Consequences of a hip fracture among old people

Monica Långström Berggren
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Abstract
This thesis has three related aims: to describe the comorbidities, complications and causes of death among a representative population of old people with hip fracture; to evaluate whether a successful care model using comprehensive geriatric assessment, which reduced in-hospital falls and complications such as delirium, decubital ulcers and infections, has an effect on falls after discharge; and to assess whether adding home rehabilitation to the existing care model has an effect on length of stay in hospital, walking ability, complications and readmissions after discharge.

An orthogeriatric care model was evaluated, to assess whether it had any continuing effect on falls after discharge, in a randomized controlled study comprising 199 people with acute femoral neck fracture aged ≥70 years. Falls and new fractures as well as fall-incidence rate were compared between an intervention and a control group during a one-year follow-up, Poisson regression adjusted for overdispersion and observation time was used in the analyses. Comorbidities, complications and causes of death were described, and a multivariate analysis adjusted for potential confounders was used to analyze risk factors for all-cause mortality during a 3-year follow-up. After one year 44 participants had fallen and there were 138 falls in the intervention group compared with 55 participants who fell and 191 falls in the control group. The crude postoperative fall incidence was 4.16/1 000 days in the intervention group vs. 6.43/1,000 days in the control group. The incidence rate ratio was 0.64 (95% CI: 0.40–1.02, p=0.063). In total, 136 participants suffered at least one urinary tract infection; 114 suffered 542 falls and 37 sustained 56 new fractures, including 13 hip fractures, during a 3-year follow-up, and 79 out of 199 participants (40 %) died. Cardiovascular events (23 %), dementia (24 %), hip-fracture (19 %) and cancer (13 %) were the most common primary causes of death. Multivariate analyses revealed that cancer, dependence in personal activities of daily living, cardiovascular disease and dementia at baseline, pulmonary emboli and cardiac failure during hospitalization were all independent predictors of 3-year mortality.

Individually designed Geriatric Interdisciplinary Home Rehabilitation (GIHR) aimed at early hospital discharge was compared to conventional geriatric care in a randomized controlled study including 205 people with an acute hip fracture, aged ≥70 years. The use of walking devices and walking ability was assessed in interviews and gait speed was measured over 2.4 meters. Length of stay in hospital, complications, readmissions and days spent in hospital after initial discharge were compared between intervention and control groups. Binary logistic models adjusted for hypothetical confounders were used to analyze walking ability, the use of a walking device and the risk of falling after discharge. No significant differences were observed in walking ability, use of walking device, and gait speed at the 3- and 12-month follow-ups between the groups. At 12 months, 56.3% of the intervention group and 57.7% of the control group had regained or improved their prefracture walking ability. The median postoperative length of stay in the geriatric ward was 6 days shorter for the intervention group (p=0.003). Between discharge and the 12-month follow-up, comparisons between participants in GIHR group and the control group were as follows; 46 (43.4%) vs. 38 (40.0%) fell (p=0.828); 13 (12.3%) vs. 6 (6.5%) suffered an additional fracture (p=0.250); 36 (34.0%) vs. 30 (32.3%) presented with an infection (p=0.917); 12 (11.3%) vs. 6 (6.5%) suffered a cardiovascular event (p=0.344); 28 (25.8%) vs. 27 (29.0%) were readmitted to hospital (p=0.383); and the median number of days spent in hospital in total was 11.5 vs. 11.0 (p=0.353).

In conclusion, the successful care model, that reduced in-hospital falls and complications, did not have a prolonged effect on falls among older people with hip fracture, including people with cognitive impairment/dementia. This group of old people have multiple co-morbidities and suffer numerous complications. When home rehabilitation was added to the existing care model, regaining of walking ability in the short- and long-term was similar in both the GIHR participants and those receiving conventional geriatric care. In addition, the proportions of complications after discharge were not higher in the former group, even though their initial time in hospital was shorter. The results indicate that falls and complications after discharge are a major problem among old people with hip fracture. This thesis suggests that primary and secondary prevention of falls and fractures needs to become a part of routine care among old, fall-prone people.

Keywords
Hip fracture, Geriatric care, home rehabilitation, interdisciplinary rehabilitation, randomized control trial, accidental falls, complications, cause of death, walking ability, length of stay.