Cost-effectiveness of population BRCA testing with varying Ashkenazi Jewish ancestry

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Background

Population based BRCA1/2 testing in Ashkenazi Jewish (AJ) women aged ≥30 years with four AJ grandparents, has found to be cost-effective in comparison to family history (FH) based testing. However, 25% UK and 44% USA Jewish marriages are to non-Jews.1 Hence, many women may have differing AJ ancestry consisting of one, two, three or four AJ grandparents.

This study aims to model the cost-effectiveness of population based BRCA1/2 testing compared to family-history based testing in women with differing AJ ancestry.

Methods

A decision-analytical model developed to calculate cost-effectiveness for screening women with four AJ grandparents was adapted to model cost-effectiveness outcomes for women of differing AJ ancestry.3

The following model estimates were recalculated: population prevalence of BRCA1, the probability of having a positive family history and the BRCA1/2 prevalence in FH negative individuals. These probability parameters were adjusted for relative BRCA mutation frequency in AJ and general populations.

BRCA prevalence with 3AJ grandparents= (0.75*AJ prevalence)+(0.25*General-population prevalence), for 2 AJ grandparents= (0.5*AJ prevalence+0.5*General-population prevalence) and for 1 AJ grandparent= (0.25*AJ prevalence+0.75*General-population prevalence). One-way and probabilistic sensitivity analysis (PSA) were conducted on all four scenarios to account for any uncertainty.

Results*

Population-testing in women with two, three and four AJ grandparent ancestry was found to be cost-saving and cost-effective at -£2429, -£1797, -£736 per QALY respectively. A cost-effective ICER of £1341/QALY was observed for women with one AJ grandparent.

The PSA showed ≥95% of simulations for one, two, three and four AJ women were found to be cost-saving and cost-effective for screening 

Conclusion

This study demonstrates the cost-effectiveness of population-based BRCA1/2 testing in women with differing AJ ancestry. Our results support the move for changing the paradigm from FH to population-based testing across the entire AJ population. These results however cannot be extrapolated to the general non-Jewish population.

*Results have been updated since the publication of this poster and abstract. Current results are available in the American Journal of Obstetrics & Gynecology.

References