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Increased mean corpuscular volume of erythrocytes during capecitabine treatment: a simple surrogate marker for clinical response

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ABSTRACT

Aims and background. Capecitabine, as all fluoropyrimidines, interferes with vitamin metabolism and may thus have an impact on hematopoiesis. It is metabolized to its active form 5-fluoruracil by the enzyme thymidine phosphorylase, which exists in higher concentrations in tumor tissue and liver than in normal tissues. In the study, we investigated the changes in mean corpuscular volume (MCV) of red blood cells and the possible correlation of these changes with the clinical outcome of capecitabine treatment in women with metastatic breast cancer.

Methods and study design. Data from 75 metastatic breast cancer patients were analyzed retrospectively. Capecitabine was used at a dose of 2500 mg/m² daily for 14 days of every 3-week period. Mean corpuscular volume of red blood cells and other parameters of complete blood count were recorded at the beginning of the treatment, in the ninth week, and periodically thereafter.

Results. Mean age was 51.5 ± 10.8 and 61.3% of the patients were premenopausal. Capecitabine was administered as the median 3rd line (min-max: 1-9) treatment and a median of 6 cycles (min-max: 1-24) for metastatic breast cancer. Median ΔMCV level (post-treatment values at ninth week - baseline) was 8. ΔMCV was ≥8 in 37 patients and <8 in 38 patients. The 35 of the 37 patients with ΔMCV level ≥8 and 25 of the 38 patients with ΔMCV level <8 had clinical benefit (complete response + partial response + stable disease) from capecitabine treatment ($P = 0.02$). However, the difference between progression-free survival of the patients with ΔMCV levels higher than 8 and those with ΔMCV levels lower than 8 according to Kaplan-Meier survival analysis was not statistically significant (6.7 and 4.3 months, respectively, $P = 0.26$). Additionally, median ΔMCV level was 9.1 (min-max: -2.4 to 24.9) among patients who had clinical benefit and 5.90 (min-max: -0.8 to 12.3) among nonresponders ($P = 0.016$).

Conclusions. Capecitabine increases the mean corpuscular volume levels of red blood cells by a yet unidentified mechanism. Early increment of mean corpuscular volume levels is higher than 8, i.e. by the 9th week, might predict clinical benefit from the treatment.

Key words: breast cancer, capecitabine, corpuscular volume, erythrocyte mean response marker.

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