Health technology assessment: case study on breast carcinoma treatment in the Czech Republic

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Abstract

This thesis proposes an original method for assessing total costs of medical treatment. It defines the semi-Markov model with four states that are associated with specific costs of the treatment, and not with patients' health statuses. This method is applied to individuals' treatment data drawn from the Czech clinical practice in the treatment of the metastatic HER2+ breast cancer.

The aim is to assess the cost-effectiveness of adding medication pertuzumab to the combination of trastuzumab+docetaxel within first-line therapy and to examine whether using individual data on Czech patients and the economic conditions leads to different results from foreign studies. Furthermore, employing censored data from the clinical practice in the thesis complicates the estimation of patients' overall survival in comparison to clinical-trials data that form random samples. Therefore, survival functions were not only estimated by the Kaplan-Meier estimator but also using the Cox proportional hazard model and the Accelerated failure time model that both control for the effects of included covariates.

The addition of pertuzumab does not result in significantly longer patients' survival based on the employed data. Since the treatment is associated with higher costs, adding pertuzumab is not considered to be cost-effective. This discrepancy from the results of the international clinical trial CLEOPATRA could be attributed to dissimilar patients' length of follow-up.