Increasing Global Burden Of Breast Cancer

As we begin a new decade, we are faced with the increasing global burden of cancer. It remains an unresolved widespread factor for increased mortality and morbidity of human beings. This in turn impacts social life and the economy. The GLOBOCAN database, compiled by the International Agency for Research on Cancer (IARC), provides estimates on national cancer incidence and mortality [Ferlay2019]. In India, according to the Globocan 2018 report, breast cancer has the largest number of new cases (27.7 percent) as against the world incidence rate of 24.7 percent. The last decade has seen an intensified research efforts in the field of prevention and early detection of this disease. As the wave of rapid urbanization sweeps India one observes drastic changes in dietary habits and lifestyle causing at times high-stress levels. Studies in high-income countries have indicated that from one-third to two-fifths of new cancer cases could be avoided by eliminating or reducing exposure to known lifestyle and environmental risk factors [Bray2018].

The risk factor for most cases of breast cancer is due to a combination of factors which are genetic and environmental. Breast cancer detection after clinical examination includes two tests, namely Breast Imaging and Breast Histopathology. Early detection and diagnosis are crucial. This is possible by effective and efficient screening programs. Early diagnosis of cancer in its natural history, before it spreads regionally or to distant organs can result in a higher probability of the longer number of survival years [3]. One of the commonly used imaging modalities for early breast cancer detection is mammography. Here an abnormality is categorized as either normal, noncancerous (benign), or cancerous (malignant). Screening mammography reduces breast cancer mortality by about 20% to 35% in women aged 50 to 69 years and slightly less in women aged 40 to 49 years. Some of the methods include screen-film mammography and full-field digital mammography. For diagnostic purposes, methods such as Magnetic Resonance Imaging (MRI), ultrasound, scintimammography, thermography, and electrical impedance imaging may be used. Breast cancer screening has potential limitations and harms which include false-positive, false-negative test results, and overdiagnosis [Elmore2005].

Presently, full-field digital mammography (FFDM) is rapidly being replaced by digital breast tomosynthesis (DBT, also called 3D mammography). An independent risk factor for breast cancer is breast density. It results in reduced mammographic accuracy because of masking and superimposition of dense tissue. Hence there is a need for supplemental imaging to improve the sensitivity of screening in women with significant mammography breast density [Wender2019]. Mammographic breast density is visually assessed by radiologists in routine mammogram image reading, using four qualitative Breast Imaging and Reporting Data System (BI-RADS) breast density categories. However, it is difficult for radiologists to consistently distinguish the two most common and most variably assigned BIRADS categories, i.e., “scattered density” and “heterogeneously dense”.