

The Impact of BRCA Mutation on the Efficacy of Neoadjuvant Chemotherapy in Advanced Ovarian Cancer

Ana Maria Popa, Horia Teodor Cotan, Cristian I. Iaciu, Cornelia Nitipir

Department of Oncology, Elias University Emergency Hospital, Bucharest, Romania

Department of Oncology, Carol Davila University of Medicine and Pharmacy, Bucharest, Romania

Abstract

Objective: this retrospective study aimed to evaluate the impact of BRCA mutational status on the outcomes of patients with advanced ovarian cancer treated with either primary debulking surgery (PDS) or neoadjuvant chemotherapy followed by interval debulking surgery (NACT-IDS).

Material and Methods: a total of 79 patients with stage III-IV ovarian cancer treated at Elias Emergency University Hospital between January 2014 and March 2024 were included. Patients received either PDS followed by chemotherapy or NACT-IDS. Clinical and pathological characteristics, progression-free survival (PFS), and overall survival (OS) were analyzed and stratified by BRCA mutational status. Kaplan-Meier analysis and Cox proportional hazard models were used to compare survival outcomes between BRCA-mutated (BRCAmut) and BRCA wild-type (BRCAwt) patients across treatment groups.

Results: the BRCAwt group showed a slight trend favoring PDS in terms of OS (48 months vs. 38 months, $p = 0.03$) and PFS (22 months vs. 19 months, $p = 0.552$), though the difference in PFS was not statistically significant. In contrast, BRCAmut patients treated with NACT-IDS demonstrated significantly improved OS compared to those undergoing PDS (71 months vs. 50 months, $p = 0.043$), while PFS was similar between groups (25 months vs. 23 months, $p = 0.345$). Complete cytoreduction (R0) was achieved in a higher proportion of BRCAmut patients (80.8% vs. 56.6% in BRCAwt).

Conclusion: BRCA mutational status is a critical factor influencing survival outcomes in advanced ovarian cancer. While BRCAwt patients may slightly benefit from PDS, BRCAmut patients exhibit significantly improved OS with NACT-IDS. These findings support the need for individualized treatment strategies based on BRCA status to optimize outcomes in ovarian cancer.

Key words: high-grade serous ovarian cancer, BRCA 1/2 mutation, neoadjuvant chemotherapy, interval debulking surgery, overall survival