JL09. Personalized Medicine for Breast Cancer

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Breast cancer is a biologically complex disease and remains one of the leading causes of cancer-related deaths in the world. Recent advances in genomic profiling of breast cancer tumors show promise in improving the outcomes of breast cancer patients. Testing the molecular composition of breast cancer tumors is a practice that began years ago with the testing and use of the estrogen receptor status of breast cancer tumors to guide the use of endocrine therapy. More recently, the practice of genetic profiling of the tumor has provided clinicians with a much greater opportunity to provide molecular-based personalized medicine. It has facilitated improvement in the prognostication of distant disease recurrence and the prediction of the benefit of adjuvant chemotherapy. This has allowed many patients to avoid unnecessary toxicities associated with chemotherapy. Studies have shown that gene assays have influenced clinicians to change treatment recommendations in 25% of patients. Molecular profiling can also provide information about agents that are most likely to have the greatest clinical benefit and identify those that have a potential lack of benefit. The identification of aberrant genes in breast cancer tumors can help guide clinicians and pharmaceutical companies in the development of targeted therapeutic agents. The possibility of monitoring a patient's disease status, response to a therapy or early detection of relapse represents other areas where personalized medicine may prove beneficial. Circulating tumor cells (CTCs) can be used to monitor treatment effect in metastatic breast cancer and provide additional prognostic information for patients on active therapy. CTCs have a comprehensive molecular characterization that could possibly serve as a "liquid biopsy," thus enabling targeted therapy. Research is ongoing to identify other reliable tumor markers. The molecular profiling of breast cancer and its implications are promising. Many studies of personalized medicine in breast cancer are ongoing, and many more are needed to bring this exciting approach to the clinical forefront.