

Clinical Treatment Score post-5 years (CTS5) as a Tool for Risk Estimation of Late Recurrence in Thai Patients with Estrogen Receptor Positive, Early Breast Cancer : A Validation study

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Background: The rate of late distant recurrence of hormonal receptor (HR) positive breast cancer continued steadily even after 5 years of endocrine treatment. Clinical Treatment Score post-5 years (CTS5) was developed and validated as a tool to assess the risk of late distant relapse (LDR) using data from ATAC and BIG1-98. This study aimed to externally validate CTS5 in a real-world cohort of HR positive breast cancer patients diagnosed and treated at an academic center in Thailand.

Methods: This is a retrospective analytical research of early-stage, HR positive breast cancer patients, who completed 4.5-5.5 years of adjuvant endocrine therapy without recurrence. Primary endpoint was late distant relapse. The risk of LDR was determined using CTS5 calculator. Cox regression model and Kaplan-Meier survival analysis were applied for prognostic validation of CTS5. Calibration was performed by comparing the observed to expected LDR using Hosmer-Lemeshow test (H-L)

Results: A total of 323 women were included in the analysis with a median follow-up of 11.6 years. The average age is 51 years old; 54.2% were post-menopausal and over 2/3 received adjuvant chemotherapy. Rate of LDR events was 10.8%. According to CTS5, 48% were categorized as low-risk, 28.5% as intermediate-risk, and 23.5% as high-risk for LDR. The CTS5 was prognostic for LDR in our population with HR of 2.1 (log-rank, $p < 0.001$) for each unit increase in score and a significant difference in LDR between intermediate and high-risk groups compared to low risk group. C-index of the area under ROC curve was 0.672 for entire cohort, 0.72 in post-menopausal group and 0.62 in pre- menopausal group There was no significant difference between actual and expected number of LDR events with O/E ratio of 0.99 (0.86-1.12) (H-L $p = 0.79$) indicating a proper calibration in this cohort of patients.

Conclusions: Our study validated that CTS5 is accurate in predicting the risk of LDR in HR positive breast cancer in Thai patients. Its performance seemed to be better in post-menopausal patients. CTS5 could be applied to routine clinical practice to compliment the decision toward prolonged endocrine therapy in intermediate and high-risk patients.
