Circulating Tumor Cells May Predict Prognosis in Patients with Metastatic Breast Cancer

A simple blood test can reveal treatment response faster than conventional imaging scans.

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Circulating Tumor Cell Dynamics May Predict Treatment Response and Prognosis in Patients with Metastatic Breast Cancer

Early circulating tumor cell dynamics were associated with overall survival in patients with metastatic breast cancer, according to a meta-analysis presented at the 2020 San Antonio Breast Cancer Symposium, held Dec. 8-11.

“With the increasing number of treatment options available to patients with metastatic breast cancer, being able to predict and monitor treatment responses rapidly will be critical to aiding treatment decisions,” said Wolfgang Janni, MD, PhD, a professor and director of the women’s clinic at Ulm University Hospital in Ulm, Germany.

Responses to breast cancer treatment are typically monitored by conventional imaging, but this method requires time—approximately three months, depending on the subtype—before changes can be detected, Janni explained. “We were interested in determining whether treatment response and prognosis could be predicted earlier using a simple blood test.”

In this study, Janni and colleagues investigated the potential of circulating tumor cells (CTCs), which are shed from the primary tumor into the bloodstream, to predict overall survival. They analyzed global pooled datasets from peer-reviewed and published studies of 4,079 patients with metastatic breast cancer, all of whom had undergone baseline and follow-up CTC measurements using the CellSearch test. The median time from baseline to follow-up was 29 days. Changes in CTC levels between baseline and follow-up were analyzed to determine whether they were associated with overall survival.

Of the 2,961 patients who were CTC-positive at baseline, 1,855 remained CTC-positive after initiating treatment (positive/positive), and 1,106 patients had converted to CTC-negative (positive/negative). Of the 1,118 patients who were CTC-negative at baseline, 813 remained CTC-negative (negative/negative), while 305 had become CTC-positive (negative/positive).

Median overall survival was greatest for patients who were negative/negative (47 months), followed by positive/negative (32.2 months), negative/positive (29.67 months), and positive/positive (17.87 months). Compared to patients who were negative/negative, the risk of death was 215 percent greater for those who were positive/positive, 74 percent greater for negative/positive, and 52 percent greater for positive/negative. For patients who were CTC-positive at baseline, those who remained CTC-positive at follow-up had a 51 percent greater risk of death than those who converted to CTC-negative.

Similar trends were found when CTC dynamics were analyzed by breast cancer subtype, including for hormone receptor-positive, HER2-positive, and triple-negative breast cancers. CTC dynamics were associated with overall survival for all breast cancer subtypes.

“These data indicate that CTC dynamics can predict the trajectory of the disease a little more than four weeks after initiating treatment,” said Janni. “This provides an advantage over conventional imaging methods and can help physicians determine very early on whether a treatment should be continued. It is also very reassuring that CTC dynamics predicted outcomes for all breast cancer subtypes.”

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A limitation of the study is that information about the type of treatment received was not available for many patients. “A strength of our study is that we have individual patient data from around the world, but this is also a limitation because different sources provided varying levels of details regarding treatment,” Janni explained. The absence of these data precluded determining whether the predictive value of CTC dynamics varies by treatment.

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