CHARACTERIZING UNCERTAINTY IN EARLY-DEVELOPMENT MUSCULAR-SKELETAL DISORDERS – Cost Studies

MUSCULAR-SKELETAL DISORDERS – Cost Studies

FIRST LINE TREATMENT FOR GOUT

METHODS: We built a decision analytic model as a decision tree using TreeAge Pro 2009, in which allopurinol was compared to febuxostat as a first line treatment for gout. The model examined two time horizons: 1–8 weeks and 9–52 weeks. Treatment success from week 1–8 was defined as no case of gout flare. If a gout flare occurred within the chance of continuing on allopurinol and/or population sizes and vice versa. Budgetary impact modeling often occurs early, amidst uncertainty surrounding the eligible patient population or the final price of a new intervention. Uncertainty can be characterized using per-member per-month (PMPM) iso-curves that graphically depict the net budgetary impact at different prices and population sizes. The objective of this study is to examine the use of PMPM budgetary impact (PMPMBI) iso-curves to represent budgetary uncertainty for products prior to regulatory approval, using denosumab as an example. METHODS: A 3-year Markov cohort budgetary impact model (BIM) was developed for denosumab in the treatment of postmenopausal osteoporosis in a hypothetical US managed care plan. The model incorporates current market shares and persistence on osteoporosis treatments, and calculates the long-term cost of adding denosumab to the health plan. Direct medical costs to the payer include drug costs and medical cost offsets due to reductions in osteoporotic fractures. The model was used to construct PMPMBI iso-curves for each of the 3 model years by systematically varying the price of denosumab and the number of patients receiving treatment while holding all other parameters constant. RESULTS: In year 1, the PMPMBI iso-curves ranged from $0.06 to $0.08 using the lower and upper limits of price and population size assumptions. The lower iso-curves occur at lower prices and/or population sizes and vice versa. Budget impact is insensitive to the size of the uncertainty band. Budget impact is insensitive to the size of the uncertainty band. Budget impact is insensitive to the size of the uncertainty band.

METHODS: In the two arms, we compared the effectiveness and safety of etanercept plus infliximab and adalimumab in patients with active RA who had not previously responded to TNF inhibitors. The primary outcome measure was the ACR20 response rate at 20 weeks. We used a simulation approach to estimate the cost-effectiveness of the two treatment strategies. We used a Markov model to simulate the clinical outcomes of patients with RA. The model was parameterized with data from clinical trials and real-world studies. The model was run for 5 years, with a time horizon of 5 years. The effectiveness of each treatment was measured in terms of the proportion of patients who achieved an ACR20 response at 20 weeks. The costs were estimated from a healthcare perspective, including direct medical costs and indirect costs. The sensitivity analyses were conducted to assess the robustness of the results to variations in key input parameters. The results of the study showed that the cost-effectiveness of etanercept plus infliximab was comparable to that of adalimumab, with similar ACR20 response rates at 20 weeks. The estimated incremental cost-effectiveness ratios were $25,000 per ACR20 response for etanercept plus infliximab compared to $24,000 per ACR20 response for adalimumab. The results were robust to the sensitivity analyses.

CONCLUSIONS: Our study provides evidence that etanercept plus infliximab is a cost-effective treatment option for patients with RA who have failed to respond to previous TNF inhibitors. Further research is needed to validate these findings and to assess the long-term cost-effectiveness of the treatment strategy.