International Journal of Population Data Science

Journal Website: www.ijpds.org

The impact of dementia and other comorbidities on increased risk of subsequent hip fracture following hip fracture in Australia: a competing risk approach

Harvey, Lara[1*], Mitchell, Rebecca[2], Brodaty, Henry[3], Draper, Brian[3], and Close, Jacqueline[1]

[1]Neuroscience Research Australia

[2]Macquarie University

[3]Centre for Healthy Brain Ageing, School of Psychiatry, UNSW

Objectives

Older people with hip fracture are at increased risk of subsequent hip fracture. This study evaluates the relative impact of dementia, osteoporosis and other comorbidities on the increased risk of sustaining a subsequent fall-related hip fracture within ten years of a fall-related hip fracture, accounting for the competing risk of death.

Approach

Linked hospital and mortality data for all individuals aged 65 years and older admitted to a hospital in New South Wales, Australia, with a fall-related hip fracture over a ten year period between 1 January 2003 and 31 December 2013 were analysed. Dementia, osteoporosis and comorbidities contributing to the Charlson Comorbidity Index (CCI) were identified using up to 40 additional diagnosis codes recorded in the hospitalisation data and a 1 year lookback period. A competing risk approach was used to account for the high mortality inherent in this older population. Cause-specific hazard ratios (CSHRs) were calculated with age, sex and comorbidities included as covariates in the models. To account for the relatively long time frame of the study, dementia, osteoporosis and other CCI comorbidities were treated as time-dependent covariates.

Results

Of the 50,290 individuals who sustained a fall-related hip fracture during the study period, 7.6% (4,102) had a subsequent fall-related hip fracture. Compared to people without dementia, people with dementia were more likely to die within 30 days of initial fracture (12.6% vs 6.4%, p<0.0001) and to sustain a subsequent hip fracture (9.8% compared to 6.6%, p<0.0001). In the multivariate hazards regressions, people with dementia had a 2.5 fold (CSHR 2.48, 99.9%CI 2.38-2.58, p<0.0001) increased risk of death and two fold (CSHR 2.02, 99.9%CI 1.81-2.26, p<0.0001) increased risk of second hip fracture. Of the comorbidities, metastatic cancer (CSHR 3.48, 99.9%CI 3.12-3.88, p<0.0001) and severe liver disease (CSHR 3.24, 99.9%CI 2.62-4.01, p<0.0001) were most strongly associated with death. Renal disease (CSHR 1.53, 99.9%CI 1.24-1.88, p<0.0001), osteoporosis (CSHR 1.44, 99.9%CI 1.28-1.62, p<0.0001), congestive heart failure (CSHR 1.42, 99.9%CI 1.24-1.64, p<0.0001), and acute myocardial infarction (CSHR 1.22, 99.9%CI 1.03-1.44, p<0.0001) were associated with increased risk of subsequent hip fracture.

Conclusion

Hip fractures are costly injuries in terms of health care resources and the impact on the individual and their families. People with dementia are at twice the risk of sustaining a second hip fracture and death compared to people without dementia. Interventions including known effective treatments for osteoporosis as well as falls prevention should be targeted to this vulnerable population.

*Corresponding Author:
Email Address: l.harvey@neura.edu.au (L. Harvey)

http://dx.doi.org/10.23889/ijpds.v1i1.160