

Contralateral breast cancer (CBC) incidence and risk in New Zealand (NZ).

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**Background:** Patients with unilateral breast cancer (UBC) are at increased risk of developing CBC. Several factors have been identified that influence this risk, however reports are inconsistent. CBC rates and patient outcome in NZ are unknown. **Methods:** NZ cancer registers provided information for patients with UBC diagnosed between June 2000 and December 2012. Patients without metastases who develop a subsequent second primary cancer in the contralateral breast were classed as having CBC. Logistic regression was performed to delineate association between variables and CBC diagnosis. Survival differences were determined by log rank test. **Results:** 10,374 patients had UBC, median follow-up 4.6 years. 48 women (0.46%) developed CBC, six within a year of UBC diagnosis (0.05%), and 30 by year 5 (0.3%). Variables associated with CBC development include being postmenopausal (HR 2.2,  $p = 0.02$ ), pT stage 4 (HR 8.6,  $p = 0.00$ ), and prior treatment with endocrine therapy (HR 2.0,  $p = 0.04$ ). Having a first degree relative with breast or ovarian cancer was associated with CBC (HR 2.1,  $p = 0.02$ ), however diagnosis in any less immediate relative/s was not (HR 1.2,  $p = 0.53$ ). Lobular histology was not associated with CBC development (HR 1.4,  $p = 0.45$ ). Compared to all other ethnic groups, Maori showed a non-significant trend toward CBC development (HR 2.1,  $p = 0.06$ ). Being premenopausal and having fewer nodes removed at UBC diagnosis were associated with reduced CBC rate (HR 0.4 and 0.24 respectively,  $p < 0.05$ ). BRCA testing was performed infrequently in this

population (1.6% of patients), and no patient who developed CBC had a documented BRCA mutation. Mortality was greater in those with CBC (33.3% cf. 16%, HR 1.7, p = 0.09), as was disease specific mortality (18.8% cf. 8.5%, HR 1.75, p = 0.18). Development of metastases was far more common than CBC (ratio 26:1). **Conclusions:** The incidence of CBC in the NZ population is much lower than in historical series, and is vastly outnumbered by the incidence of metastatic cancer. Patients with CBC have increased overall and disease specific mortality. Several factors were identified in our population that were associated with CBC development. The risk of CBC in patients with a positive family history but no BRCA mutation remains undefined.

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