

Outcomes After Hip Fractures Sustained In Hospital: A Propensity-Score Matched Cohort Study

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Background

Approximately 80,000 neck of femur fractures are treated in the United Kingdom each year. Almost 5% of these injuries occur when the patient has been admitted to hospital as an inpatient for another condition. Previous studies have shown that this group of inpatient hip fractures have poorer outcomes than patients who sustain their fracture in the community. These studies have been limited by selection bias. One of the methods that can be used to reduce the effect of selection bias in observational studies is propensity score matching, which has not been performed previously on a cohort of hip fracture patients.

Objectives

The primary aim of our study was to compare outcomes between patients who fractured their hip whilst a hospital inpatient vs patients who sustained their fracture in the community (outpatients).

The secondary aim of the study was to ascertain the strongest predictors of mortality in our series of hip fracture patients.

Study Design & Methods

Data on all hip fracture admissions aged 65 years or over between 1st May 2007 and 31st March 2018 were analysed from a local prospectively collected hip fracture registry. The data collected in this registry is based on the Standardised Audit of Hip Fractures in Europe. Outcome measure included mortality (30-day and 1-year), mean length of stay (LOS) and surgical site infection (SSI).

All statistical analysis was undertaken using SPSS v24. Independent T and chi-squared tests were used to measure differences between groups. Survival analysis with log rank test was performed. Multivariable logistic regression was performed to establish predictors of mortality.

Baseline demographics and comorbidities were used to generate propensity scores for each hip fracture patient with complete data. Inpatients were matched to outpatients in a 1:1 ratio. Outcomes were compared between groups after matching.

Results

7,592 patients presented during our study period, of whom 338 were identified as suffering an inpatient hip fracture. At baseline, the inpatient group had significantly higher rates of chronic kidney disease, diabetes, cerebrovascular accident, chronic obstructive pulmonary disease (COPD) and active cancer than the outpatient group.

After propensity score matching, we compared 222 patients in the outpatient group with 229 in the inpatient group. There was no significant difference in baseline characteristics or comorbidities after matching. There was a significantly higher 30-day mortality in the inpatient group (16%) vs outpatient (10%), $P=0.049$. There was also a higher one year mortality in the inpatient group (44%) vs outpatient group (34%), $P=0.03$. There was no significant difference in mean LOS or SSI. Survival analysis showed log rank <0.05 for both 30-day and 1-year mortality.

Regression analysis show the strongest predictors for 30-day mortality in our series included being male (OR 2.45, $P<0.001$) having an inpatient hip fracture (OR 1.88, $P<0.001$) and having COPD (OR 1.64, $P<0.001$). The strongest predictors for 1-year mortality include being male (OR 2.02, $P<0.001$), having active cancer (OR 1.81, $P<0.001$) and having an inpatient hip fracture (OR 1.66, $P<0.001$).

Conclusions

Patients breaking their hip whilst inpatients have significantly poorer outcomes than those falling in the community even after adjusting for comorbidities. Dedicated guidelines are needed for treatment of the inpatient NOF with a particular emphasis on optimization of medical management.