Clinical Significance of Sporadic *TP53* Mutations in the Triple-negative Breast Cancer Group

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Introduction. In previous studies, a strong relationship between *BRCA1* mutation-associated tumours, triple-negative breast cancers and *TP53* mutations has been demonstrated. However, inconsistent and limited data are available regardless the prognostic implication of *TP53* sporadic mutations in the triple-negative breast cancer subgroup.

Aim. The aim of the study is to investigate the prognostic significance of the *TP53* mutations in patients with triple-negative breast cancer.

Material and methods. A total of 66 primary triple-negative breast tumours were retrospectively screened for mutations in *TP53* exons 5 to 8, using real-time PCR with subsequent HRM and direct bi-directionally DNA sequencing performed for mutation-positive specimens. The correlation between somatic *TP53* mutations and clinical outcomes were analysed.

Results. In total of 26 tumours with at least one *TP53* sporadic mutation, 33 different *TP53* mutations (27 (81.8%) point mutations, 5 (15.2%) deletions, 1 (3%) insertion) were detected. There was no statistically significant difference in the *TP53* mutations rate between triple-negative *BRCA1* mutation non-carriers and carriers (22 (40%) versus 4 (36.4%), respectively; $p = 0.84$). There was no statistically significant difference between *TP53* mutation carriers and non-carriers in relation to median age at diagnosis, the size of the tumour, histology, grade, ki-67 expression, T stage, lymph node status, stage of the disease, received surgery and chemotherapy regimens. There was no significant difference in the LRR rate between triple-negative *TP53* mutation positive and negative group ($p = 0.87$). Deleterious *TP53* mutations were associated with statistically significant negative impact on distant-recurrence-free survival (63.6% versus 85.0%, respectively; $p < 0.036$). *TP53* deleterious mutations showed no statistically significant prognostic impact on breast cancer-specific survival. However, there was a tendency towards a worse breast cancer-specific survival in the triple-negative *TP53* deleterious mutations positive group compared to negative group (80% versus 77.3%; $p = 0.65$).

Conclusion. The evidence of the study suggests that sporadic deleterious *TP53* mutations could be used as a prognostic factor of a worse distant recurrence-free *surv*ival in the triple-negative breast cancer group.

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