A comparison of case-finding strategies in the UK for the management of hip fractures

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
The study compared the cost-effectiveness of two osteoporosis case-finding strategies for postmenopausal women at risk of fracture. The authors concluded the National Osteoporosis Guideline Group (NOGG) strategy was more efficient than the Royal College of Physicians (RCP) strategy but sacrificed sensitivity in the elderly. The study did not appear to set out to conduct a full cost-effectiveness analysis. Insufficient costs and benefits were accounted for or reported in the analysis to fully evaluate cost-effectiveness.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The study compared the cost-effectiveness of two osteoporosis case-finding strategy guidelines for identifying postmenopausal women at significant risk of future fracture in order to provide preventative treatment.

Interventions
Two osteoporosis case-finding strategies were compared. These were derived from two guidelines: Royal College of Physicians (RCP) and National Osteoporosis Guideline Group (NOGG).

The RCP guideline referred postmenopausal women with fragility fracture based on clinical risk factors for bone mineral density (BMD) measurement. The RCP guideline recommended treatment defined by a T-score for BMD of up to -2.5 standard deviations in postmenopausal women.

The NOGG guideline assessed total probability of fracture by using the FRAX risk assessment tool (see Other Publications of Related Interest) which can account for risk factors that contribute independently of BMD, followed by BMD measurement for women close to a threshold value for treatment.

Under both strategies, women with prior fracture were given treatment. Women who met treatment criteria were assumed to receive generic alendronate.

Location/setting
UK/outpatient

Methods
Analytical approach:
The study simulated age specific cohorts of 1,000 patients aged between 50 and 85 at five-year intervals using multivariate Poisson regression to estimate the 10-year probability of fracture under both guidelines.

Effectiveness data:
Clinical data used in the analysis were the FRAX fracture risk prediction model that incorporated UK fracture and mortality rates. Femoral neck BMD was converted to a T-score using the young female reference data published from the third National Health and Nutrition Examination Survey (NHANES). Women who received alendronate were assumed to have their 10-year risk of fracture decreased by 35%.

Monetary benefit and utility valuations:
Not applicable.
Measure of benefit:
The measure of benefit was hip fracture cases identified.

Cost data:
Costs were estimated using data from a National Institute for Health and Clinical Excellence (NICE) health technology assessment of strontium ranelate for the prevention of fractures in postmenopausal women. Costs included GP (general practitioner) time and BMD scans (termed as acquisition costs) and the cost of alendronate for five years (termed as treatment costs). Acquisition costs and treatment costs were combined to derive the total cost per identified hip fracture and averted hip fracture.

Analysis of uncertainty:
Two alternative NOGG scenarios were considered (NOGG1 and NOGG2). NOGG1 examined the impact of applying FRAX to all the women without prior fracture regardless of having risk factors for fracture. NOGG2 did not automatically give all women with previous fractures treatment and instead assessed all women with risk factors (including previous fracture as a risk factor) with FRAX.

Results
In all age cohorts the RCP strategy required more scans per expected hip fracture. Up to age 70, the number of hip fractures identified were similar. After age 70, the NOGG strategy identified fewer hip fractures than the RCP strategy. For both strategies the cost per identified hip fracture and cost per hip fracture averted declined with age with NOGG less expensive at all levels.

In sensitivity analysis, NOGG1 identified similar numbers of hip fractures to RCP but was less efficient than NOGG in scans per identified fracture at all ages and less efficient than RCP at age 65 and up. NOGG2 identified fewer hip fractures with more scans for each hip fracture identified.

Authors’ conclusions
The authors concluded that compared to the RCP strategy, NOGG made more cost-effective use of BMD tests, particularly at younger ages. The authors concluded that in more elderly women, costs of the strategies were comparable but NOGG’s hip fracture identification could improve.

CRD commentary
Interventions:
The interventions were generally well described and appeared appropriate. Decision thresholds were not reported for FRAX risk assessment but there were numerous references to further FRAX risk assessment tool information.

Effectiveness/benefits:
Data used to generate model results were from large high-quality representative UK datasets. However, the analysis conducted using these data had several flaws. The authors’ comparison did not report sensitivity and specificity of the strategies. The total number of expected hip fractures was reported but true and false positives and negatives could have been reported and were not. The number of averted fractures was not reported. NOGG identified approximately half as many women at ages 75 and up and the average BMD t-score for those identified was lower; this indicated that on average NOGG identified higher-risk women.

Costs:
The study choice of cost data was from an appropriate and recent UK source but costs included in the model were insufficient. Only costs of the interventions were estimated; costs of hip fractures were not estimated. This meant that a key cost element in assessing the value of the different interventions was not considered. Because NOGG identified fewer hip fractures in elderly individuals, there would likely be additional costs for the hip fractures that would be prevented under RCP but not under NOGG. The authors acknowledged that NOGG identification of fractures could improve in the elderly but they did not quantify what costs resulted from lower specificity and this hid potential costs associated with the case-finding strategy.

Analysis and results:
The results did not analyse the effect that detecting fewer fractures could have in elderly women. The authors
acknowledged that the analysis was limited by only evaluating hip fractures, which they indicated make up 14% of osteoporosis fractures.

There was no indication that the model followed patients over time so the benefits and cost savings from preventing hip fractures were not captured by the model.

Concluding remarks:
The study did not appear to set out to conduct a full cost-effectiveness analysis. As such, insufficient costs and benefits were accounted for or reported in the analysis to fully evaluate cost-effectiveness.

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