The societal burden of poor persistence to treatment of osteoporosis in Sweden

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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
This study examined the societal burden of poor maintenance of prescribed treatments for osteoporosis and the cost-effectiveness of improving adherence. The authors concluded that poor persistence with the treatment of osteoporosis was an important and costly health burden, and it should be considered when evaluating interventions. Some key assumptions were made, but the methods were valid and the authors’ conclusions appear to be robust.

Type of economic evaluation
Cost-utility analysis

Study objective
This study examined the societal burden of poor maintenance of prescribed drugs for treatment-naive patients with osteoporosis and the cost-effectiveness of improving adherence.

Interventions
The two comparators in the primary analysis were perfect adherence, in which patients received treatment for five years and received the full expected clinical benefits, and real-world adherence, in which a proportion of patients discontinued treatment within five years and consequently lost some of the benefits of treatment. Four treatments were considered: alendronate, risedronate, strontium ranelate, and raloxifene.

In a secondary net benefit analysis, five improvements in the proportion of patients who adhered to treatment, compared with real-world adherence, were considered: 10%, 20%, 30%, 40%, and 50%.

Location/setting
Sweden/primary care.

Methods
Analytical approach:
The analysis was based on a published Markov model, with a lifetime horizon. The authors stated that a societal perspective was adopted.

Effectiveness data:
The clinical data were from a selection of studies that were known to the authors. Most of the data were from Swedish registries and databases, such as the Swedish Adherence Register Analysis, which provided data on the patients’ characteristics and persistence. The risk of fracture was age and gender adjusted and was from a large prospective European study. The treatment effect, which was the reduction in the risk of fracture, was mainly from clinical trial data. Two key assumptions were made: the treatment duration for full persistence was five years and the residual effects decreased linearly at a rate according to the time spent on treatment.

Monetary benefit and utility valuations:
The utility values were from published sources.

Measure of benefit:
Quality-adjusted life-years (QALYs) were the summary benefit measure and life-years were reported.
Cost data:
The economic analysis included the costs of morbidity (in-patient, out-patient, and nursing home care), drug and treatment management, informal care, and productivity lost. All costs were presented as category totals and were mainly from official Swedish sources and a previous Swedish study. The costs were estimated in Swedish kronor and converted to Euros (EUR). The price year was 2009.

Analysis of uncertainty:
Alternative scenarios were simulated to take into account the costs of extended survival and the costs of treating and disutility associated with side-effects. Different assumptions for the duration of the residual treatment effects were made.

Results
Compared with perfect adherence, real-world adherence led to an annual loss of 771 QALYs or 424 life-years. At a societal willingness-to-pay of EUR 60,000 per QALY, the health burden of reduced adherence was EUR 46.28 million. The waste of societal costs amounted to EUR 16.48 million, annually, and the total (monetary and health) annual burden of real-world adherence was EUR 62.76 million.

At a threshold of EUR 20,000 the total burden was EUR 31.90 million; at a threshold of EUR 40,000 it was EUR 47.33 million; and at a threshold of EUR 80,000 it was EUR 78.18 million.

Changes in the assumptions for residual effects and the inclusion of treatment-related side-effects reduced the estimated societal burden.

The net benefit analysis showed that, to improve the adherence proportion by 10%, it would be worthwhile spending EUR 225 per patient; to improve it by 20% could cost EUR 450 per patient; to improve it by 30% could cost EUR 676 per patient; to improve it by 40% could cost EUR 903 per patient; and to improve it by 50% could cost EUR 1,130 per patient.

Authors' conclusions
The authors concluded that poor persistence with the treatment of osteoporosis was an important and costly health burden, and it should be considered when evaluating interventions.

CRD commentary
Interventions:
The interventions were appropriately selected to compare the actual and the optimal levels of treatment adherence. The authors included the four most commonly prescribed osteoporosis treatments in Sweden.

Effectiveness/benefits:
No systematic review was reported to identify the clinical inputs, but the epidemiological data were appropriately selected from Swedish registries. The treatment effect was from clinical trials and the natural history of disease was from a large prospective study. These were appropriate study designs for each model parameter. Most of the clinical data were incorporated in a published model. QALYs were an appropriate benefit measure, and they capture the impact of the disease on survival and quality of life, both of which are relevant for patients with osteoporosis. Limited information was provided on the sources used to derive the utility values and on the instruments used to elicit them; it was not clear whose values (patients, experts, or the general population) were used.

Costs:
All costs associated with osteoporosis were included irrespective of who paid them, which was in accordance with the societal perspective, as stated by the authors. The sources are likely to have reflected the Swedish context, but were not fully described. The total cost of each fracture was reported, but the unit costs and resource quantities were not reported separately limiting the reproducibility and the transparency of the analysis. In general, the costs were not varied in the sensitivity analysis. Other details, such as the price year and currency conversion, were provided.

Analysis and results:
The results were extensively presented and were reported for men and women separately, as well as for age subgroups. The uncertainty was partly investigated in sensitivity analyses that considered variations in a few inputs. The authors stated that no discounting was applied to costs and benefits as the study focused on the assessment of the annual burden of disease. Little information on the decision model was provided, as it was based on a published model. The authors stated that the burden of disease might have been underestimated as they focused only on persistence of treatment and not incomplete adherence. The analysis focused on the Sweden, with a high incidence of osteoporotic fractures, and cannot be easily transferred to other settings.

Concluding remarks:
Some key assumptions were made, but the methods were valid and the authors’ conclusions appear to be robust.

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