

Breast density study explores cancer risk factor

October 5 2010, By Kelly Rankin

Mothers and daughters are participating in a first-of-its-kind study aimed at discovering the genes responsible for determining breast tissue density.

Between 2003 and 2007, Professor Norman Boyd of medical biophysics, a researcher at the Ontario Cancer Institute at Princess Margaret Hospital, led the first phase of the study involving 400 young women between the ages of 15 and 30 and their mothers to learn more about the development of breast tissue density in early life.

“We know from previous work in adults that density is a very strong breast cancer risk factor, and because of that we are interested in when breast tissue density development begins and what factors control it,” said Boyd.

In an earlier study published in 2002, Boyd and his colleagues looked at the mammograms of a thousand pairs of twins from North American and Australia. About half of the pairs were identical twins and all participants were between the ages of 40 and 70. What they discovered was that breast tissue density in the identical twins was much more alike than in the non-identical twins.

“When we did the appropriate analysis of this study, it told us about two-thirds of the variation in density is due to inherited genes,” said Boyd. “So we’re trying to find out what those genes are and young women are of interest because we believe these features of the breast begin in

adolescence.”

The daughters participating in the study had magnetic resonance images (MRIs) taken of their breasts, rather than mammograms, because the breast is susceptible to radiation at early ages and MR uses no radiation. The researchers use the MRIs to measure the water content of the breast — the more water in a breast, the denser the breast tissue — which they then compare to the mothers’ mammograms and other factors, such as physical activity, age and weight.

Mothers are included in Boyd’s study to provide information the daughter might not know, such as her birth weight or the family’s breast cancer history. She also provides a mammogram.

From the first phase of the study the researchers found that breast density varies in the development of young women and is affected by factors such as weight (the heavier the daughter the less water), height (the taller the daughter the more water) and the mother’s breast density. The more dense the mother’s breast, the greater the water content of the daughter’s breast. All of this evidence demonstrates that inheritance is a really important factor and that breast density might be the result of genetic factors that affect growth and development in early life.

The second phase of the study is currently underway and will include 600 young women between the ages of 15 and 18 and their mothers. The researchers will continue to examine the relationship between [breast tissue](#) density with lifestyle factors, hormones and growth factors in the blood and genetic factors. This work is supported by a grant from the National Institutes of Health.

Although they are several years from completing their research, Boyd said that discovering the [genes](#) responsible for determining breast density could lead to new methods of [breast cancer](#) prevention.

When asked to imagine what the treatment for that would be Boyd was cautious.

“Exactly what we would want to intervene with is not clear. It may be a lifestyle activity we could change. It may be drug development. What we learn from the genetic studies will be very helpful in determining whether or not there are targets that could be the subject of drug intervention,” said Boyd.

More information: If you are interested in participating in this study, please send an email to [youngwomenstudy\(at\)uhnres.utoronto.ca](mailto:youngwomenstudy@uhnres.utoronto.ca)

Provided by University of Toronto

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