

Cost-Effectiveness of the Combined Use of Warfarin and Low-Dose Aspirin versus Warfarin Alone in Egyptian Patients with Aortic Valve Replacements: A Markov Model

Abstract

Background: The combination of antiplatelet and anticoagulant therapy significantly reduces the rate of thromboembolic events in patients with heart valves compared with anticoagulant therapy alone. Cost-effectiveness of this therapy in Egypt, however, has not yet been established. **Objective:** The aim of the present study was to evaluate the cost-effectiveness of the combined use of warfarin and low-dose aspirin (100mg) versus warfarin alone in patients with mechanical aortic heart valve prostheses who began therapy at the age of 50 to 60 years over a 5-year period from the perspective of the medical providers. **Methods:** A cohort Markov process model with five health states (recovery, reoperation, bleeding, thromboembolism, and death) based on Egyptian clinical practice was derived from published sources. The clinical

parameters were derived from meta-analyses of randomized controlled trials of patients with mechanical valve prostheses. The quality of life of the health states was derived using the available published data. Direct medical costs were obtained from four top-rated governmental cardiology hospitals in Egypt. All costs and effects were discounted at 3.5% annually. All costs were converted using the purchasing power parity rate and are reported in US\$ for the financial year of 2013. Results: The total quality-adjusted life-years (QALYs) were estimated to be 1.1616 and 1.1199 for the warfarin plus aspirin group and the warfarin group, respectively, which resulted in a difference of 0.0416 QALYs. The total costs for the warfarin plus aspirin group and the warfarin group were US\$ 307.33 and US\$ 315.25, respectively (the difference was US\$ 7.92), which yielded an incremental cost-effectiveness ratio of 190.38 for the warfarin plus aspirin group. Thus, the combined therapy was dominant. Various one-way sensitivity analyses indicated that probabilities of reoperation and bleeding in the recovery state had the greatest effects on incremental costs. The

model parameters that had the greatest effects on incremental QALYs were the relative risk reduction of death and the utility value in the recovery state. Conclusions: The present study is the first cost-utility analysis to conclude that, from the perspective of Egyptian medical providers, combined therapy is more effective and less costly than warfarin alone for patients with mechanical aortic valve prostheses. For clinicians and patients who choose to focus on minimizing thromboembolic risk, these results suggest that combined therapy offers the best protection. This study helps to inform decisions about the allocation of health care system resources and to achieve better health in the Egyptian population.

Keywords: aortic valve replacement, aspirin, cost-effectiveness, Egypt, warfarin.

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