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Category Breast

Title - SHOULD WE OFFER MULTI-GENE TESTING TO ALL PATIENTS WITH BREAST CANCER: A COST-EFFECTIVENESS ANALYSIS

Li Sun (0000-0001-5569-7296)1,2, Adam Brentnall3, Shreeya Patel1,2, Diana S.M. Buist4, Erin J.A. Bowles4, D.Gareth R Evans (0000-0002-8482-5784)5, Diana Eccles (0000-0002-9935-3169)6, John Hopper7, Shuai Li7, Stephen Duffy3, Jack Cuzick3, Isabel dos-Santos-Silva8, Zia Sadique1, Li Yang (0000-0003-0640-2003)9, Rosa Legood1,2, Ranjit Manchanda (0000-0003-3381-5057)2,10,11*®

ABSTRACT

Objectives: To estimate incremental lifetime-effects, costs, cost-effectiveness and population impact of multigene-testing all BC patients compared to current practice of family-history/clinical-criteria based genetic (BRCA)-testing.

Methods: Cost-effectiveness microsimulation modelling study comparing lifetime costs-&-effects of BRCA1/BRCA2/PALB2 (multigene) testing all unselected BC-cases (Strategy-A) with family-history/clinical-criteria based BRCA1/BRCA2-testing (Strategy-B) in both UK and US populations. Data obtained from 11,836 population-based BC-patients (regardless of family-history) recruited to four large research studies in the UK (Predicting-Risk-of-Breast-Cancer-at-Screening (PROCAS: 1389 out of 57,000 women) & Prospective-Outcomes-in-Sporadic-versus-Hereditary-breast-cancer (POSH: 2885) studies); US (Kaiser-Permanente Washington Breast-Cancer-Surveillance-Consortium (BCSC) registry: 5892 out of 132,139 women) and Australia (Population-based BC-cases of the Australian-Breast-Cancer-Family-Study (ABCFS: 1670 women)). The main outcome measure was the incremental cost per quality-adjusted life-year (QALY) gained with a 3.5% annual discount. Parameter uncertainty was explored using one-way and probabilistic sensitivity analyses.
Results: Compared with current clinical-criteria/family-history-based BRCA-testing, (BRCA1/BRCA2/PALB2) multigene-testing for all BC-patients would cost £10,470/QALY (UK) or $58,702/QALY (US) gained, well below UK/NICE and US cost-effectiveness thresholds of £30,000/QALY & $100,000/QALY. Probabilistic sensitivity-analysis shows unselected multigene-testing remains cost-effective for 98% UK/ 77% US health-system simulations. One year’s unselected panel-genetic testing can prevent 1,776 BC/OC-cases and 557 deaths in the UK; and 8,258 BC/OC-cases and 2,143 deaths in the US. Correspondingly, 7 UK/32 US excess heart-disease deaths occur annually.

Conclusions: Unselected multigene-testing for all BC patients is extremely cost-effective compared with family-history/clinical-criteria testing for UK and US health-systems. It prevents thousands more BC/OC cases and deaths. We recommend changing current policy to expand genetic-testing to all BC patients.