Persistence of HER2-overexpression on circulating tumor cells (CTC) in patients after systemic treatment for HER2-positive breast cancer – Follow up results of the German SUCCESS B trial


1) Department of Gynecology and Obstetrics, Ludwig-Maximilians-University, Munich, Germany; 2) University Hospital Ulm, Germany; 3) University Hospital Erlangen, Germany; 4) Klinikum Brremen-West/Reinhardshöhe, Germany; 5) Krankenanstalten Mutterhaus der Borromäerinnen, Trier, Germany; 6) Klinikum Ludwigshafen, Germany; 7) Gynäkologisch-onkologische Schwerpunktpraxis, Fürstenwalde, Germany; 8) Klinikum Schwäbisch Gmünd, Mutlangen, Germany; 9) National Center for Tumor Diseases, University Hospital Heidelberg, Germany; 10) Institute for Tumor Biology, Center of experimental medicine, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

Background
The discordance between HER2-expression on circulating tumor cells (CTC) in peripheral blood and the primary tumor has already been shown by our study group for early breast cancer patients with HER2-positive tumors. Here, we compare the results to CTC prevalence and Her2-status of CTC after adjuvant chemotherapy.

Materials & Methods
We prospectively analyzed 23ml peripheral blood before and 28 days after chemotherapy. CTC and HER2-status were assessed with the CellSearchSystem (Veridex, USA). After immunomagnetic enrichment with an anti-Epcam-antibody, cells were labeled with anti-Cytokeratin 8/18/19, anti-CD45 antibodies and a fluorescein conjugate antibody for HER2-phenotyping. Cutoff for CTC positivity was ≥ 1 CTC. HER2-positivity of CTC was assigned if at least one CTC showed strong HER2 staining (3+).

Results
Valid data on CTC and their HER2-status both before and after chemotherapy were available for 392 patients. In 179 (45.7%) patients no CTC were detected before and after chemotherapy. CTC status changed from positive to negative after chemotherapy in 104 (26.5%) patients and from negative to positive before to positive after chemotherapy in 69 (17.6%) patients, while 40 (10.2%) patients had a consistently positive CTC status.

Patients were significantly more likely to change their CTC status from positive to negative than from negative to positive (McNemar test for related samples, p = 0.01). Of the 40 patients with CTC both before and after chemotherapy, 14 (35%) patients had HER2-positive CTC before and after therapy, and 9 (22%) patients had HER2-negative CTC at both time points. 7 (18%) patients had HER2-positive CTC before but not after chemotherapy, while 10 (25%) patients showed the reverse pattern (McNemar test, p = 0.63).

Conc lusion
Cytotoxic treatment does not seem to influence the HER2-status on CTC. Follow up data within the Success B trial will analyze the relevance of the HER2-expression of CTC to predict the efficacy of targeted treatment.

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