


Abstract

Cost-effectiveness Analysis of Trastuzumab in the Adjuvant Treatment for Early Breast Cancer in Iran
**Background:** Breast cancer (BC) is the most prevalent cancer among Iranian women. There were 9795 newly diagnosed cases in 2012, and a recent studies reported an age standardized incidence rate of 28.1 per 100,000 females in 2012. Human epidermal growth factor receptor-2 is over expressed in 25 to 30 percent of patients with primary breast cancer and it causes cancer cells to reproduce uncontrollably. Evidence from randomized controlled trials (RCTs) has shown a significant survival advantage of trastuzumab. Although extant work in developed countries examined economic evaluation of trastuzumab in adjuvant treatment for early breast cancer based on the 1-year treatment, there is uncertainty about cost-effectiveness of trastuzumab in the Adjuvant Treatment of early breast cancer in developing countries. This study aimed to estimate cost-effectiveness of adjuvant trastuzumab therapy compared to AC-T regimen in early breast cancer in Iran.

**Methods:** A cost-effectiveness analysis was performed using a Markov model to estimate outcomes and costs over a 20-year time period using a cohort of women with HER2 positive early breast cancer, treated with or without 12 months trastuzumab adjuvant chemotherapy. Transition probabilities were derived mainly from the BCIRG006 trial. Costs were estimated from the perspective of the Iranian health care system. Both costs and outcomes were discounted by 3%.

**Results:** On the basis of BCIRG006 trial, our model showed that adjuvant trastuzumab treatment in early breast cancer, yield 0.9 quality-adjusted life-years (QALY) compared with AC-T regimen. Adjuvant trastuzumab treatment yielded an incremental cost-effectiveness ratio (ICER) of 806117895 Rials per QALY.

**Discussion:** In developed countries, 1-year adjuvant trastuzumab treatment is cost-effective in early breast cancer treatment, particularly in a long-term perspective. This costly adjuvant treatment in early breast cancer reduces risk of metastasis disease and improves overall survival. In developing countries, however, there is some uncertainty about the cost–effectiveness of this regimen. High cost–effectiveness ratio yielded in our study is comparable with similar studies. We believe that the main reason for the high cost-effectiveness ratio in our analysis, compared to the similar studies in other settings, is lower treatment costs for metastases state. Some part of the lower costs, compared with developed countries settings, can be explained by the subsidized health care system and also lower cost of services in Iran. Trastuzumab remained a cost-effective treatment strategy in developed countries with a high willingness-to-pay threshold. Willingness-to-pay and acceptable threshold in developing countries such as Iran has not been determined yet. This threshold in Iran would be lower than developed countries.

**Conclusion:** By using threshold of 3 times GDP per capita, as per World Health Organization (WHO) recommendation, 12 months trastuzumab adjuvant chemotherapy is not a cost-effective therapy for patients with HER2-positive breast cancer in Iran.

**Key Word:** adjuvant therapy; cost-effectiveness; early breast cancer; trastuzumab