Medical Xpress

Whole-population testing for breast and ovarian cancer gene mutations is cost effective

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Screening the entire population for breast and ovarian cancer gene mutations, as opposed to just those at high-risk of carrying this mutation, is cost effective and could prevent more ovarian and breast cancers than the current clinical approach, according to research published today in the *Journal of the National Cancer Institute*.

Researchers believe that implementing a programme to test all British women over 30 years age could result in thousands fewer cases of ovarian and breast cancer; up to 17,000 fewer ovarian cancers and 64,000 fewer breast cancers.

The most well-known breast and ovarian cancer causing genes are BRCA1 and BRCA2, and women carrying either a BRCA 1 or BRCA2 gene mutation have approximately a 17%-44% chance of developing ovarian cancer and a 69-72% chance of developing breast cancer over their lifetime. The population based risk for women who do not carry the gene mutation is 2% for ovarian cancer and 12% for breast cancer over their life time. Women who are known to be carriers can manage and reduce their risk of developing cancer by enhanced screening, medical prevention or risk-reducing surgery. The current clinical approach to genetic testing is based on having a personal or family history of breast or ovarian cancer.

Yet research led by researchers from Barts Cancer Institute at Queen

Mary University of London and Barts Health NHS Trust, supported by the London School of Hygiene & Tropical Medicine, used complex mathematical models to compare costs and health benefits of different strategies for genetic testing. They compared strategies of population testing for breast and ovarian cancer genes with clinical criteria or family history testing. They found that the most cost-effective strategy was population testing for multiple cancer genes which prevented many more ovarian and breast cancers than current screening methods. They undertook analysis and showed that a new approach of population testing for multiple genes would be cost-effective for both UK and US health systems.

Dr Ranjit Manchanda, Consultant Gynaecological Oncologist, Barts Cancer Institute at Queen Mary University of London, and Barts Health NHS Trust, UK, says: "Recent advances in genomic medicine offer us the opportunity to deliver a new population-based predictive, preventive and personalized medicine strategy for cancer prevention. 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.

"With the costs of testing falling this approach can ensure that more women can take preventative action to reduce their risk or undertake regular screening. As knowledge and societal acceptability of this type of testing increases, it can in the future provide huge new opportunities for cancer prevention and changes in the way we deliver cancer genetic testing."

Dr Rosa Legood, Associate Professor Health Economics, London School of Hygiene and Tropical Medicine says: "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. 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."

Athena Lamnisos, CEO, The Eve Appeal, says: "These research findings demonstrate the potential for both saving lives and costs. Whole-population genetic testing is cost-effective. If women identified as high risk act on the information that they're given, in terms risk reducing surgery, their lifetime risk of developing these women-specific cancers can be reduced. The impact that this study could have on healthcare in the future for these cancers is promising and an exciting step forward in prevention. "

More information: Ranjit Manchanda et al, Cost-effectiveness of Population-Based BRCA1, BRCA2, RAD51C, RAD51D, BRIP1, PALB2 Mutation Testing in Unselected General Population Women, *JNCI: Journal of the National Cancer Institute* (2017). dx.doi.org/10.1093/jnci/djx265

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