Better Prognosis for *BRCA1* Mutation Carriers among Triple-Negative Breast Cancers

Jelena Maksimenko, Arvids Irmejs, Genadijs Trofimovics [1]**,**
Edvins Miklasevics

Rīga Stradiņš University, Oncology Institute, Latvia
[1] *Rīga Stradiņš University, Latvia*

Introduction. Approximately 57–88% of all *BRCA1*-related tumours are TNBC. It has been proposed that TNBC and *BRCA1*-related breast cancer show some similar gene expression patterns and clinicopathological features. Nevertheless, conflicting data about prognostic significance of carrying a *BRCA1* mutation in patients with TNBC exist.

The aim. The aim of the study is to investigate the prognostic significance of carrying a germline *BRCA1* founder mutation in patients with TNBC.

Materials and methods. A total of 116 patients were included in the study, 38 *BRCA1* mutation positive patients with invasive TNBC in stages I–IV diagnosed and operated between 2005–2011 were identified from the database of Rīga Stradiņš University Oncology Institute. In the control group, 78 consecutive invasive triple-negative *BRCA1* mutation – negative breast cancer patients in stages I–IV diagnosed and operated between 2005–2011 in Pauls Stradins Clinical University Hospital were included. Patients with accompanying ovarian cancer or other cancers in advanced stages were not included in the study. Clinical data of all patients from medical records were retrospectively analyzed. All patients were tested for the two common founder mutations in *BRCA1* (*4153delA and 5382insC*) in Latvia using a multiplex-specific polymerase chain reaction (PCR) assay. The study was approved by the Ethics Committee of Rīga Stradiņš University.

Results. *BRCA1* mutation carriers were significantly younger at diagnosis than non-carriers (median age, 48.8 years versus 54.4 years, respectively; $p < 0.034$). There were no statistically significant differences in relation to tumour size, T stage, stage, ki-67 status and tumour differentiation grade between the two groups. Invasive ductal carcinoma was the most common histological type in both groups, but *BRCA1* mutation non-carriers were more likely to have invasive lobular carcinomas. All patients underwent definitive surgery. The types of chemotherapy received and postoperative radiotherapy were at the discretion of the multidisciplinary treating team. There was a higher proportion of lymph node negative patients in the *BRCA1* mutation carriers group ($p < 0.004$), but there were no differences in performed lymphadenectomy and sentinel node biopsy between the two groups. A higher proportion of *BRCA1* mutation carriers experienced mastectomy ($p < 0.001$). There were no statistically significant differences between the two groups in the received chemotherapy. *BRCA1* mutation non-carriers more likely received radiation therapy ($p < 0.027$). There was no statistically significant difference in the locoregional recurrence rate between *BRCA1* mutation carriers and non-carriers ($p = 0.8$). A higher proportion of distant recurrence experienced *BRCA1* mutation non-carriers compared with mutation carriers 20 (25.6%) versus 3 (7.9%), respectively; $p < 0.02$). *BRCA1* mutation non-carriers were more likely to die from breast cancer than *BRCA1* mutation carriers ($p = 0.014$). *BRCA1* mutation carriers had a statistically significant higher breast cancer – specific survival than non-carriers ($p < 0.02$).

Conclusion. Our study results suggest that TNBC *BRCA1* mutation carriers with no evidence of ovarian or other cancer type in advanced stage have a significantly better prognosis than TNBC *BRCA1* mutation non-carriers.