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28560 – THE ROLE OF TUMOR RESISTANCE IN NEOADJUVANT CHEMOTHERAPY: EFFICACY OF A NOVEL IN VITRO BREAST CANCER CHEMORESISTANCE PLATFORM TO DEMONSTRATE HIGH RESISTANCE PATTERNS IN RESIDUAL DISEASE

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Introduction: Functional precision medicine is an innovative treatment strategy in which drugs are tested on the patient's cancer cells cultured outside the body. It is a powerful method to understand tumor resistance and match the most appropriate treatment to the patient. Previous literature showed that patients with blood and brain cancer live longer when their chemotherapy regimens are guided by functional drug testing compared to their experiences of standard treatments. Some methods are already available worldwide, offering personalized drug testing services; however, in Brazil, no in vitro chemoresistance test for cancer is validated for use in the clinic. Indeed, screening many drugs in cancer cells cultured outside the body can be technically demanding, time-consuming, and costly. We developed a novel in vitro tumor resistance platform, aiming at an individualized and precise treatment in oncology, reducing toxicity and improving outcomes. Our in vitro resistance test has the advantage over other chemoresistance assays to exhibit the drugs stable within the platform, eliminating pipetting errors and reducing costs associated with the drugs. **Methodology:** Patients with invasive breast cancer (BC) who presented residual disease after neoadjuvant chemotherapy (NACT) were included. Fresh tumor samples were collected during surgery and dissociated to obtain the tumor cells. The tumor cells were cultured in the chemoresistance platform with doxorubicin, epirubicin, paclitaxel, docetaxel, carboplatin, cisplatin, and cyclophosphamide, and, after 72 hours, cell viability was evaluated. The test result is defined based on cell viability as low (<40%), medium (40%–60%), and high (>60%) resistance. **Conclusion:** This preliminary finding highlighted the efficacy of the in vitro chemoresistance platform to demonstrate that cancer cells in residual disease after NACT presented high resistance rates to several cytotoxic drugs commonly used in BC treatment. Suggesting a role of tumor resistance in the worse prognosis of patients with residual disease after NACT and highlighting the importance of a personalized breast cancer treatment strategy to avoid the use of inefficient drugs.