

Being Admitted to Hospital with a Hip Fracture at the Weekend: Is There a Difference in Mortality?

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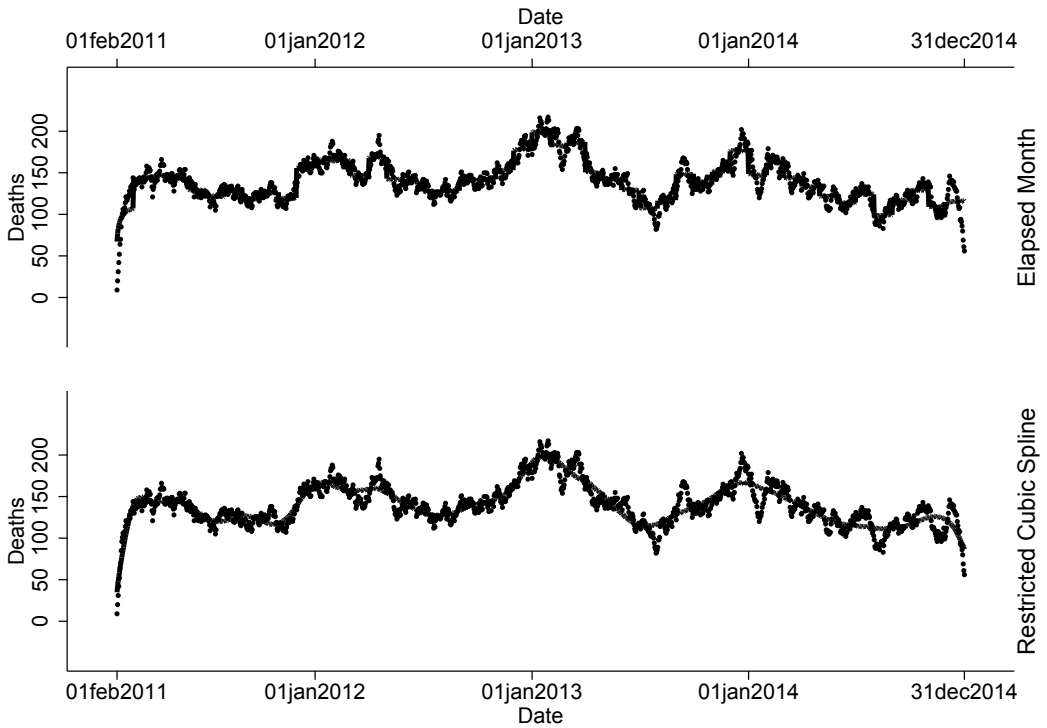
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Background/Purpose: Recent publications suggest that there is an increase in 30-day mortality in patients admitted to hospital at the weekend. However, these findings have not been universally accepted, with much criticism from health-care professionals, statisticians, and epidemiologists with regard to inadequate case mix adjustment, and failures to consider the complexities of resource provision in the statistical model. Using data prospectively collected by a National Hip Fracture Database, we aimed to explore the association between the times of admission, surgery, and discharge, inpatient stay, and 30-day mortality in a large register of patients.

Methods: Using data from 237,001 patients between February 1, 2011 and December 31, 2014, we explored the association between time of admission, surgery, inpatient stay, and discharge with 30-day mortality in patients with hip fractures using logistics and Poisson regression. We adopted a progressive temporal case mix adjustment strategy when investigating time of admission, surgery, and discharge, adjusting for preadmission characteristics (fracture type, ASA [American Society of Anesthesiologists] grade, abbreviated mental test score, pathological fracture, mobility, sex, age, preadmission location), nonsurgical interventions (falls assessment, multidisciplinary team meeting), and surgical interventions (anesthetic type, operation type). We conducted extensive sensitivity analyses allowing for different seasonal specifications (month indicators, elapsed months, Fourier series, restricted cubic splines) and investigated the effect of missing data using a multiple imputation model. Results from logistic regression models are reported as odds ratios (ORs). When investigating the association between inpatient stay and 30-day mortality, we adopted a stratified (by age and sex) time-series approach using Poisson regression; results are interpreted as incidence rate ratios (IRRs).

Results: Day of admission and surgery were crudely associated with mortality. However, the association between day of admission and mortality was attenuated after adjusting for the effect of day of surgery. In parsimonious models, Sunday surgery was associated with a 10% increase in odds of death at 30 days (OR 1.095, 95% CI [1.044, 1.150], $P = 0.0001$), surgery more than 24 hours from admission was associated with a 9% increase in odds of death at 30 days (OR 1.089, 95% CI [1.053, 1.126], $P \leq 0.0001$), but out of hours surgery was not associated with increased mortality (OR 1.015, 95% CI [0.945, 1.091], $P = 0.68$). Day of discharge from hospital prior to 30 days was not associated with any increase in the risk of deaths ($P > 0.05$). During the inpatient stay, seasonality dominates the association within inpatient mortality (Figure 1). However, weekends were associated with a lower incidence of death than weekdays (IRR 0.990, 95% CI [0.982, 0.998], $P = 0.01$).

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.



Conclusion: Despite recent statements to the contrary, weekend admissions are not associated with increased mortality in patients with hip fracture. It appears that surgical provision (Sunday trauma list and surgery within 24 hours of admission) is the dominating modifiable risk factor that is associated with short-term mortality. Furthermore, the small reduced incidence of death during the inpatient stay at weekends after hip fracture is suggestive of at least equivalent care to that of weekdays.