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Recent adavances and innovative approaches in metabolomics for understanding drug resistance in breast cancer

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Breast cancer is one of the leading cause of death worldwide. In Pakistan, prevalence of this ailment is highest amongst all types of cancer i.e. 38.5%. Chemotherapy is one of the treatments available for breast cancer that is mostly prefered and widely used. Most oftenly a combination of two or more medicines will be used as chemotherapy treatment for breast cancer. But in Chemotherapy, major clinical setback is drug resistance. Metabolomics is an emerging field that utilizes information of cellular biochemistry for the early detection, diagnosis and establishment of predictive biomarkers of breast cancer. Currently metabolics is use to evaluate a much comprehensive picture of tumor development and growth This review highlights potential metabolomics applications towards developing a more personalized and tailored chemotherapy treatment.The methodology is based on inclusion exclusion criteria. Literature survey, and questionnaire were included while clinical trials was excluded. This report provides a review of 17 articles out which few were excluded. The objective was to explore i) Early breast cancer detection ii) Mechanisms for breast cancer drug resistance iii) Chemotherapy in breast cancer and its success rate iv) Side effects of chemotherapy in breast cancer v) Metabolomics role in oncology vi) Advances in Metabolomics. According to the survey the average response rate of a cancer drug is the lowest at 21%, suggesting that 79% of patients with cancer are over-dosed. While according to an international study, 40%–50% of breast tumors will display acquired resistance.When specific therapies are chosen on the basis of a patient's metabolomics profile, it will give rise to customized medicine and personalized tailored treatment. Using high throughput information using metabolomics to clinical diagnosis and treatment can help accelerate the patient safety, quality of life and survival rate by identifying pathways involved in drug resistance. Metabolomics is future of anti-cancer pharmacology, following "the right drug for the right patient at the right time" can offer safety, quality and effectiveness of anti-cancer treatment.

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