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Archives of Cancer Biology and Therapy Commentary

Genetic Predisposition of Breast Cancer in the United Arab Emirates

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This commentary refers to our published article, as highlighted in this article most common gene causing breast cancer in the population living in the United Arab Emirates is BRCA2 followed by BRCA1 [1]. This is the first publication discussing about clinical and pathological features of breast cancer in woman with a positive genetic mutation in the United Arab Emirates. The UAE has a rising population of a mixed ethnic population with predominantly Arabic background. Breast cancer (BC) is the most common cancer in the UAE according to GLOBOCAN statistics in 2020 [2]. Despite the rise in cancer, there is less published data about genetic predisposition in breast cancer in this part of the world.

Consanguineous marriages are very common among the Arab communities in about 25-60%, with common first cousin marriages. Accordingly, genetic disorders occur at a high frequency due to high rates of inbreeding [3]. There is lack of education in community and public health measures directed towards prevention of genetic disorders. Advances in sequencing technologies have permitted the discovery of novel genes responsible for cancer heritability. There are multiple technologies that can permit identification of those at risk benefiting enhanced surveillance and early detection. Not all patients with cancer syndromes develop cancers, but awareness of their status can enable early detection to prevent morbidity and mortality [4].

In the UAE, most common genetic mutations involving breast cancer were BRCA1 and BRCA2 in patients from Middle East and Asian ethnic background [5]. Around 40% of patients who have a gene panel assay are showing variant of uncertain significance (VUS) genes. Although, most VUS patients are usually benign; a repeated gene panel assay should be recommended as management can differ.

In the neighbouring countries of the UAE, the Gulf Cooperation Council (GCC), mutations were found mainly in BRCA1/2 genes and also in more than 30 non-BRCA1/2 genes associated with breast cancer [6]. The GCC has a similar mixed ethnic population with predominantly Arabs. In the Kingdom of Saudi Arabia (KSA), breast cancer was diagnosed at an early onset possible due to predisposing genetic factors due to high rates of consanguineous marriage [7]. Several single nucleotide variations in either novel or rare genes involving in the BRCA1/2 pathway were detected [7]. Multiple genes were detected in Qatar during 2013 to 2018 that are associated with breast cancer, similar to many studies BRCA1 was the most common mutation detected, followed by BRCA2 [8]. Similarly, BRCA1 mutations were mostly associated with hereditary breast cancer in Oman and Bahrain [9,10].

Clinical and pathological characteristics for breast cancer patients with associated genetic mutations are similar to patients with sporadic breast cancer. The median age in Arab population is about 48 years, and about two-thirds of women are younger than 50 years [2,5]. Breast cancer screening is recommended at age of 40 years for low-risk population in the UAE. There are recommendations that breast cancer screening should commence at 30 years of age, as the population in the UAE is diagnosed with breast cancer a decade earlier compared to Western population [11]. Arab patients with breast cancer present at an advanced stage of disease [6]. From our data it revealed that BRCA1&2 patients were more likely to have invasive ductal carcinoma with axillary lymphadenopathy. In BRCA1 most

common subtype was found to be triple negative, on the contrary to BRCA2 which was most likely ER/PR positive with Her2 negative cancer. A positive family history was very common among Arabs with BRCA1&2. Although; patients who were unaffected form genetic mutations also had significant family history, which suggest genetic testing should not be based on family history alone [8].

Detecting genetic mutations can change management for most breast cancer patients, as well for their families. In our centre genetic testing is offered for patients with established breast cancer diagnosis according to NCCN guidelines.

Further studies about genetic mutations in the UAE for breast cancer is encouraged. This could impact genetic counselling after a germline mutation is detected, with risk reduction strategies such as breast MRI for early detection, chemoprevention, and prophylactic oophorectomy and/or mastectomy.

Conflict of Interest

All authors declare no conflict of interest.

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