Evaluation of thermography as a screening and diagnostic tool for breast cancer

Belinda Scott

Over the last 2 years there has been considerable debate about the use of breast thermography in New Zealand. Thermographs do not involve any radiation and are easy to undertake as there is also no compression of the breast. However its efficacy is unclear.

In 2010, a position statement was produced on the use of thermography as a breast cancer screening or diagnostic tool.¹ It concluded that there was insufficient evidence to support the use of thermographs either in diagnosis or screening for breast cancer. Following publication of this statement there was an outcry from the thermal imaging industry in New Zealand.

The systematic review² by the New Zealand Guidelines Group (NZGG) in this issue of the NZMJ is therefore welcome and timely as it answers many questions and allows women and health professionals to make better decisions regarding breast cancer imaging, either for diagnosis or screening. The NZGG review reports that thermography has a sensitivity for screening of 25% (compared to mammography of 89.45%), and specificity of 74% (compared to mammography of 91% initial screen and 97.7% subsequent screens).

As a diagnostic tool when women had symptoms, an abnormal mammogram or suspicious findings, the sensitivity ranged from 25% to 97% and specificity ranged from 12% to 85%. This compares to mammography for diagnosis where sensitivity is 85.8% and specificity is 87.7%.

In the NZGG review, only one study reported on screening and five studies reported on diagnosis. Unfortunately the design of the screening study was poor thus leading to bias and limiting the usefulness of the data. The review concludes that thermography was not sufficiently sensitive to be used as a screening tool. The diagnostic studies were also problematic as they were considered only of average quality and there were many false-positive results leading to the possibility of incorrect diagnosis in many of the studies.

So what do we use? What is the best screening tool we have available in 2012?

Eight randomised controlled trials have evaluated the benefits of screening mammography. Seven of these trials have been designed to evaluate screening in women 40 to 74 years. These trials show a benefit to screening women in this age group with reductions in mortality of 16% to 29%.

With early detection and treatment improvements we can now say that over 80% of our patients diagnosed with breast cancer are alive at 10 years, and this trend is increasing, even though we have more women being diagnosed.
At present the use of regular mammography remains the single best means of reducing the risk of dying from breast cancer, because although having a mammogram does not stop a woman developing the disease, it increases the chance that it will be picked up early if it is present.

Under the Breast Screen Aotearoa programme, a free mammogram is available every 2 years to women aged 45–69 years. Outside the programme, a screening mammogram usually costs about $150—a bit less than the $200 for a thermogram.

**Looking forward, do I see a place for thermographs as a scientifically proven tool?**

Any new technology, whether pharmaceutical or surgical or radiological, always requires careful evaluation (including benefits and harms and costs in the case of screening programmes) and this means randomised controlled trials. Enthusiasts of thermographs need to seek this sort of evaluation in order to prevent harm to patients.

The NZGG review concludes that there is insufficient evidence showing that thermography provides benefit to patients as an adjunctive tool to mammography or to suspicious clinical findings in diagnosing breast cancer.

In conclusion, in the future there may be other imaging modalities that we at present do not know about: these will also require scrutiny and scientific study to determine their place in our armamentarium.

It is vital that we offer our patients correct information with supporting statistical, scientific, reproducible evidence so that they and their physicians can make informed decisions regarding their health.

For now I believe we should put thermography to rest.

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**References:**
