

## Adjuvant Chemotherapy Prognostic Programs Adjuvant! Online and Predict: Their Suitability for BRCA1-associated Breast Cancer Patients

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**Introduction.** BRCA1-associated breast cancer is considered a unique clinical entity with its own specific histopathological characteristics. Several recently published large studies have shown that overall survival of BRCA1 mutation carriers having breast cancer is similar to sporadic breast cancer patients. It was also suggested that better response to chemotherapy is one of the most important factors that improves the clinical outcome of breast cancers with unfavourable histopathological subtypes in BRCA1 mutation carriers.

Adjuvant! Online and PREDICT are web-based tools that estimate the survival benefit of adjuvant chemotherapy in primary breast cancer patients. These tools have been extensively validated in different populations; however, the accuracy of the predictions made by Adjuvant! Online and PREDICT among BRCA1 mutation carriers has not yet been investigated.

**Materials and methods.** The study population comprised 93 breast cancer patients who had been identified as BRCA1 mutation carriers during genetic screening at the Oncology Institute of Rīga Stradiņš University in Riga, Latvia. Clinical and histopathological information from medical records was used as input data for the Adjuvant! Online and PREDICT programs to obtain the predicted 10-year survival probabilities. The predicted 10-year overall and breast cancer specific survival rates were then compared with 10-year survival percentages observed in the study population.

**Results.** Predictions of overall survival (OS) and breast cancer-specific survival (BCSS) obtained from Adjuvant! Online and PREDICT were significantly lower than the observed survival percentages in the study population (predicted - observed difference for OS: - 13.85%, 95% CI = -17.29 to -10.41,  $p < 0.0001$ ; and for BCSS: -14.73%, 95% CI = -17.89 to -11.57,  $p < 0.0001$ ). The most significant differences between the predicted and observed survival rates were found among the patients with estrogen receptor negative, grade 3 and ductal tumour subtypes.

**Conclusions.** The results of this study suggest that adjuvant chemotherapy prognostic programs Adjuvant! Online and PREDICT should be used with caution in BRCA1-associated breast cancer patients. Further updating of adjuvant therapy benefit calculation tools by inclusion of the information about inherited genetic alterations should be considered to improve the performance of these tools among hereditary breast cancer patients.