



ABCB1(P-glycoprotein) and TOP2A as predictive markers for anthracycline and taxane-containing chemotherapy regimens in neoadjuvant treatment of breast cancer

Aliiev J.A.,¹ Rahimzade S.E.,¹ Kazimov E.E.¹

National Center of Oncology,¹ Baku, Azerbaijan

Background: Topoisomerase II alpha (TOP2A) and ABCB1 protein has been shown to be a proliferation marker associated with tumor grade and Ki67 index. The predictive significance of TOP2A and ABCB1 together seems different among different subtypes of breast cancer. Our study evaluated the predictive impact of TOP2A and ABCB1 protein on breast cancer patients to whom prescribed neoadjuvant chemotherapy.

Keywords: Breast cancer, Predictive factor, topoisomerase II alpha, ABCB1/ P-glycoprotein.

Method: Altogether 43 stage II-III breast cancer patients who underwent surgery after neoadjuvant chemotherapy in National Center of Oncology between 2017 and 2019 were enrolled. There was carried out 4AC+4T chemotherapy protocol to all patients. TOP2A and ABCB1 expression was assessed in tumor tissues of patients at Molecular Oncology Laboratory using the RT-PCR method, a sample from malignant tumor tissue was compared with the level of expression of the same gene isolated from normal tissue. In this case, the “delta 2” comparison method had been used. Clinical and pathological data were retrospectively collected. There was made correlation between all results TOP2A, ABCB1, CA15-3, ki-67, tumor grade and with pathologic response rate.

Result: The 15 patients were classified as TOP2A overexpression. TOP2A overexpression was associated with a higher tumor grade, CA-15-3 and Ki-67 index. ABCB1 (MDR1 or P-glycoprotein) overexpression was detected in 11 patients and were not associated with other factors. Patients with TOP2A high expression and ABCB1 no mutation showed a

significantly higher pathological response rate (DWORAK III-IV) compared with patients with low TOP2A expression.

Patients with only ABCB1 higher expression showed low tumor response rate (I-II). The predictive influence of TOP2A expression was more significant in ABCB1 negative, ER+, Her-2 negative patients regardless of the CA 15-3 and Ki-67 level. Multivariate analysis revealed TOP2A negative+ABCB1 overexpression was an independent factor for worse tumor response rate and complete response in neoadjuvant chemotherapy receiving breast cancer patients.

Conclusion: ABCB1 and TOP2A expression showed an influence on stage II-III breast cancer, suggesting they might be a potential predictor of regression rate in neoadjuvant chemotherapy for this group of patients.