Risk Stratification of Breast Cancer.

Ever since the first reference was made in The Edwin Smith Surgical Papyrus dating back to 1600 BC, number of developments has taken place in understanding and management of breast cancer. Until recently, the primary message of Breast health awareness programs has been that early detection is a woman's best protection against breast cancer. But, with the availability of additional screening and prevention options for women at different levels of risk, breast cancer risk stratification in becoming increasingly popular.

The risk factors associated with breast cancer are grouped into different categories like familial/hereditary (family history, known or suspected BRCA1/2, TP53, PTEN or other known gene mutations associated with breast cancer risk); factors related to demographics (e.g. age, race/ethnicity); reproductive history (age at menarche, parity, age at first live birth and age at menopause); environmental factors (prior) history of irradiation before the age of 30, hormone therapy and alcohol consumption); and other factors (numbers of biopsies, atypical hyperplasia or lobular carcinoma in situ, breast density, body mass index). Based on these risk factors number of risk prediction models exists but none of them is perfect and each has its own limitation. Mitchell Gail developed one of the earliest models in 1989[1]. Though, this model is most commonly used, there are certain major limitations of this model-i) predicted risk increases substantially with the number of previous breast biopsies upto two-irrespective of pathology and ii) it only accounts for first degree relative with breast cancer and does not make any adjustment for age at diagnosis. Therefore, to overcome the limitations of gail model and to incorporate the other breast cancer related risk factors including BRCA1/2 mutations-Claus[2], IBIS by Tyrer and Cuzick[3], and other models were introduced. BRCAPRO and BOADICEA are currently used to estimate the risk based on BRCA mutations[4,5] and more recently breast density is recognized as a tool to assess cancer risk[6]. As none of these models takes in to consideration all known risk factors, no single model is appropriate in all circumstances. Some of these models may underestimate while others may overestimate the risk. To provide patient with best estimate of risk may therefore require use of more than one model and resulting risk needs to be evaluated keeping in mind the known limitation of each model. Breast cancer risk estimates are currently being used to determine which patients may benefit from screening with breast MRI, use of tamoxifen as chemoprevention on surgical risk reduction strategies like bilateral salpingoopherectomy or prophylactic mastectomy and genetic counseling/ testing. The role MRI in addition to routine mammography in detecting early lesions in high-risk women is now well established. It was outcome of the first large scale chemoprevention trial conducted in the United States, the NSABP P-1, that necessitates the need to evaluate breast cancer risk as standard of acre. This trial showed that tamoxifen lowered the breast cancer risk by 49%[7]. Further trails are underway to evaluate other medications that may decrease the risk of breast cancer. Data is also available regarding the efficacy of surgical strategies to reduce breast cancer risk. However, women who are being considered for interventions to reduce risk of breast cancer must be counseled about the demonstrated benefits with potential morbidities of the interventions, as surgical risk reduction strategies may have psychosocial consequences and drugs like tamoxifen is associated with certain adverse effects like endometrial cancer. The risk threshold required for a woman to consider the use of risk reduction therapy therefore must depend on an evaluation of efficacy, morbidity and expense of proposed intervention. Determining the net risk/benefit ratio in turn depends on the ability to quantify accurately a woman's likelihood of developing breast cancer.

Although, breast cancer risk estimation is now a part of standard care in west but, developing countries like India still has to cover a long way in this direction. Lack of awareness because of illiteracy, poverty and access to health care programs is major hindrance. It has been four decades since mammography was introduced as a screening tool to detect non-palpable lesions, but still studies suggest that majority of patients present with advanced stage of the disease. Limited data on the role various risk factors for breast cancer in Indian women, is another reason. No single risk assessment model exists which is based on risk profile of Indian women. Also, the cost of testing and limited knowledge of prevalence of gene mutations responsible for breast cancer in Indian women limits the detection of familial/hereditary breast cancer.

To conclude, it is important to incorporate preventive measures of breast cancer as incidence of affected individuals is rising. Options for breast cancer risk assessment continue to evolve, and risk reduction strategies will expand as well. But for these to be really effective, in optimizing breast cancer screening and prevention, adequate awareness of the population is very essential.

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I wish to express my gratitude for the help and guidance received from the Members of Board of Trustees and the Central Executive Committee members, of International Medical Sciences Academy, World Headquarters, New Delhi. I am also grateful for the valuable cooperation extended by the members of JIMSA Editorial and Advisory Boards; and also the peer reviewers, for their consistent and continuous effort and support to maintain a high standard of quality of the articles published in the journal. Friends, this is an important milestone in the history of our journal; this will broaden accessibility to all published articles. The journal should now attract original articles of even better quality. We should enforce rigorous peer review of the submitted articles and also on time publication of the issue, every quarter.

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