivo de una base de datos prospectiva de pacientes mayores de 65 años con fractura proximal de fémur entre 2011 y 2014. Se incluyeron en el estudio 331 pacientes. Se registraron variables demográficas, procedencia del paciente, grado de deambulación y dependencia, comorbilidades asociadas, estado mental, toma de medicación anticoagulante o antiagregante, valor de la hemoglobina al ingreso, tipo de fractura, tipo de tratamiento, demora quirúrgica y presencia de complicaciones.
Resultados: La edad media de los pacientes fue de 83 años. En un 73% eran mujeres. Y el 57% presentaron fractura subcapital de fémur. El número de comorbilidades era igual o mayor de 2 en un 62,8%. La mortalidad intrahospitalaria fue del 11,4%. En el estudio univariante, la edad mayor de 90 años, sexo varón, no antiagregación, el tratamiento ortopédico de la fractura, un valor de la hemoglobina ≤ 10 g/dl, un número de comorbilidades ≥ 2, un índice de Charlson ≥ 2, un índice de Charlson ajustado a la edad ≥ 6, la insuficiencia cardíaca, el asma, la enfermedad reumática, fueron variables asociadas a la mortalidad intrahospitalaria.
Conclusiones: Los factores preoperatorios relacionados con el paciente influyen directamente en la mortalidad intrahospitalaria del paciente con fractura proximal de fémur mayor de 65 años. Dado que estos factores no son modificables, recomendamos el desarrollo de protocolos de actuación que permitan reducir la mortalidad intrahospitalaria en este grupo de pacientes.

Hip fractures (proximal femur fractures) are both a medical and social problem because the incidence in the elderly is so elevated. In spite of the advances in surgical treatment and regional anaesthesia techniques, the published mortality rates after hip fracture are still very high, ranging between 6% and 9% in the first month after the fracture, between 13% and 19% at 3 months and from 26% to 33% at a year.[1–5]

In-hospital hip fracture mortality is defined as the number of patients with hip fracture that die during their hospital stay multiplied by 100, divided by the total number of patients with hip fracture. The Spanish National Healthcare System considers it to be an inpatient quality indicator for hospitals.[6,7] That is why reducing this indicator as much as possible should be a primary objective for orthopaedic surgery and trauma services.

Giannoulis[8] reviewed the last few years of publications on mortality in the first month after surgery and concluded that there was a lack of consensus about patient management protocols, optimum surgical delay time, rehabilitation protocols and length of hospital stay. These disparities make it complicated to compare data and apply similar multidisciplinary approaches.

The factors associated in the literature with 30-day mortality in different studies can be grouped into modifiable and non-modifiable. The first are patient-related, such as age, sex, comorbidities and fracture type; while non-modifiable factors have to do with treatment, such as surgical delay, anaesthesia technique or type of surgery.[9–13] There are not many studies on in-hospital mortality in proximal hip fracture, either prospective[14–16] or retrospective,[3,17,18] that allow us to know the factors having the greatest influence.

Our working hypothesis was that the patient-related factors would have a greater influence on in-hospital mortality in the patient with hip fracture. To verify this, our main objective was to identify and quantify the prognostic factors having to do with in-hospital mortality in patients older than 65 years with hip fracture in our hospital.

Materials and method

This was a retrospective observational study of cohorts of the patients older than 65 years in our prospective hip fracture database between January 2011 and December 2014. The criteria for exclusion were age less than 65 years, pathological fracture, victims of multiple traumas, bilateral fracture, or history of previous hip fracture.

Patient age, sex and origin were recorded upon admission. The type of hip fracture was classified as subcapital fracture, pertrochanteric fracture and subtrochanteric fracture.

The presence of associated comorbidities was established by the patient history or by review of previous hospital admissions. Comorbidities registered were high blood pressure, auricular fibrillation, heart failure, heart disease, cerebrovascular disease, dementia, epilepsy, Parkinson's Disease, Chronic Obstructive Pulmonary Disease, asthma, diabetes, rheumatic disease, renal failure and peripheral vascular insufficiency.[19] We recorded the number of comorbidities, Charlson Comorbidity Index (CCI)[20] and age-adjusted CCI.[21] Administration of anticoagulant and antiaggregant medication was also registered.