https://doi.org/10.29289/259453942024V34S1034

Does the intrinsic chemoresistance profile modulate the efficacy of neoadjuvant chemotherapy in breast cancer patients?

Martina Lichtenfels[1], Alessandra Borba Anton de Souza[2], Bianca Silva Marques[3], Francine Hickmann Nyland[3], Júlia Caroline Marcolin[1], Caroline Brunetto de Farias[1], Antônio Luiz Frasson[2], José Luiz Pedrini[3]

[1]Translational Research, Ziel Biosciences.
[2]Pontifícia Universidade Católica do Rio Grande do Sul, Hospital São Lucas, Breast Service.
[3]Mastology Service of Grupo Hospitalar Conceição.

Objective: This study aimed to validate the efficacy of an *in vitro* chemoresistance platform, BioversoÒ, to demonstrate tumor resistance in breast cancer (BC) patients with partial response to neoadjuvant chemotherapy (NACT). **Methodology:** Patients with primary invasive BC and who presented residual disease (RD) after NACT were included. Fresh tumor samples were collected during biopsy or surgery and dissociated to obtain the tumor cells. The tumor cells were cultured in the BioversoÒ, with eight cytotoxic drugs, and after 72 h, cell viability was evaluated. The test result is defined as low, medium, and high resistance. **Results:** Seven primary tumors and 26 RD after NACT were tested in the chemoresistance platform. Of the RD cohort, 42.3% exhibited triple-negative BC (TNBC) followed by 30.7% of Luminal. A predominant fraction (61.5%) had received a regimen of doxorubicin, cyclophosphamide, and paclitaxel. A marked high resistance was observed across all tested drugs (mean of high resistance: 88% taxanes, 51% anthracyclines, 72% platins, 27% cyclophosphamide, and 67% gemcitabine). Of these patients, 11.5% experienced local recurrence, 23% developed metastases, and 3 (11.5%) patients died from disease progression. We also tested seven primary tumors that were referred to NACT. One (14.3%) achieved pathological complete response (pCR), one (14.3%) had downstaging with residual microinvasion, and five (71.4%) exhibited a poor response. In the chemoresistance platform, the tumors with poor response to NACT presented higher rates of medium-high resistance to the administered drugs. Indeed, they also have a more resistant profile for the eight cytotoxic drugs tested. **Conclusion:** The preliminary finding highlighted the efficacy of BioversoÒ, in demonstrating distinct drug resistance patterns in BC, suggesting a role of intrinsic resistance in the suboptimal response to NACT that could influence the worse prognosis of patients.

Keywords: breast neoplasms; neoadjuvant chemotherapy; drug therapy; residual neoplasms; drug resistance.