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BREAST CANCER: MOLECULAR CLASSIFICATION USING IMMUNOHISTOCHEMICAL EXPRESSION AT THE NATIONAL HEALTH LABORATORY SERVICE (NHLS), CHARLOTTE MAXEKE JOHANNESBURG ACADEMIC HOSPITAL (CMJAH), JOHANNESBURG.

ABSTRACT

Background: Breast cancer is a heterogeneous disease, and the current histological classification fails to differentiate cancers with the same histologic patterns that may biologically behave differently. Accurate grouping of breast cancers into clinically relevant molecular subtypes is essential for therapeutic/oncologic decision making and optimal patient care. We set to use immunohistochemistry (IHC), an affordable, fast method that requires no ultra-specialised laboratory facilities to determine the molecular subtypes of breast cancer and their distribution in our population group at Charlotte Maxeke Johannesburg Academic Hospital (CMJAH), National Health Laboratory Service (NHLS), Johannesburg.

Methods: A Systemised Nomenclature of Medicine based search was performed to retrieve all diagnosed cases of breast cancers (on core biopsies) over one year on the database of the NHLS histology laboratory at Charlotte Maxeke Johannesburg Academic Hospital. The search included the period from January 1, 2019, to December 31, 2019. The following data was extracted from the histology reports and captured – Age, tumour grade, histological subtype and IHC expression of Estrogen Receptor (ER), Progesterone Receptor (PR), Human Epidermal Growth Factor Receptor 2 (HER-2) and Ki67 proliferative index. Medians and inter-ranges (IQR) for continuous variables showed skewed distribution. Frequencies and percentages were used to summarise the distribution of categorical variables, whereas the median and interquartile range were used for continuous variables.

Results: A total of 265 diagnosed cases of breast cancers on core biopsies were available for analysis. The median age was 53 years (IQR 41-63), and 53% (n=140) were aged >50 years. Most tumours were either in the grade 2 or grade 3 category, 49.4% (n=131) and 44.5% (n=118) respectively. Per histological classification, the invasive breast cancer of no special type (IBC, NST) was by far the commonest (n=236, 89.1%), and approximately 8% (n=20) had invasive breast carcinoma of special type. Histological subtype differed by median age and tumour grade: patients with invasive lobular carcinoma had the highest median age, p=0.030 and having IBC, NST was associated with advanced tumour grade (p=0.004). The molecular subtype classifications of the breast cancers were as follows: Luminal B was the highest (n=113, 42.6%), followed by Luminal A (n=79, 29.8%), Basal (n=50, 18.9%), and the smallest proportion was in the HER2 overexpression group (n=23, 8.7%). The age group distribution was not different across the molecular subtypes (p=0.377), but the molecular subtype differed by tumour grade (p<0.001). The proportion of patients with IBC, NST, who had advanced tumour grade was significantly higher than that for the IBC, ST subtype, 46.2% vs 31.0%, p=0.017.

Conclusion: Based on the findings of this single centre study in South Africa, the aggressive molecular subtypes of breast cancer were not the predominant types. In our setting, presentation to care is often late, thus scaling up early diagnosis and treatment may help improve breast cancer management outcomes, including survival in low-income countries like South Africa.