Abstract

Impact of Poly(ADP-Ribose) Polymerase (PARP) and Immune Checkpoint Inhibitor Combinations on the Viability of Triple-Negative Breast Cancer Cells †

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Background: Breast cancer is one of the most common cancer types and the second most frequent one among women in the United States. Race plays a key role in the prevalence and prognosis of breast cancer, specifically in triple-negative breast cancer, with African American women being highly prevalent compared to white women. Material and Methods: MDA-MB-453 and 231 cell lines were cultured in RPMI-1640 media with 10% FBS. Upon 70–80% confluency, cells were treated with doxorubicin (2 μM for MDA-MB-453 and 1 μM for MDA-MB-231). After 24 h, sensitized cells were treated with inhibitors (Olaparib, O; Niraparib, N; Atezolizumab, A; durvalumab, D; and Pembrolizumab, P) alone as well as with different combinations at a concentration of 100 μM. The drug combinations include: O + N, O + A, O + D, O + P, N + A, N + D, N + P, D + A, A + P, and P + D. Statistical analysis was performed between the treatment groups using the one-way ANOVA. Results: Our results showed that MDA-MB-453 cells treated with the combinations O + N, O + A, O + D, N + A, N + D, N + P, and A + P showed a significant change in viability compared to the doxorubicin-treated group. Results showed that MDA-MB-231 cells, treated with the combinations O + N, O + D, N + A, N + D, N + P, A + P, and D + A, showed a significant change in viability compared to the doxorubicin-treated group. Conclusions: These findings indicate that the inclusion of these inhibitors, along with the chemotherapeutic drug, not only significantly affects the cell viability of breast cancer cells but also may be helpful in the better therapeutic regime and patient prognosis.

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