

ORIGINAL ARTICLE

**Risk factors for mortality after surgery of osteoporotic  
hip fracture in patients over 65 years of age** ☆



M.I. Aranguren-Ruiz<sup>a,\*</sup>, M.V. Acha-Arrieta<sup>b</sup>, J.M. Casas-Fernández de Tejerina<sup>c</sup>,  
M. Arteaga-Mazuelas<sup>d</sup>, V. Jarne-Betrán<sup>d</sup>, R. Arnáez-Solis<sup>b</sup>

<sup>a</sup> Servicio de Gestión de la Prestación Farmacéutica, Servicio Navarro de Salud, Pamplona, Spain

<sup>b</sup> Servicio de Medicina Interna, Complejo Hospitalario B de Navarra, Pamplona, Spain

<sup>c</sup> Servicio de Medicina Interna, Complejo Hospitalario A de Navarra, Pamplona, Spain

<sup>d</sup> Servicio de Medicina Interna, Hospital García Orcoyen, Estella, Spain

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**KEYWORDS**

Elderly;  
Risk factor;  
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**Abstract**

*Objective:* To evaluate, from a clinical perspective, and with easily identifiable variables, those factors that influence the survival of patients admitted to a care unit designed for the comprehensive treatment of patients with hip fracture after being surgically treated.

*Material and methods:* A prospective study was conducted on a cohort of patients ( $n=202$ ) aged 65 years or older with a low impact hip fracture, who were surgically intervened in a tertiary hospital. An analysis was performed to determine mortality at 90 days, and at one and 2 years after surgery using demographic, clinical, analytical, and functional variables.

*Results:* The independent risk factors of mortality in the 3 periods analyzed were age ( $P=.047$ ,  $P=.016$ , and  $P=.000$  at 90 days, 1, and 2 years, respectively) and a low Barthel index ( $P=.014$ ,  $P=.005$ , and  $P=.004$  at 90 days, 1, and 2 years, respectively). Male sex ( $P=.004$ ) and a high risk for anaesthesia ( $P=.011$ ) were only independent risk factors of mortality at 2 years after surgery.

*Discussion and conclusion:* Age and dependency were the major determining factors of mortality at 30 days, 1, and 2 years after surgery for hip fracture. Both are easily measurable to identify patients susceptible to poor outcomes, and could benefit from a more thorough care plan.

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\* Corresponding author.

E-mail address: [isaara30@hotmail.com](mailto:isaara30@hotmail.com) (M.I. Aranguren-Ruiz).

**PALABRAS CLAVE**

Fractura de cadera  
osteoporótica;  
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Dependencia

## Factores de riesgo de mortalidad tras intervención quirúrgica de fractura de cadera osteoporótica en pacientes mayores

**Resumen**

**Objetivo:** Valorar desde una perspectiva clínica y con variables fácilmente identificables aquellos factores que influyen en la supervivencia de los pacientes ingresados en una unidad asistencial diseñada para el tratamiento integral de pacientes con fractura de cadera, tras ser intervenidos quirúrgicamente.

**Material y método:** Estudio prospectivo de una cohorte de pacientes (n = 202) de edad igual o mayor de 65 años con fractura de cadera de bajo impacto, intervenidos quirúrgicamente en un hospital terciario, que analizó la mortalidad a 90 días, 1 y 2 años tras la intervención con relación a variables demográficas, clínicas, analíticas y de funcionalidad.

**Resultados:** Los factores de riesgo independientes de mortalidad en los 3 periodos analizados fueron la edad (p = 0,047; 0,016 y 0,000 a 90 días, 1 y 2 años, respectivamente) y el bajo índice de Barthel (p = 0,014; 0,005 y 0,004 a 90 días, 1 y 2 años respectivamente). Sin embargo, el sexo masculino (p = 0,004) y el riesgo para anestesia (p = 0,011) resultaron ser solo factores de riesgo independientes de mortalidad a los 2 años de la intervención quirúrgica.

**Discusión y conclusión:** Tanto a corto plazo (30 días) como hasta los 2 años de la intervención quirúrgica por fractura de cadera los mayores condicionantes de mortalidad fueron la edad y la dependencia. Ambos son parámetros fácilmente medibles que permiten identificar a pacientes susceptibles de mala evolución desde el ingreso y que podrían beneficiarse de una atención más exhaustiva.

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**Introduction**

Hip fractures affect the proximal third of the femur, between the head and 5 cm below the trochanter minor.<sup>1</sup> Low impact fractures reduce life expectancy and may be considered as a risk factor for short- and long-term mortality.<sup>2</sup> Most of the persons affected are over 65 years of age and 75% are female, often with chronic diseases, at risk for functional decline<sup>3</sup> and mortality due to both the fracture and its complications as well as their own fragility.<sup>4</sup> The risk factors described for mortality within the term of one month following an osteoporotic hip fracture include, among others, advanced age, male gender, prior comorbidity or cognitive impairment<sup>5,6</sup> and, in the longer term (from 1 to 3 years after), the other factors added include high-risk indications as defined by the American Society of Anaesthesiologists (ASA), dependency, scant functional capacity or malnutrition.<sup>7-9</sup> The personal characteristics of patients are, in and of themselves, risk factors for mortality that require comprehensive multidisciplinary care for peri-operative preparation and maintenance, and also for the prevention and handling of complications. This care model has been shown to reduce mortality one month<sup>10,11</sup> and one year<sup>8,11</sup> after the surgical procedure.

The aetiopathogenesis of hip fractures involves osteoporosis and falls.<sup>12</sup> In view of the ageing of the population, the number of cases will increase in the decades ahead, although some age-adjusted rates show stagnation or reduction.<sup>13</sup> In Spain, an estimate produced in 2013 considered the risk of hip fracture after 80 years of age to range from 6 to 32% in women and from 2.8 to 19.2% in men.<sup>14</sup> The incident rate published is 511 cases per annum for every

100,000 inhabitants over 65 years of age<sup>15</sup> and a year-on-year increase of close to 1.5% is observed when comparing the rates per 100,000 inhabitants. Approximately 90% of all cases occur in persons over 64 years of age.<sup>16</sup>

The goal of this paper is to analyze the factors associated with mortality 3 months, 1 year and 2 years after surgery for an osteoporotic hip fracture in patients aged 65 or over.

**Material and method**

Prospective observational study on osteoporotic hip fractures in patients aged 65 or older and operated on in a reference-level hospital with 2 years' follow-up. Throughout 2010, all patients were consecutively included if they were aged 65 or over and had been operated on for a low-impact hip fracture at what was then the "Virgen del Camino" Hospital in Pamplona, currently known as "Navarre Hospital Complex B". Patients were excluded if they died before the surgical procedure, or if they presented a high energy fracture, or were transferred to other hospitals or regions and it was not possible to maintain follow-up.

Patients were seen by an internal medicine specialist as well as an orthopaedic surgeon. They all received rehabilitation 24h after surgery and a social and family assessment was carried out by the Social Work Department. The patients' demographic, functional and clinical details were noted, along with any prior treatments and their level of dependency. Patients on anticoagulant therapy had this withdrawn and those receiving anti-platelet medication were switched to 100mg of acetylsalicylic acid from admission. Following removal of the surgical drainage 24h

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