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Universal genetic screening cost-effective for breast, ovarian cancer

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Population-based screening for genetic mutations that put women at risk for breast and ovarian cancer is cost effective and may prevent more cancers than current practices, according to researchers in the U.K.

“Recent advances in genomic medicine offer us the opportunity to deliver a new population-based predictive, preventive and personalized medicine strategy for cancer prevention,” **Ranjit Manchanda, MD, MRCOG, PhD,** of the Barts Cancer Institute at Queen Mary University, London, said in a press release. “Our findings support the concept of broadening genetic testing for breast and ovarian cancer genes across the entire population, beyond just the current criteria-based approach. This could prevent thousands more breast and ovarian cancers than any current strategy, saving many lives.”

The researchers created a decision-analytic model to compare the lifetime costs of testing all women aged 30 years and older with testing only women who fulfilled clinical criteria or had a strong history of cancer in their families. The main outcomes were ovarian cancer, breast cancer and additional heart disease deaths. Manchanda and colleagues also calculated quality-adjusted life years, breast and ovarian cancer incidence and incremental cost-effectiveness ratios. The researchers evaluated cost-effectiveness for both the U.K. and the U.S.

Clinical criteria and/or family-history based *BRCA1*/*BRCA2*/*RAD51C*/*RAD51D*/*BRIP1*/*PALB2* testing was cost effective compared with family-history or clinical criteria-based *BRCA1*/*BRCA2* testing (incremental cost-effectiveness ratio, £7,629.65 or $49,282.19 per quality-adjusted life year; 0.04 days of life expectancy gained).

However, compared with current policy, the most cost-effective screening strategy was population based testing for *BRCA1*/*BRCA2*/*RAD51C*/*RAD51D*/*BRIP1*/*PALB2* mutations (incremental cost-effectiveness ratio, £21,599.96 per quality-adjusted life year or $54,769.78; 9.34 or 7.57 days of life expectancy gained).

When researchers used willingness-to-pay thresholds of £30,000 or $100,000 per quality-adjusted life year, this strategy was preferred in 83.7% and 92.7% of simulations, respectively, whereas criteria-based or family history-based testing was the preferred strategy in just 16.2% and 5.8% of simulations.

Population-based *BRCA1*/*BRCA2*/*RAD51C*/*RAD51D*/*BRIP1*/*PALB2* testing was projected to prevent 1.86% of breast cancers in the U.K. and 1.91% of breast cancers in the U.S., as well as 3.2% and 4.88% of ovarian cancers, respectively. The method prevented a projected 657 ovarian cancer cases per million in the U.K. and 655 cases per million in the U.S., along with 2,420 and 2,386 breast cancer cases per million.

“Our analysis shows that population testing for breast and ovarian cancer gene mutations is the most cost-effective strategy which can prevent these cancers in high risk women and save lives,” **Rosa Legood, DPhil, MSc,** a co-author of the study and associate professor of health economics at the London School of Hygiene and Tropical Medicine, said in the press release. “This approach can have important implications given the effective options that are available for ovarian and breast cancer risk management and prevention for women at increased risk.” *-by Andy Polhamus*

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