An Update on Breast Cancer Screening and Prevention

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KEYWORDS

• Breast cancer risk assessment • Breast cancer screening • Breast cancer prevention • Mammography • Breast MRI • Guidelines

KEY POINTS

- Risk assessment is a key component for determining an individual's options for breast cancer screening and prevention.
- A primary care clinician needs to be able to identify risk factors that place a woman at higher-than-average risk for breast cancer, and if needed, place the appropriate referral for genetic counseling and risk-reduction assessment.
- Mammography is universally recommended for women ages 50 to 74, with the frequency of screening (annually or biennially) to be determined by individual patient preferences and a balance of net harms and benefits.
- Although guidelines generally recommend offering screening for women ages 40 to 49, some place additional emphasis on a shared decision-making model between patient and providers.
- Preventive measures, such as physical activity, tobacco cessation, limiting alcohol use, and maintaining a healthy weight, should be encouraged for all women to reduce breast cancer risk, and chemoprevention with selective estrogen receptor modulators is an important consideration for women at high risk from breast cancer.

INTRODUCTION

Breast cancer, the most common noncutaneous cancer among women in the United States, kills more women every year than nearly all other cancers, falling second only to lung cancer.[1,2] Surveillance estimates suggest more than 230,000 women will be diagnosed with breast cancer in 2014, and the disease will claim an estimated 40,000 lives.[3]

Conflict of Interest: None.

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In the 1980s and 1990s, the incidence of diagnosed breast cancer rose because of an increase in mammography screening. The incidence then decreased sharply from 2002 to 2003, largely attributable to a reduction in the use of hormone replacement therapy following findings from the Women's Health Initiative.[4] Since 2003, the incidence of diagnosed breast cancer has remained relatively stable.[1]

Mortality rates from breast cancer have declined steadily since 1990. Among women younger than 50, death rates have decreased on average by 3.2% per year; the rate of decline has been slightly lower in women older than 50, at approximately 2.0% per year.[5] Continued improvements in cancer detection and treatment are the primary reasons for this drop[6]; however, not all segments of the population have benefited equally. Mortality rates, for example, have declined more slowly among blacks than whites, despite blacks' lower incidence rate. Age-adjusted mortality based on 2006 to 2010 surveillance data show the breast cancer incidence rate was 121.4 cases per 100,000 black women versus 127.4 cases per 100,000 white women; mortality, however, was 30.8 deaths per 100,000 black women versus 22.1 deaths per 100,000 white women.[5] The 5-year (2003–2009) relative survival rate is also lower for black women versus white women, at 78.7% versus 90.4%, respectively.[5] This disparity has been attributed to multiple factors, including more aggressive tumors, social conditions, access to high-quality health care, differences in detection (including screening behaviors), health system factors, and treatment differences.[7–12]

RISK ASSESSMENT FOR BREAST CANCER

Risk factor assessment is critically important for breast cancer screening. Women should be divided into high-risk or average-risk categories to guide screening options and risk-reduction strategies. Although screening programs traditionally use age as the primary risk factor, the individual's collective risk factors determine the net benefits and harms of additional screening, such as genetic testing, or interventions to reduce risk, such as chemoprevention.

Risk Factors

Age

The most important risk factor for breast cancer is age. Approximately 10% of women are diagnosed between ages 35 and 44, 22% are diagnosed between ages 45 and 54, and 25% are diagnosed between ages 55 and 64. Median age for diagnosis is 61 years, and the median age at death is 68 years.[5]

Family history and heritable gene mutations

Family history of breast or ovarian cancers on either the maternal or paternal side are also important risk factors, particularly in women diagnosed at younger than 45 years.[13] Women who have one first-degree female relative with breast cancer have a 1.8 times higher risk of developing breast cancer compared with women with no family history. Having 2 first-degree relatives with breast or ovarian cancer increases breast cancer risk by almost threefold; for women with 3 or more relatives, risk jumps by almost fourfold.[14] An estimated 10% of breast cancers can be attributed to an inherited gene mutation. *BRCA1* and *BRCA2* gene mutations are involved in hereditary breast and ovarian cancers, which occur with higher frequency in certain ethnic groups, such as the Ashkenazi Jewish population. Other more rare mutations include *TP53* and *PTEN*, which are associated with Li-Fraumeni syndrome and Cowden syndrome, both of which lead to an increased risk for breast cancer. The mutation in the *CDH1* gene involved with hereditary diffuse gastric cancer also predisposes women to an increased risk for lobular breast cancer.[13]