2011 Masters Thesis

COST EFFECTIVENESS OF ALENDRONATE TO REDUCE HIP FRACTURES FROM OSTEOPOROSIS IN ICELANDIC POSTMENOPAUSAL WOMEN

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Background: In 2001 an assessment tool for predicting fracture risk in postmenopausal women was developed. An index based on a small number of risk factors that are easily assessed was developed called the Fracture Index. The value of this index ranges from 0-13 with higher number associated with higher five year probability of fracture. The magnitude of the morbidity and mortality associated with osteoporosis makes it valuable for health care professionals to know if a treatment to prevent fractures is cost effective or not.

Objective: To investigate at what Fracture Index value it becomes cost effective to treat postmenopausal women with alendronate to prevent hip fractures. The focus is on Icelandic women.

Design: A Markov model was developed to model the disease progression for women 65 years of age to 85 years of age which is the average life expectancy for women in Iceland. Cost effectiveness of alendronate vs. no treatment was assessed by transitioning women in the model every six months between different health states. In the base-case five year treatment with alendronate was assumed.

Results: At Fracture Index 1-2 the incremental cost effectiveness ratio (ICER) was 27,467,073 ISK (238,844$) which is not considered to be cost effective. At Fracture Index 3-4 the ICER was 4,349,251ISK (37,820$) which has a 59% probability of being cost effective if the per capita GDP (4,800,000 ISK) for Iceland is used as a threshold for cost effectiveness. However cost effectiveness for Fracture Index 3-4 depends largely on the assumptions made in the model, some of which are uncertain such as drug cost, drug efficacy and appropriate discount rate. Treatment with Alendronate is cost effective for Fracture Index 5 and variation in the model's assumptions does not change that result.

Conclusions: The results of this study indicate that treating osteoporotic women with alendronate to prevent hip fractures becomes cost effective at Fracture Index 5 with a 1.9% five year probability of hip fracture.