Cost-effectiveness analysis of various screening methods for osteoporosis in perimenopausal Thai women

Panichkul S, Panichkul P, Sritara C, Tamdee D

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
This study evaluated the cost-effectiveness of screening strategies for the detection of osteoporosis in perimenopausal women. These strategies were compared with no intervention and with universal treatment. The analysis demonstrated that no intervention was the most cost-effective strategy, while screening with risk index and dual energy X-ray absorptiometry with treatment has the potential to be cost-effective, especially in high-risk populations. Overall, the study was not transparent in either its conduct or presentation, which limits the validity of the authors’ conclusions.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to undertake an economic evaluation of several screening strategies for the detection of osteoporosis in peri-menopausal Thai women with intact uteri and who were receiving hormone replacement therapy (HRT).

Interventions
The five screening strategies under examination were dual energy X-ray absorptiometry (DXA), quantitative ultrasound sonography (QUS), risk index (clinical risk factors identified using the Osteoporosis Self-Assessment Tools for Asians), two-step screening with QUS followed by DXA, and screening with risk index followed by DXA. These screening strategies were compared with no intervention and with universal treatment (a 5-year course of HRT with calcium supplements) without screening. Patients with positive screening results were given preventive treatment.

Location/setting
Thailand/primary care.

Methods
Analytical approach:
This economic evaluation was based on a decision model with a time horizon of 30 years. The authors did not explicitly state the perspective of the study.

Effectiveness data:
The clinical and epidemiological data were derived from a selection of known relevant studies, the identification of which was not described. Similarly, the designs and other characteristics of these clinical studies were not stated. The key clinical estimate was the accuracy of the screening strategies.

Monetary benefit and utility valuations:
None.

Measure of benefit:
The summary benefit measure was the rate of prevented fractures. This was estimated using the decision model. No discounting was applied.

Cost data:
The analysis included the costs of treatment, screening strategies, surgical procedures, postoperative care, hospital stay,
Analysis of uncertainty:
A deterministic sensitivity analysis was carried out on the cost of screening and prevalence of osteoporosis. The authors provided little information on this analysis.

Results
The expected cost per patient was $8.49 with no intervention, $207.82 with universal treatment, $88.42 with DXA, $146.48 with QUS, $127.67 with risk factors, $71.33 with QUS plus DXA, and $60.33 with risk factors plus DXA.

The risk of fracture was 0.005 with no intervention and 0.004 with all other screening strategies and universal treatment.

In comparison with no intervention, the incremental cost per fracture prevented was $199,330 with universal treatment, $79,930 with DXA, $137,990 with QUS, $119,190 with risk factors, $62,840 with QUS plus DXA, and $51,810 with risk factors plus DXA.

The sensitivity analysis showed that screening with risk index plus DXA with treatment became the most cost-effective strategy when the patients reached the postmenopausal period and had a very high risk index. In all other circumstances, no intervention remained the preferred strategy under realistic variation of the parameters.

Authors' conclusions
The authors concluded that no intervention was the most cost-effective strategy for the prevention of fractures in perimenopausal women at risk of osteoporosis. Screening with risk index and DXA with treatment has the potential for being cost-effective, especially in high-risk populations.

CRD commentary
Interventions:
The rationale for the selection of the comparators was clear in that the authors stated that all the available screening strategies were considered. A clear description of all screening strategies was given. In addition, universal treatment and no intervention were also considered; these represent two extremes in the management of osteoporosis.

Effectiveness/benefits:
The clinical analysis was poorly presented. The approach used to identify the primary sources of data was not described. Furthermore, no information on the types of studies considered was given. This limits the possibility of judging the validity of the clinical data used in the model. Other aspects of the analysis such as the issue of homogeneity amongst the studies, were not considered. The benefit measure represents a specific measure which is not easily compared with the benefits of other health care interventions. Furthermore, its derivation was unclear.

Costs:
The authors did not state the perspective adopted in the study. Indirect costs (i.e. productivity losses) were mentioned but it was not clear whether they were included or not. The sources of the resource use data were not reported, and the medical costs were derived from a local hospital. The price year was reported. However, discounting was not applied, although it would have been useful, given the long-term horizon of the study. Statistical analyses of the costs were not performed and the issue surrounding the economic data was not extensively addressed.

Analysis and results:
The synthesis of the costs and benefits considered only the comparison between each screening/treatment strategy and no intervention. Comparisons between the various screening strategies would have been interesting. The issue of uncertainty was only partially addressed, and neither the methods used nor the results of the sensitivity analysis were presented clearly.
Concluding remarks:
Overall, the study was not transparent in either its conduct or presentation, which limits the validity of the authors' conclusions.

Funding
None stated.

Bibliographic details

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Absorptiometry, Photon /economics /methods; Bone Density Conservation Agents /economics /therapeutic use; Cost-Benefit Analysis; Decision Trees; Female; Hormone Replacement Therapy /Humans; Mass Screening /economics; Middle Aged; Osteoporosis, Postmenopausal /diagnosis /drug therapy /epidemiology; Risk Assessment /economics /methods; Sensitivity and Specificity; Thailand /epidemiology; Ultrasonography /economics /methods

AccessionNumber
22006001613

Date bibliographic record published
07/09/2006

Date abstract record published
23/12/2008