BRCA Mutations Found in Women with Little or No Family History

Hereditary Breast and Ovarian Cancer Syndrome is caused by mutations in the \textit{BRCA1} and \textit{BRCA2} genes. Because these mutations can be inherited through either the maternal or the paternal side of the family and family history of cancer may be lacking due to a small family structure, researchers have found that a significant proportion of \textit{BRCA1} and \textit{BRCA2} mutation carriers do not have a family history of breast or ovarian cancer.\textsuperscript{1,2} The authors of the following study examined the prevalence of \textit{BRCA1} and \textit{BRCA2} mutations in women with early onset breast cancer in which there was no family history of breast or ovarian cancer.


Purpose:
To examine the prevalence of BRCA gene mutations among single cases of early onset breast cancer within a limited family structure compared to families with adequate structure.

Design and Methods:
Of 1543 women presenting for genetic testing for \textit{BRCA1} and \textit{BRCA2} mutations, 306 were diagnosed under the age of 50 and reported no family history of breast or ovarian cancer. Family structure was considered limited when there were fewer than two first- or second-degree female relatives surviving past the age of 45 in either the maternal or paternal side of the family. Of the 306 families included in the study, 153 (50\%) were considered to have a limited family structure.

Results:
Of the 306 women meeting the inclusion criteria of this study, 29 (9.5\%) women were found to carry a mutation in \textit{BRCA1} or \textit{BRCA2}. When stratified by family history structure, 21 of 153 (13.7\%) women with a limited family structure were found to carry mutations. Over 75\% of these mutation carriers would have been missed using the risk prediction models currently available.

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\textbf{Limited family structure} & 153 & 13.7\% \\
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\textbf{Overall} & 306 & 9.5\% \\
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Bottom Line:
While knowing the family history of individuals with breast cancer is important, family history cannot be used solely to determine eligibility for testing. Nearly 14\% of women with isolated breast cancer under 50 whose family history structure is limited carried mutations in \textit{BRCA1} and \textit{BRCA2}. Thus, women with breast cancer diagnosed before the age of 50 years, regardless of family history, are appropriate candidates for testing for hereditary breast and ovarian cancer syndrome.

\textsuperscript{1} Science 2003;302:643-6.\hspace{1em}2. Cancer 2005;104(12):2807-16.