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Challenges in breast cancer treatment and long-term drug safety

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Breast cancer is the most common cancer in women worldwide. It is also the principle cause of death from cancer among women globally. Despite the high incidence rates in Western countries, 89% of women diagnosed with breast cancer are still alive 5 years after their diagnosis, which is due to detection and treatment. Breast cancer incidence has been increasing. In 2015, an estimated 231,840 new cases of invasive breast cancer are expected to be diagnosed in women, along with 60,290 new cases of non-invasive (in situ) breast cancer. About 2,350 new cases of invasive breast cancer are expected to be diagnosed in men in 2015. A man's lifetime risk of breast cancer is about 1 in 1,000. Breast cancer incidence rates in the U.S. began decreasing. One theory is that this decrease was partially due to the reduced use of Hormone Replacement Therapy (HRT) after the results of a large study called the Women's Health Initiative were published in 2002. These results suggested a connection between HRT and increased breast cancer risk. About 5-10% of breast cancers can be linked to gene mutations. Mutations of the BRCA1 and BRCA2 genes are the most common. On average, women with a BRCA1 mutation have a 55-65% lifetime risk of developing breast cancer. For women with a BRCA2 mutation, the risk is 45%. Breast cancer that is positive for the BRCA1 or BRCA2 mutations tends to develop more often in younger women. An increased ovarian cancer risk is also associated with these genetic mutations. In men, BRCA2 mutations are associated with a lifetime breast cancer risk of about 6.8%; BRCA1 mutations are a less frequent cause of breast cancer in men. All drugs for breast cancer treatment developed and in market cause mild to several side effects and the safety, pharmacovigilance, signal detection and risk management of breast cancer drugs are difficult to manage.

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