Cost-Effectiveness of New Antiplatelet Therapies

Sarasin FP, Gaspoz JM, Bounameaux H. Cost-effectiveness of new antiplatelet regimens used as secondary prevention of stroke or transient ischemic attack. Arch Intern Med 2000;160:2773–8.

Study Overview

Objective. To determine the marginal cost-effectiveness of clopidogrel and the combination of dipyridamole and aspirin compared with aspirin alone in the secondary prevention of stroke or transient ischemic attack (TIA).

Design. A Markov model was developed and was fed data from previously published studies. The decision analysis took a societal perspective. Researchers used average Medicare reimbursement rates to estimate costs; nursing home costs were not included. One-way sensitivity analyses were performed using a range for all major clinical and economic variables. An annual discount rate of 3% was applied in the base-case analysis.

Setting and participants. The base-case consisted of a group of 65-year-olds who recently suffered a stroke or a TIA. Gender and ethnicity were not specifically considered in the model.

Intervention. The decision model included 3 options for secondary preventive treatment: (1) aspirin, 325 mg per day; (2) aspirin, 50 mg per day, and dipyridamole, 400 mg per day; and (3) clopidogrel bisulfate, 75 mg per day.

Main outcome measure. The main outcome was marginal cost-effectiveness, expressed as U.S. dollars per quality-adjusted life year (QALY).

Main results. Compared with no prophylactic treatment, aspirin, aspirin/dipyridamole, and clopidogrel added 10.8, 11.1, and 11.0 QALYs at a lifetime cost of $44,396, $41,425, and $50,388, respectively. In sensitivity analyses, aspirin/dipyridamole remained more effective and less costly than aspirin alone except in 2 conditions. When the estimate of the combination treatment's effectiveness (for preventing stroke and myocardial infarction) was decreased to 8% and 3%, respectively, from base-case estimates of 24% and 10%, the combination treatment became more costly than aspirin monotherapy (marginal cost-effectiveness compared with aspirin, $15,804 per QALY). Likewise, when the daily cost of combination therapy was increased from a base-case rate of $0.30 per day to $1.20 per day, the marginal cost per QALY was $3630. Marginal cost-effectiveness of clopidogrel compared with aspirin alone varied widely in sensitivity analysis, although clopidogrel never became cost-saving. When the estimate of effectiveness was at the bottom of the range set by investigators and when the cost of clopidogrel was $3.80 per day or more, marginal cost-effectiveness became more than $50,000 per QALY. The marginal cost-effectiveness of clopidogrel approached $50,000 per QALY when the age at which drug therapy began was increased to 80 years.

Conclusion

All 3 therapies assessed in the study appear to be cost-effective in the secondary prevention of stroke and TIA. The combination of aspirin and dipyridamole appears to be the most effective and least expensive option.

Commentary

This carefully designed study evaluated an important question and produced the kind of answer hoped for: the best therapy is the cheapest. The Markov model was well constructed, and Sarasin and colleagues performed extensive sensitivity analyses. As in many modeled studies, the weaknesses in Sarasin et al's work lay in the data that were entered into the model. The authors identified these weaknesses and explained that they examined subgroups from a single study for each comparison with aspirin monotherapy. They also noted that earlier pooled data [1] do not support the European Stroke Prevention Study [2], which was used to estimate the effectiveness of aspirin/dipyridamole compared with aspirin alone. Nevertheless, Sarasin and colleague's results—especially for the combination treatment—were quite robust. Moreover, cost estimates, which were based on Medicare reimbursement rates and did not include nursing home care, were more than likely underestimated, thus leading to a less favorable outcome proportional to the therapy's effectiveness.

Applications for Clinical Practice

A single modeled study based on a few clinical trials must always be suspect; however, this study's results are striking. Individual providers and pharmacy and therapeutic committees should look closely at this study and consider making a

combination of aspirin and dipyridamole the first-line treatment for secondary prevention of stroke and TIA.

References

1. Collaborative overview of randomised trials of antiplatelet therapy—I: Prevention of death, myocardial infarction, and stroke by prolonged antiplatelet therapy in various categories of patients. Antiplatelet Trialists' Collaboration [published erratum appears in BMJ 1994;308:1540]. BMJ 1994;308:81–106.
2. European Stroke Prevention Study. 2. Dipyridamole and acetylsalicylic acid in the secondary prevention of stroke. J Neurol Sci 1996;143:1–13.