# Mammography for breast cancer detection in Hong Kong

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Hong Kong Med J 2016;22:200–1
DOI: 10.12809/hkmj164916

Breast cancer poses a significant health burden worldwide. It is the most common cancer in women with nearly 1.7 million new cases diagnosed globally in 2012.[1] Early detection reduces mortality and mammogram screening has been shown to achieve a mortality reduction of 25% to 28%.[2,3] Many countries have a breast screening programme, including the UK, Australia, Norway, Sweden, the US, Singapore, Japan, and Korea. Population screening for breast cancer remains controversial, however, especially the decision on whom, when, and how to screen due to different epidemiological characteristics of breast cancer in different populations. In Hong Kong, the incidence and mortality of Asian female breast cancer is lower compared with the Caucasian population. In the Surveillance and Health Services Research in 2013, the American Cancer Society published a lifetime risk of 1 in 8 for developing invasive female breast cancer,[4] similar to the findings of Cancer Research UK in 2010.[5] The median age at diagnosis of cancer was 61 years in 2006 to 2010 in these studies. In Hong Kong, breast cancer is the number-one female cancer with 3524 cases of invasive cancer diagnosed in 2013. The lifetime risk of female breast cancer before the age of 75 years was 1 in 17. Breast cancer in Hong Kong occurs at a younger age compared with the western population. The median age at diagnosis of breast cancer was 54 years.[6] Due to different tumour characteristics and the overall smaller size and denser fibroglandular tissue of Asian women's breasts, local epidemiology and clinical studies are important to facilitate our understanding of this common disease in Hong Kong. In this issue of the *Hong Kong Medical Journal*, studies conducted by Lau et al[7] and Chan et al[8] in Hong Kong provide valuable local data on this important topic.

Lau et al[7] compared the surgical outcome and pathology of breast cancer in self-detected and screen-detected women (physical breast examination, mammogram, or ultrasound) in their institute in Hong Kong. Several interesting aspects are raised. First, the screen-detected group had a smaller tumour of an earlier stage and lower grade with less lymph node involvement. This could imply that early detection may result in better prognosis. Previous studies have suggested reduced mortality with early breast cancer detection.[9] Less-invasive surgery is feasible such as breast-conserving surgery with better cosmetic outcome. Second, there was a trend towards increased detection of smaller tumours of <2 cm in the screen-detected group, likely explained by the advances in radiological imaging technology in mammogram and ultrasound. The self-detection trend remained static suggesting no significant change in skills throughout the study period. While the difference did not reach statistical significance, the trend could suggest a higher sensitivity of radiological imaging to detect small tumours. Third, the mean age at first diagnosis of breast cancer was 50 years (range, 24-92 years) and median age of 40 to 49 years in both the self-detected and screen-detected groups in this study. This is substantially lower than the median age of 54 years reported in the Hong Kong Cancer statistics in 2013[6] and the age of 61 years reported for the UK and the US in 2010.[4,5] Notably, the highest proportion of breast cancer was detected in the 40- to 49-year-old age-group in this study (38.6% and 43.5% of the self-detected and screen-detected group, respectively). A striking proportion of breast cancer was also detected in the 20- to 39-year-old age-group (16.6% and 7.0% in the self-detected and screen-detected group, respectively). This finding of breast cancer at younger age deserves further research and attention.

Chan et al[8] explored the impact of a radiolucent MammoPad (Hologic Inc, Bedford [MA], US) during mammogram on pain/comfort level, radiation dose, and image quality. Mammography involves breast compression in two or more views with radiation exposure. Discomfort and pain are often encountered during breast compression and may affect a woman's willingness to undergo a mammogram. In their study, most women (71%) experienced less pain, coldness, and hardness of the paddle with a better overall feeling. None of the patients reported additional discomfort with the pad. Women with less-dense breasts were more likely to experience more comfort with the pad. Age and breast size did not relate to the degree of discomfort during mammogram. Comparable image quality between the padded and non-padded side was noted in 92% of women.

While image quality difference was perceived in 4%, none was considered to have affected the diagnostic accuracy. Furthermore, glandular dose was 6.5% less in the mediolateral oblique view and 4.5% less in the craniocaudal view when a pad was used. Nonetheless, the role and efficacy of the MammoPad in diagnostic mammography was not determined in this study due to the exclusion of women with known carcinoma, scarring, or pathology detected by clinical breast examination. Further, the additional time required and cost of applying a single-use MammoPad may raise financial concerns in the setting of a publicly funded large-scale breast screening programme, unless the cost can be further lowered or pads can be recycled following effective sterilisation.

Despite agreement on the benefit of early cancer detection and treatment, debate about population-based breast cancer screening remains. The younger age of disease onset identified by Lau et al[7] deserves further attention as high breast density, associated with younger age and lower body mass index, reduces mammogram sensitivity. Newer technology such as digital breast tomosynthesis may provide higher sensitivity and increase cancer detection rate compared with digital mammography because of its ability to remove overlapping glandular tissue, the main reason for both false-positive and -negative results with traditional mammography.[10-14] Although tomosynthesis requires breast compression similar to mammogram, the compression force may be lower without affecting image quality.[14] Further studies would be helpful to determine whether the benefits of the MammoPad used by Chan et al[8] could have further benefit in tomosynthesis.

Hong Kong currently has no government-subsidised programme for breast cancer screening. Self-financed opportunistic screening is available mostly in the private sector. The suitability of breast cancer screening on a population-wide level in Hong Kong, including cost-effectiveness,[15] remains to be determined. Such a decision should be evidence-based and tailored to local epidemiology so that the benefits of screening outweigh the risks. In addition, the method of screening should be sensitive and suitable for the woman's breast density, age, and personal and family risk of developing breast cancer.

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