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Review

Breast cancer research in Asia: Adopt or adapt Western knowledge?

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Abstract The incidence and mortality of breast cancer continues to rise rapidly in Asian countries. However, most of our current knowledge on breast cancer has been generated in Western populations. As the socio-economic profile, life style and culture of Asian and Western women are substantially different, and genetic backgrounds vary to some extent, we need to answer the question on whether to 'adopt' or 'adapt' Western knowledge before applying it in the Asian setting.

It is generally accepted that breast cancer risk factors, which have mainly been studied in Western populations are similar worldwide. However, the presence of gene–environment or gene–gene interactions may alter their importance as causal factors across populations. Diagnostic and prognostic study findings, including breast cancer prediction rules, are increasingly shown to be 'setting specific' and must therefore be validated in Asian women before implementing them in clinical care in Asia. Interventional research findings from Caucasian patients may not be applicable in patients in Asia due to differences in tumour biology/profiles, metabolism of drugs and also health beliefs which can influence treatment acceptance and adherence. While breast cancer research in Asia is warranted in all domains of medical research, it is felt that for Asian breast cancer patients, needs are highest for diagnostic and prognostic studies. International clinical trials meanwhile need to include breast cancer patients from various Asian settings to provide an insight into the effectiveness of new treatment modalities in this part of the world.

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1. Introduction

In the past few decades, Asia has seen rapid economic growth resulting in increasing life expectancy, declining mortality from communicable diseases and westernisation of lifestyle.[1] While these developments are overall beneficial, they come with a price. Breast cancer incidence is rapidly increasing in Asian populations. In China and India, incidence rates have increased by up to 30% over the last 10 years, whereas in Japan, Korea and Singapore, the rates have doubled or even tripled in the past few decades.[2] The age-standardised incidence of breast cancer in Singapore, for instance, had increased from 20.2 per 100,000/year between 1968 and 1972,[3] to 60.7 per 100,000/year between 2006 and 2010,[4] where much of this is attributed to the decline in parity and delayed first childbirth in Singaporean women.[5] While the incidence of breast cancer in Asian women is currently still lower than in their Western counterparts across all age groups (Fig. 1),[6] the dramatic increase of incidence rates in Asian populations renders it conceivable that in the near future, the majority of breast cancer patients worldwide will be of Asian ethnicity.

Most of our current knowledge on breast cancer has been generated from studies conducted in Western populations. Hence, diagnostic and treatment guidelines in Asia are largely based on Western knowledge. For instance, the recent consensus guideline on the management of HER2-positive breast cancer in Asia was based only on studies conducted in non-Asian populations.[7] The question is whether we can simply adopt current Western knowledge in Asia, whether we have to adapt it before implementation, or whether we need new evidence. Central to this issue is that Asian women are substantially different from Western women from many perspectives, including genetic background, socio-economic profile, lifestyle, culture and health beliefs, all of which play an important role in breast cancer incidence and prognosis.[8] Below, we use some research examples to support our views on which areas require adopted, adapted or *de novo* Asian breast cancer research.

2. Aetiological breast cancer research

While it is generally accepted that the aetiology of breast cancer is similar worldwide, differences in genetic make-up of Asian women may cause different interactions with environmental exposures (e.g. reproductive, dietary), altering their susceptibility to the beneficial or harmful effects of these exposures. A meta-analysis investigating the association between soy intake and breast cancer risk had shown that the protective effect of soy was observed only in women of Asian ethnicity (Asian or Asian Americans), whereas soy intake was unrelated to breast cancer risk in Western women.[9] A nested case control study within the Singapore Chinese Health Study cohort revealed that the protective effect of dietary soy isoflavones on postmenopausal breast cancer was restricted to women who were homozygous for the high activity murine double minute 2 (MDM2) allele

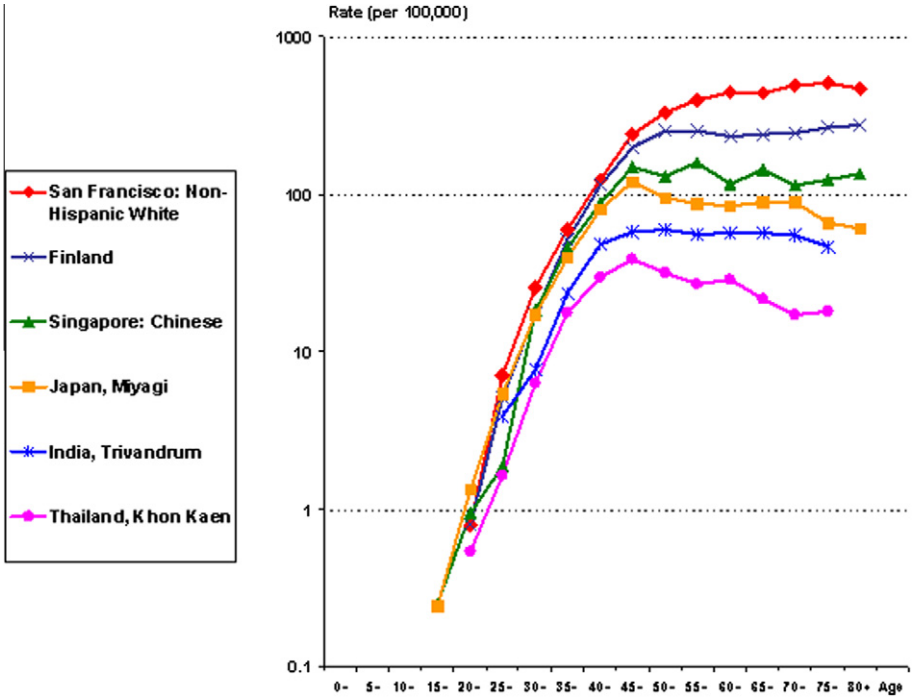

Fig. 1. Age-specific breast cancer incidence rates in selected cancer registries. Source: Bray et al.[6] (Reproduced with permission from Freddie Bray, International Agency for Research on Cancer).