

The Effect of Blood Selenium Level on the pCR Rate in Breast Cancer Patients Receiving Neoadjuvant Chemotherapy

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Abstract:

Purpose Among patients treated with neoadjuvant chemotherapy (NAC), a high survival rate is observed for those who experience a pathological complete response (pCR). Various tumour factors are predictive of a pCR, but few host factors have been studied. We sought to inquire whether or not a patient's blood selenium level prior to treatment was predictive of a pCR.

Methods We studied 329 women diagnosed with primary invasive breast who were treated with neoadjuvant chemotherapy (NAC). We included patients with HER2-positive breast cancer (n = 183) or triple-negative breast cancer (n = 146). Blood was collected before the initiation of treatment. Serum blood levels of selenium were quantified by mass spectroscopy. Each patient was assigned to one of three tertiles based on the distribution of blood selenium levels in the entire cohort. Patients with triple negative breast cancer (TNBC) were treated with a range of combination chemotherapies. Patients with HER2-positive breast cancer received anti-HER2 treatment based on trastuzumab alone or trastuzumab and pertuzamab. After treatment, each patient was classified as having pCR or no pCR

Results In the entire cohort, the pCR rate was 59.0% for women in the highest tertile of blood selenium, ($\geq 107.19 \mu\text{g/L}$) compared to 39.0% for women in the lowest tertile ($\leq 94.19 \mu\text{g/L}$) ($p = 0.003$).

Conclusions A high selenium level is predictive of pathological complete response in women treated for HER2-positive or triple-negative breast cancer. If confirmed, this observation may lead to a study investigating if selenium supplementation improves pCR rates (and survival) in breast cancer patients receiving NAC.