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Variation of biomarkers and molecular subtypes of breast cancer among the German and Sudanese women

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Breast cancer is less common in African women compared to the west. However, it is considered to be more aggressive in terms of clinical tumor markers and more often hormone receptor negative in contrast to white women. It is also highlighted that more aggressive molecular subtypes of breast cancer are dominant in African Americans and indigenous African women. The existing studies in Africa still show heterogeneous results in the proportion of hormone receptors, HER2 expression and their derived molecular intrinsic subtypes. There are only few studies that directly compared breast cancer in black African women and Caucasian women in the west.

Aim: The objective of this study was to compare and contrast the tumor characteristics, biomarkers and molecular subtypes of breast cancer among the Sudanese and German women.

Method: Tumor characteristics and tumor markers (ER, PR and HER2) were collected from the routine assessment of both institutions; Gezira University Pathology Laboratory for Sudanese case series and Martin Luther University, Department of Gynaecology, breast unit for the German women in order to make comprehensive comparison.

Results: A total of 2492 (1932 German and 560 Sudanese) cases were included in the study. The age ranged from 20-90 and 23-94 with a mean age at diagnosis (+SD) 48.8 (+13.5) and 58.6 (+12.4) years for Sudanese and German patients, respectively. The Sudanese women had higher grade, large tumor size and more lymph node positive compared to the German women. The Sudanese cases had two times higher risk to develop ER negative breast cancer with odds ratio 2.01 and p=0.0001 (adjusted for age, tumor size, nodal status, histologic type and grade). This influence of origin was mainly seen in low grade one and grade two tumors and not in grade three tumors. The ER, PR, HER2 positive rates for Sudanese women were 45%, 38.2%, and 28.7% versus 77.3%, 67.7% and 17.5% for German women. The triple negative subtype was more dominant in Sudanese women (34.5%) in contrast to the German women (14.2%).

Conclusion: The Sudanese women are 10 years younger at diagnosis and have more aggressive tumor characteristics and poor prognostic biomarkers. After adjusting for confounders, they still have a higher risk for hormone receptor negative disease, this occurs mainly in the grade one and grade two tumors. Sudanese women more often show HER2 overexpression and receptor negative tumors. This study suggests the breast cancer in Sudanese women could have distinct biologic behavior that needs meticulous investigation.

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