ARTICLE : SHORT COMMUNICATION

Screening for breast cancer:
Should we or shouldn't we?

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Haitham Al-Mahrouqi is a fifth year medical student at the University of Otago, Christchurch. His BMedSc (Hons) degree was on the epidemiology of stomach cancer in Oman and he recently graduated with first class honours. Apart from public health, Haitham has a passion for ophthalmology.

Have we got breast cancer screening wrong? Recent evidence suggests that we may certainly have.

Breast cancer is an important cause of morbidity and mortality for women. Globally, breast cancer is the most frequently diagnosed cancer among women, affecting nearly a million and a half women annually.[1] Despite its relatively good prognosis, breast cancer is nevertheless the most prevalent cancer in the world.[2] The incidence of breast cancer has been increasing and mortality decreasing over the past few decades, particularly in the more developed countries. This phenomenon may be partly attributed to the existing screening programmes.[3]

Breast cancer screening is a secondary preventative measure aiming at reducing breast cancer mortality. Ideally, a screening programme should be cost-effective, accepted by the public and have high quality evidence confirming that its benefits outweigh its harms. Mammography, as a breast cancer screening tool, involves imaging the breasts using low dose x-ray. A large Canadian study found that the sensitivity and specificity of mammography were 0.75 and 0.94 respectively.[4] However, the sensitivity and specificity are likely to differ according to the phase of the menstrual cycle and with hormone replacement therapy.[5]

Screening using mammography has been practiced for at least 10 to 20 years in many developed countries. In New Zealand, breast cancer screening began in 1998.[6] Earlier on, the decision to embark on breast screening was based on two large trials, one conducted in New York and the other in Sweden.[7] At the time however, the harms of breast cancer screening were unclear.

A meta-analysis of seven large randomised controlled trials (RCTs), which tested the effectiveness of screening using mammography in decreasing mortality from breast cancer, was recently published by The Cochrane Library.[8] Seven large RCTs involving 600,000 women 40 years or older were included in the review. Three of the seven trials were adequately randomised and the meta-analysis showed no significant reduction in breast cancer mortality at 13 years in the screened arm compared to the controlled group (RR 0.90, 95% CI 0.79–1.02).[8] Randomisation in the other four trials were sub-optimal, but the meta analysis found a 25% risk reduction in breast cancer mortality with mammography (RR 0.75, 95%CI 0.67 0.83). Combining the seven trials gave a risk reduction of 19% (RR 0.81, 95% CI 0.74–0.8).[8]

In screening programs, mortality is a better measurable outcome than survival in reducing lead time bias* and length time bias.[9] The authors of the meta-analysis found that breast cancer-specific mortality was an unreliable outcome because the screened group were more likely to be assigned breast cancer as a cause of death than the controlled group.[8] This bias may result in an exaggerated harm of screening. Nevertheless, the three adequately randomised trials found no difference in breast cancer-specific mortality or in all-cause mortality between women who were screened and those who were not.

The biggest harm from screening is over-diagnosis and unnecessary treatment. Over diagnosis results from the screening process preferentially identifying slow growing tumours or non-malignant changes that would have caused no harm if left untreated. This meta analysis found that there was a 30% increase in the rate of lumpectomies and mastectomies in the screened arm compared to the controlled arm.[8] Similarly the rate of radiotherapy was higher in the screened arm.

Absolute risk is better than relative risk in understanding the magnitude of the screening effect.[8] Using reasonable estimates, this meta-analysis found that if 2000 women were screened for ten years, only one woman would have her life prolonged, ten would be treated unnecessarily, and a further 200 women would experience significant psychological distress and pain due to false positive results.

From this recent evidence, it is uncertain whether the benefits of breast cancer screening really outweigh the harms of over-diagnosis, unnecessary treatment and anxiety. Before doctors advocate breast cancer screening, it is pertinent to discuss the benefits and the harms of screening with the individual to allow her to make an informed decision as to whether to be screened or not. It is also important to consider the risk of breast cancer on an individual basis as the benefit of screening may outweigh the harm, especially in women with a strong family history and those who are older. In addition, it is important for the National Screening Unit in New Zealand to make the information regarding the harms of screening clearly available to the public and not present a one-sided view towards the benefits of screening on their website (www.nsu.govt.nz) and in the Breast Screen Aotearoa brochures.

Further research should be carried out to find ways to lessen the problem of over-diagnosis from breast cancer screening such as developing better correlation of histological findings with the risk of malignancy.

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Lead time bias is a seemingly prolonged survival due to earlier diagnosis through the screening programme rather than prolonging longevity, a situation arising where effective treatment is unavailable.

Length time bias occurs as screening detects slow growing tumours that would otherwise have not caused any problem in a person's lifespan.

REFERENCES

1. Ferlay J, Shin H, Bray F, Forman D, Mathers C, Parkin D.
Cancer Incidence and Mortality Worldwide: International Agency for Research on Cancer, Lyon 2010
GLOBOCAN 2008 (Available from: http://globocan.iarc.fr)

2. Parkin DM, Bray F, Ferlay J, Pisani P.
Global cancer statistics, 2002
CA: A Cancer Journal for Clinicians 2005;55(2):74-108.

3. Ferlay J.
WHO Mortality Database
IARC Descriptive Epidemiology Group, Lyon 2008 (Available from: http://www-dep.iarc.fr/).

4. Baines C, McFarlane D, Miller A.
Sensitivity and specificity of first screen mammography in 15 NBSS centres
Canadian Association of Radiologists Journal 1988;39(4):273.

5. Abbasi K.
Sensitivity of mammography depends on menstrual phase
BMJ 1997;315(7106):445-48.

6. Richardson A, Cox B, Brown T, Smale P.
The impact of breast cancer screening on breast cancer registrations in New Zealand
NZMJ 2005;118(1209).

7. Moss S.
A trial to study the effect on breast cancer mortality of annual mammographic screening in women starting at age 40
Journal of Medical Screening 1999;6(3):144.

8. Gotzsche PC, Nielsen M.
Screening for breast cancer with mammography.
Cochrane Database Syst Rev 2009(4)

9. M.F.Reiser, Kaick Gv, C.Fink, S.O.Schoenberg, editors
Screening and preventive diagnosis with radiological imaging
Berlin: Springer, 2007

FEATURE : OPINION

Kia Kaha Christchurch

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Lisa is enjoying completing her final year at medical school and has been active in several student run initiatives throughout her training, including NZMSA conference 2010: Queenstown and NZMSJ.

Living through a major earthquake, and amidst a National State of Emergency, is definitely not part and parcel of completing your clinical years of medical school.

Or so I thought.

I first found out about the February 22nd earthquake on the way back from my elective, an hour or so after it had occurred. It was totally unreal. The first pictures I saw were of the bent and broken Cathedral; an international icon of the city I have gotten to know well over the two years I've spent here as a clinical medical student. Even though my loyalties will always lie with Dunedin, the city I grew up in, there was something gut wrenching about this image. The Tui billboard ran through my mind when my flatmate text me, "kitchen knee deep in silt" … Yeah Right, I thought. It took a while to actually sink in and most of us were living in a daze of this reality.

Despite all the chaos, the medical students who were in Christchurch at the time did a great job helping out in the hospital, the community, and most importantly, looking after each other. It is a massive credit to them all.

I came back to Christchurch, a city that looked like a war zone, shortly after February 22nd. The centre of town felt, and still feels, eerily like a ghost town; deserted and silent with a fine layer of silt coating it in a greyish tinge. Overtaking an army truck became a novelty. Having a curfew, not being able to shower, flush, or drink tap water, navigating horrendous traffic and a city in ruins have not. There has been a lot of destruction, and it continues, as Christchurch is made safe again. It is a strange feeling to drive to the supermarket past familiar buildings with walls missing, half standing as they wait for the bulldozer. It is even stranger the next time you pass by and all there is, is empty land.

We still do not have access to our beloved Medical School building. No library, common room, tutorial rooms, computer lab, Medici (the local café hangout), support staff on site, UBS, lecture theatres, lockers, or pathology museum; who knows what happened to the specimens. This, along with the 4th and 5th years' time off, has obviously had an impact on teaching and caused disruption to our learning environment. Our teaching staff are doing a great job despite all of this and working well beyond any specified job description to keep things on track. We do now have access to a temporary computer laboratory and a temporary common room, which in the future may be dubbed the 'dungeon' as opposed to the well-known 'den'. These have both made a big difference. CMSA in conjunction with the NZMSA held a free lunch to show their support for all the Christchurch students, and to say thanks for all the hard work they have done in the hospital and the community. This was well received by the students.

I'd like to put out an enormous thank you to everyone who has shown their support throughout this trying time, especially the students of the other schools around the country, the Christchurch School of Medicine, and all of our teaching staff.

I would like to say that even though the immediate trauma is over, the dead identified, the injured in rehabilitation and buildings demolished, a sense of the 'new normal' is washing over us and the scars are still maturing. Things are still far from normal and will be for some time. In fact, things will never be the same again. It is a credit to the medical school community in Christchurch that everyone has worked together to get through.

Lastly, Christchurch students, always remember that there's help if you need it. All you need to do is ask.