

Next-generation Breast Cancer Screening based on Ultrasonography: in order to reduce inequity in screening among Asian women with dense breasts

Breast cancer mortality has not been reduced in Japan despite more than 24 years of population-based screening mammography. Screening mammography must not be suitable for Japanese women who often have dense breasts, thus decreasing mammography sensitivity because of masking.

Many randomized controlled trials (RCTs) in Western countries showed statistically significant reduction of breast cancer mortality. Of course, RCTs are the most reliable form of scientific evidence in the hierarchy of evidence that influences healthcare policy and practice. However, it is nonsense to extrapolate the evidence of mammography screening based on Western women and apply it to Japanese women without critically appraising the evidence for its validity, especially external validity (generalizability). That's because many studies reported that Japanese women are more likely to exhibit high breast density than their Western counterparts and the decrease in mammographic sensitivity with increasing tissue density has been established. External validity or generalizability evaluates how closely the results of a study are applicable to other settings and patient populations. We must pay attention to the patient populations with whether dense or non-dense breasts in case of screening mammography. You can learn a lot of lessons from screening mammography for the past 24 years in Japan.

A > 70% participation rate and > 70% sensitivity for screening mammography are needed to get breast cancer mortality reduction from screening. The "one-size-fits-all" screening mammography promotes equality. Equality means providing everyone with the same amount of resources regardless of whether everyone needs them. In this situation, the needed sensitivity to get mortality reduction for women with dense breasts is really out of their reach. As a result, the "one-size-fits-all" screening mammography brings inequity in screening among women with dense breasts.

Breast radiologists can improve the sensitivity of their imaging techniques; however, participation rates are a more complex issue. Therefore, the focus should now shift toward developing more effective screening modalities and methods. Several supplemental breast cancer screening techniques, such as ultrasonography, digital breast tomosynthesis, and breast magnetic resonance imaging, have been suggested to improve the sensitivity and early detection rates of breast cancer in women with dense breasts. However, there is currently no global consensus advocating for the use of these supplemental breast cancer screening techniques in such women. For Asian women with smaller breast volume and relatively dense breasts, ultrasonography has been suggested as a potential supplementary

method for breast cancer screening, given the low sensitivity of mammography. Breast ultrasonography is the most cost-effective, convenient, readily accessible, and radiation-free method in breast imaging, and it eliminates the need for breast compression. The J-START study showed that supplemental ultrasonography not only increased the sensitivity and detection rate of early invasive cancers, but also reduced the occurrence of interval cancers in the intervention group compared to the control group for Japanese women in their 40 s. While mortality rates are the most significant parameters for assessing the effectiveness of supplemental breast ultrasonography screening, the preliminary results from the J-START are crucial in guiding women with dense breasts in their choice of personalized breast cancer screening. I believe that a personalized breast cancer screening approach using ultrasonography presents the most realistic solution to help reduce inequity in breast cancer screening among Asian women with dense breasts. This can only be achieved if we supply and demand equity in breast cancer screening. Next-generation breast cancer screening in Asian women with dense breasts should consist of supplemental breast ultrasonography to address the problem of false-negative mammograms attributable to dense breasts. Join the movement and take action on this.