Original Article

Triple Negative Receptor Status in Patients Diagnosed with Carcinoma Breast

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ABSTRACT

Objective: To evaluate the frequency of triple negative receptor status in patients diagnosed with breast carcinoma.
Study Design: Cross sectional study
Place and Duration of Study: This study was conducted at the Surgery Department of Nishtar Hospital, Multan from July 2022 to June 2023 in duration of one year.
Methods: A total of 180 patients having age 30-60 years who were presented with suspicion of carcinoma breast were enrolled in study. Data was evaluated and analyzed on IBM SPSS version 23. Chi-square with probability value 0.05 was applied to see association among variables. Demographic and clinical data (age, family history of TNBC, menopausal status and TNBC presence) were presented as mean standard deviation and frequency percentages.
Results: Mean age and size of tumor were 43.46 ± 8.38 and 2.52 ± 0.025 respectively. Triple negative receptor status (TNBC) is the main outcome variable of study which was 21.2% was having TNBC. Menopausal status was positive in majority of patients 77.7%, family history of TNBC was present in 20% patients. Patients were classified in 3 groups according to their status of age, 38.8% patients were having age between 30-40 years, 74 (40.4%) were between 41-50 years and 20.8% between age 51-60 years.
Conclusion: Breast cancer is a concerning issue, especially for younger women. TNBC is a estrogen, HER2 and progesterone receptor lacking subtype of breast cancer.

Key Words: Carcinoma breast, Ductal carcinoma in situ, Metastasis, Triple negative breast cancer.

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INTRODUCTION

Worldwide breast cancer is challenging health problem for female gender. It is one of the leading causes of death among women, although advances in early detection and treatment have improved survival rates in recent years[1]. In the United States, breast cancer is the second most common cause of cancer-related deaths among women, following lung cancer. It accounts for approximately 29% of all cancer cases in women[2].

Breast cancer is a complex disease that can be classified into different subtypes based on its molecular and genetic characteristics[3]. One of the ways to classify breast cancer is through the use of immunohisto-chemical biological markers like progesterone, human epidermal growth factor receptor 2 (HER2) and estrogen[4]. These biomarkers help in determining the appropriate treatment plan for patients. St. Gallen introduced an adjuvant therapy of trastuzumab, endocrine and chemotherapy for breast cancer of primary stage that was based on HER2, PR and ER receptor expression. This approach has been successful in improving the survival rates of breast cancer patients[5,6].

TNBC is a particularly aggressive subtype of breast cancer that is negative for the hormone receptors estrogen and progesterone, as well as the HER2 protein[7]. This means that it cannot be treated with targeted therapies that specifically target these receptors or proteins. Instead, the main treatment options for TNBC include chemotherapy, radiation therapy, and surgery[8]. However, researchers are currently exploring new treatment options for TNBC, including immunotherapy and targeted therapies that work by blocking specific pathways involved in cancer growth and spread[9].

TNBC has a similar metastatic property as other subtypes, but it can proliferate and lead to death in a shorter time period. TNBC is diagnosed in about 10-20% of all breast cancer cases and is more common in young premenopausal females[10]. The frequency of breast cancer varies globally due to factors such as genetic variations, environmental factors, and living status. For example, the incidence of breast cancer in Mozambique is 3.9/100,000 compared to 101.1/100,000 in the US[11].

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Limited studies were conducted on this topic on Pakistani population especially south Punjab region. This study will fulfill the local reference gap in literature and also will help further research in this area.

METHODS

Study was started after ethical approval from hospital board of ethics and written consent from patients or their guardians. Patients were described in detail about study purpose and ensured about their confidentiality. Sampling technique used was non probability consecutive. Sample size of 180 patients was calculated with 18.7% proportion of TNBC, confidence interval 95% and 5% absolute precision. Newly diagnosed cases of cancer having age 30-60 years were included in the study. Previous history of breast surgery, male gender and who refused to give consent were excluded from study.

Physical examination and history was taken from all patients, biopsy sample was taken and sent to laboratory for immunohistochemistry for evaluation of HER2, PR and ER receptors. Triple negative breast cancer stage was also labeled. All specimens were analyzed by a histopathologist having minimum 5 years expertise in this field.

Data was evaluated and analyzed on IBM SPSS version 23. Chi-square with probability value 0.05 was applied to see association among variables. Demographic and clinical data (age, family history of TNBC, menopausal status and TNBC presence) were presented as mean standard deviation and frequency percentages.

RESULTS

A total of 180 female patients, mean age and size of tumor were 43.46 ± 8.38 and 2.52 ± 0.025 respectively.

Table No.1: Demographics (n=171)

Characteristics	Frequency	Percentage (%)
Age	43.46 ± 8.38	
Tumor size	2.52 ± 0.025	
TNBC		
Yes	38	21.2
No	142	78.8
Menopausal Status		
Yes	140	77.7
No	40	22.3
Family History		
Yes	36	20
No	144	80
Stratified Age		
30 to 40 yrs	70	38.8
41 to 50 yrs	74	40.4
51 to 60 yrs	36	20.8

Triple negative receptor status (TNBC) is the main outcome variable of study which was 21.2% (n=38) were having TNBC. Menopausal status was positive in majority of patients 140 (77.7%), family history of TNBC was present in 36 (20%) patients. Patients were classified in 3 groups according to their status of age, 70 (38.8%) patients were having age between 30-40 years, 74 (40.4%) were between 41-50 years and 36 (20.8%) between age 51-60 years. It was observed TNBC associated strongly with previous family history as P values was <0.03. But there was no significance between TNBC and menopausal status as P values was >0.77.

Table No. 2: Association of TNBC and menopause

Menopausal Status	TNBC		Total
	No	Yes	
No	30	9	0.77
Yes	110	28	
Total	140	37	

Table No.3: Association of TNBC and family history

Family History	TNBC		Total
	No	Yes	
No	111	33	0.033
Yes	33	3	
Total	144	36	

DISCUSSION

Among female gender breast cancer is leading cause of mortality worldwide. Its incident varies with age and regional demographics. In this study triple negative receptor status (TNBC) was mainly assessed which was found in 21.2% patients. The study conducted by Patil VW et al[12] on triple-negative breast cancer (TNBC) in the Indian population included a sample size of 683 patients. The researchers found that out of these patients, 136 (19.92%) had positive TNBC, meaning they tested negative for progesterone, human epidermal growth factor receptor 2 (HER2) and estrogen.

In this study mean age of patients was 43.46 ± 8.38 years. In a study Khan et al[13] reported 17.2% TNBC ratio and mean age was 46.26 ± 12.22 years in Pakistani population which is almost same as mentioned in global reports. Another Canadian study by Sajid et al[14] reported mean age below 53 years 11.2% TNBC proportion. Most common subtype was basal like TNBC and commonly 90% found in American and African countries.

Marwan et al[15] found that TNBC was present in 9.3% of their study population, with a median age of 52 years. In this study, 85% of TNBC cases were invasive ductal carcinoma, while medullary carcinoma and invasive lobular carcinoma accounted for 5% each. Positive family history of TNBC was reported in only 9% of patients. Another similar study by Tanja et al[16] observed that most of postmenopausal women about

60.3% at the time of presentation were falling under category of 3rd grade of TNBC about 82.5%, tumor size above 2 cm was observed in 59% of patients.

Ductal carcinoma in situ in association with TNBC was also evaluated by Thika et al[17] and reported 97.9% association with progesterone receptors and estrogen receptors. Studies by Dawson et al[18] and Gluz et al[19] highlight the heterogeneity of triple-negative breast cancer (TNBC) and suggest that the worst prognosis may be mainly associated with a subset of TNBC that express basal cytokeratins or epidermal growth factor receptor (EGFR). A Research has reported that TNBC tumors often have larger sizes at the time of diagnosis, which can be attributed to the aggressive nature of this subtype. TNBC tends to grow more rapidly and may be associated with a higher proliferation rate compared to other subtypes.

In another study Amna et al[20] concluded that breast cancer, especially triple negative disease, has been found to affect younger age groups. This type of cancer is known for its aggressive nature and lack of targeted treatment options.

CONCLUSION

Breast cancer is a concerning issue, especially for younger women. Triple negative breast cancer is a subtype of breast cancer that lacks estrogen, progesterone, and HER2 receptors. Unfortunately, patients with this type of cancer tend to present at advanced stages of the disease, making treatment more challenging.

Recommendations: Further studies on larger sample size and multi-centered concept are required for exact estimation of TNBC frequency and its association with other dependant variables.

Author's Contribution:

Concept & Design of Study:	Shabbir Ahmed, Bushra Ghulam
Drafting:	Verdah Azam, Sumta Khan
Data Analysis:	Sumera Nighat, Tahira Atiq
Revisiting Critically:	Shabbir Ahmed, Bushra Ghulam
Final Approval of version:	By all above authors

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