Cost-Effectiveness Analysis of Adjuvant Hormonal Treatments for Women with Postmenopausal Hormone-Receptor Positive Early Breast Cancer in the Korean Context

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HyeJae Lee1, Tae-Jin Lee1, Bong-Min Yang1; 1. Seoul National University, Graduate School of Public Health

Background
- Breast cancer is the most common cancer among women in South Korea. A total of 11.2% of women were newly diagnosed with breast cancer in 2006 and the age-standardized incidence rate per 100,000 was 35.5. (1)
- Anastrozole and Letrozole are the third generation aromatase inhibitors, and they have been demonstrated to be more effective than tamoxifen as the first-line treatment for early breast cancer.
- Anastrozole has shown more favorable disease-free survival (hazard ratio [HR], 0.83; 95% confidence interval [CI], 0.73-0.95; p=0.005) and a longer time to recurrence (HR, 0.74; 95% CI, 0.64-0.87; p<0.0002) versus tamoxifen on the completed treatment analysis of the ATAC trial, which was performed in postmenopausal women with breast cancer. (3)
- In the primary core analysis of the BIG 1-98 trial at a median follow-up of 25.8 months, letrozole significantly improved the DFS by 18% (HR, 0.81; 95% CI, 0.70-0.93; p=0.003), and it reduced the risk of breast cancer recurrence by 28% (HR, 0.72; 95% CI, 0.61-0.86; p<0.0003). (4)
- The purpose of this study is to address the cost-effectiveness of 2 aromatase inhibitors, anastrozole and letrozole, versus tamoxifen when they are used to treat women with postmenopausal hormone receptor positive early breast cancer in the Korean context.
- Moreover, this study aims to find the most reasonable treatment option among the node positive patients and node negative patients, when the population is stratified by the risk of recurrence.

Structure of the Economic Model and Model Estimations

Results – Incremental Cost-effectiveness Ratio and Subgroup Analysis

Overall population
- In the first model, which analyzed anastrozole versus tamoxifen, the discounted QALY were shown as 11.36 and 11.13, respectively, while the discounted lifetime cost of anastrozole and tamoxifen were KRW 14,445,950 and KRW 9,260,152, respectively. (Tab. 6)
- In the second model where letrozole and tamoxifen were analyzed, the discounted QALY were shown as 11.37 and 11.08, respectively, while the discounted lifetime cost of letrozole and tamoxifen were KRW 15,404,239 and KRW 9,419,457, respectively. (Tab. 6)

Sensitivity analysis
- The cost-effectiveness was sensitive to the reduction of price of aromatase inhibitors.
- The cost-effectiveness was relatively sensitive to the probability of death due to distant recurrence, the costs of death from breast cancer, the RR of hip fracture for aromatase inhibitors versus tamoxifen and the discount rate.
- The sensitivity analysis showed that the results of base-case analysis were robust (Fig. 2).

Subgroup analysis
- In the node negative group, anastrozole was the most cost-effective with an incremental cost of KRW 19,717,770 per QALY. Letrozole was the most cost-effective with an incremental cost of KRW 8,150,512 per QALY for the node positive group.

Conclusion

The implication of this study is that the decision makers should be careful when generalizing the cost-effectiveness results. The stratified analysis in this context may help reach a reasonable decision for allocating medical resources.