Researcher examines link between viruses and breast cancer

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The University of Canterbury's Chair of Cancer Epidemiology, Professor Ann Richardson is looking at whether it's possible that exposure to certain viruses might increase the risk of breast cancer. Credit: University of Canterbury

The University of Canterbury's Chair of Cancer Epidemiology,

Professor Ann Richardson, is on a mission to discover if there is a link between common viruses and breast cancer.

Her research team, the Wayne Francis Cancer Epidemiology Research Group, together with colleagues at the University of Otago (Christchurch) and internationally, has been working on a number of breast cancer research projects, including one which is testing the hypothesis that late exposure – in adulthood, rather than childhood – to common viruses such as cytomegalovirus or Epstein-Barr virus increases the risk of breast cancer.

"This has been an enduring interest of mine, looking at whether it's possible that exposure to certain viruses might increase the risk of breast cancer, and so that's been a focus of research," Professor Richardson says.

Where it all started

Professor Richardson's research interest in viruses and breast cancer began when she compared countries in terms of when women are exposed to a virus or seroconvert – which means they're exposed to the virus and they develop antibodies.

"I found that countries where most of the population had been exposed to the viruses at a young age had the lower risk of breast cancer," Professor Richardson says.

"Whereas in countries like New Zealand where a proportion of the population might not be exposed to viruses such as cytomegalovirus and Epstein-Barr virus – the sort of viruses that cause glandular fever – until they're adults or young adults, these countries had the highest breast cancer incidence."

Professor Richardson carried out a study in partnership with Australian colleagues to compare antibody levels for these viruses in women with breast cancer and women without. They found that women with breast cancer had higher antibody levels than those without.

From New Zealand to Norway

A second study using Norwegian blood samples also found that women with breast cancer were likely to have higher antibody levels for cytomegalovirus than women without breast cancer.

"And the interesting thing about both the Australian and the Norwegian study was that there seemed to be an association for one virus, cytomegalovirus, but not the other."

The research group has also recently carried out a Finnish breast cancer case-control study. Professor Richardson says the findings will be included in a review article on cytomegalovirus and breast cancer.

"This research builds on the earlier study carried out in Norway. The study compared cytomegalovirus and Epstein-Barr virus antibody levels in stored blood samples from 800 women with breast cancer and 800 women without breast cancer in a Finnish serum bank."

Professor Richardson says it is possible that there is no link between cytomegalovirus or Epstein-Barr virus and breast cancer.

"We hope that if we do find a link, it might lead to a preventive strategy – through immunisation for instance. It may be that isn't what we find, but the research we're doing helps us to get a step further and is advancing knowledge."

Lifestyle changes reduce cancer risk

Another recent project the research group has undertaken involved identifying lifestyle factors that could be modified to reduce the risk of developing breast cancer and bowel cancer in Aotearoa New Zealand.

"For breast cancer it was reducing HRT [hormone replacement therapy] use, reducing obesity, increasing regular physical activity and avoiding high alcohol intake. For bowel cancer it was reducing obesity and alcohol consumption again, reducing smoking, reducing consumption of red and processed meats, and increasing regular physical activity," Professor Richardson says.

"You have to be careful when you do work like this because there's only a certain proportion of cancer you can prevent through lifestyle change," she says.

"We hope this sort of information helps people to understand the risks, but also [helps] agencies like the Ministry of Health and the Cancer Society."

As a result of her involvement in these research projects, Professor Richardson was invited to join the Cancer Society of New Zealand National Health Promotion Advisory Committee in 2017.

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