

Survival in metastatic breast cancer directly linked to circulating tumor cells

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A new study of metastatic breast cancer shows that the number of circulating tumor cells patients have in their blood directly correlates with the length of their survival. Reported at the IMPAKT Breast Cancer Conference in Brussels, Belgium, the results have the potential to improve the delivery of personalized therapy to these patients.

Circulating tumor cells --cancer cells found in a patient's bloodstream-- are detected in 50% to 80% of patients with metastatic [breast cancer](#). Since 2004, doctors have known that patients with 5 or more of these cells in 7.5 ml of blood survive on average for less time than those with fewer than 5 cells.

Dr Antonio Giordano from MD Anderson Cancer Center in Houston, USA, and colleagues set out to refine this prognostic test using a sophisticated computer model known as an artificial neural network.

"We chose to use an artificial neural network model to analyze 516 consecutive [metastatic breast cancer](#) patients at the University of Texas MD Anderson Cancer Center because, unlike more typical statistical methods, it can estimate the complex interactions between different factors over time," said Dr Giordano. "Our model, designed at the University of Naples Federico II, simply represents a dynamic time-related analysis of survival, taking into account all prognostic factor correlations."

Using the [artificial neural network](#), the researchers studied the

relationship between increasing numbers of [circulating tumor cells](#) and survival for different subgroups of breast cancer.

"We found that there was a linear relationship between the number of circulating tumor cells and the risk of death in patients with metastatic breast cancer. Most importantly, the risk of death after 1 year for patients with 40 circulating tumor cells in 7.5 ml of blood was about twice that for patients with none."

"These results show that the simple cutoff number of 5 circulating tumor cells probably does not adequately represent the complexity of this prognostic variable," Dr Giordano said. "Artificial neural networks are sophisticated techniques for analyzing survival of patients according to continuous variables over time."

Translated to clinical practice, these results suggest that monitoring of circulating tumor cell numbers should now be considered a standard test for patients with metastatic breast cancer, Dr Giordano said.

"While the treatment of this condition remains palliative, monitoring of circulating tumor cells can help determine when to modify regimens or discontinue therapy, in other words, this can improve the delivery of personalized therapy."

Provided by European Society for Medical Oncology

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