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Clinicodemographic Characteristics of Bangladeshi Women with Triple-Negative Breast Cancer

Prianka Saha[1*], Tonmoy Burmon[2], Tahrima Tabassum[3], Shanjana Naj Swarna[4], Mohammad Ismail[5], Nur A Farhana Islam[6]

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*Corresponding author

ABSTRACT

Background: Triple-negative breast cancer (TNBC) is an aggressive subtype of breast cancer with a lack of expression of estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor-2 (HER-2). It disproportionately affects younger women and has been linked to poor prognosis and treatment options. This study aimed to describe the clinicodemographic characteristics of Bangladeshi women diagnosed with TNBC. **Methods & Materials:** This cross-sectional descriptive study was conducted at the Biochemistry department of Dhaka Medical College in collaboration with Bangladesh Medical University from January 2022 to December 2022. 68 female patients with histopathologically confirmed TNBC were recruited through purposive sampling. Data were collected on age, body mass index (BMI), contraceptive use, obstetric history (parity), and family history of breast cancer. Descriptive statistics such as frequencies, percentages, and mean ± standard deviation were utilised for analysis. **Results:** The mean age of the patients was 43.71 ± 9.84 years, and the highest proportion (20.6%) was in the age group of 41-45 years. Mean BMI was 23.95 ± 3.38 kg/m². Oral contraceptive use was reported by 47.1% of patients, and 47.1% had never used any form of contraception. Multiparity was the most common obstetric profile (70.6%). Family history of breast cancer was present in only 5.9% of the patients, suggesting that most cases were sporadic in nature. **Conclusion:** TNBC in Bangladeshi women mainly affects women in their fourth and fifth decades, and multiparity and oral contraceptive use are notable in the women's associated features. The mostly sporadic nature of TNBC in this population suggests the need for population-level screening and awareness programmes.

Keywords: *Triple-negative breast cancer; Clinicodemographic characteristics; Oral contraceptive use*

1. *Assistant Professor, Department of Biochemistry, TMSS Medical College, Bogura, Bangladesh (ORCID: 0009-0007-4657-6530)*
2. *Assistant Professor, Department of Transfusion Medicine, Shaheed Ziaur Rahman Medical College, Bogura, Bangladesh*
3. *Lecturer, Department of Biochemistry, Shaheed Tajuddin Ahmad Medical College, Gazipur, Bangladesh*
4. *Assistant Professor, Department of Biochemistry, City Medical College, Gazipur, Bangladesh*
5. *Assistant Professor, Department of Biochemistry, Cox's Bazar Medical College, Cox's Bazar, Bangladesh*
6. *Professor, Department of Biochemistry, TMSS Medical College, Bogura, Bangladesh*

INTRODUCTION

Breast cancer is the most frequently diagnosed cancer among women worldwide. It remains a major cause of cancer-related mortality. Within this heterogeneous disease spectrum, triple-negative breast cancer is defined by the absence of estrogen receptor, progesterone receptor, and human epidermal growth factor receptor 2 expression. This represents an important clinicobiological subtype because of its aggressive course and distinct therapeutic limitations [1-4]. Unlike hormone receptor-positive or HER2-positive tumors, TNBC does not benefit from endocrine therapy or HER2-directed treatment. Systemic chemotherapy remains the principal backbone of treatment in many settings [3-5].

Globally, TNBC accounts for 10% to 15% of breast cancers, though frequency varies by population [3-5]. In Asia, breast cancer's burden has increased, and the region now has a large share of global cases [1,2]. South Asian data suggest TNBC forms a higher proportion of breast cancers compared to many Western populations. In India, systematic reviews and meta-analyses estimate pooled TNBC prevalence at 27%-31%, suggesting a greater regional burden of aggressive disease [6,7]. These findings make South Asian, especially Bangladeshi, data vital for understanding population-specific TNBC patterns [2,6,7]. The clinical relevance of TNBC extends beyond its epidemiological proportion. TNBC is commonly associated with younger age at presentation, higher histological grade, nodal involvement, early relapse, and poorer prognosis compared with other molecular subtypes [5,7]. Recent advances in immunotherapy, poly (ADP-ribose) polymerase inhibition, and other targeted approaches have improved outcomes for selected patients. However, these strategies depend on biomarker testing, drug availability, and health-system capacity. Such resources may be inconsistent in low- and middle-income countries [6-9]. Consequently, careful characterization of clinicodemographic patterns remains highly relevant. This is especially true in resource-constrained settings where delayed presentation and restricted treatment access may amplify the adverse biology of TNBC [5,8,9].

In Bangladesh, breast cancer affects women at comparatively younger ages. Available studies indicate that TNBC may represent a substantial subgroup [10-13]. A hospital-based study from NICRH, Dhaka found TNBC in 27.5% of molecularly classified breast cancers. The same study reported a mean patient age of 43.4 years [10]. Another Bangladeshi study reported that women with TNBC had a mean age of 43.8 years. Lymph node metastasis was present in nearly three-quarters of cases [13]. However, the available evidence remains fragmented, being derived largely from single-center, hospital-based, or subtype-focused studies with limited sample sizes and variable emphasis on demographic, reproductive, and tumor-related characteristics [10-13].

This knowledge gap has practical implications. In settings such as Bangladesh, where awareness, early detection, and timely treatment remain challenging, stronger local evidence on the clinicodemographic profile of TNBC could support earlier clinical suspicion, more contextually appropriate counselling, and more rational service planning [10-13]. It could also provide a baseline for future translational, prognostic, and multicenter outcome research. Therefore, the aim of the present study was to assess the clinicodemographic characteristics, including age distribution, BMI, contraceptive use, obstetric history, and

family history of Bangladeshi women diagnosed with TNBC at a tertiary care centre.

METHODS & MATERIALS

This cross-sectional descriptive study was conducted in the Department of Biochemistry, Dhaka Medical College, in collaboration with Bangladesh Medical University, from January 2022 to December 2022. Female patients with a histopathologically confirmed diagnosis of breast carcinoma were initially identified, and the diagnosis of triple-negative breast cancer (TNBC) was subsequently confirmed by immunohistochemistry (IHC), defined as estrogen receptor (ER)-negative, progesterone receptor (PR)-negative, and human epidermal growth factor receptor-2 (HER-2)-negative status. Patients with incomplete medical records, those who refused to participate, those with a history of other malignancies, or those with incomplete immunohistochemical evaluation were excluded from the study. A total of 68 eligible patients were recruited using purposive sampling. Data were collected through structured interviews and review of clinical records using a pre-designed data collection form. The independent variables assessed included age (categorised in 5-year intervals and expressed as mean ± SD), body mass index (BMI, kg/m²), type of contraceptive used (oral, injectable, implant, or none), obstetric history (classified as nullipara, primipara, or multipara), and family history of breast cancer among first-degree relatives. Ethical approval for the study was obtained from the Institutional Review Board (IRB) of Dhaka Medical College. Written informed consent was taken from all participants before data collection, and confidentiality of patient information was strictly maintained throughout the study. Data were entered and analysed using SPSS version 26. Descriptive statistics were applied throughout the analysis. Categorical variables were presented as frequencies and percentages, while continuous variables, namely age and BMI, were expressed as mean ± standard deviation (SD). No inferential statistical tests were performed in accordance with the descriptive nature of the study.

RESULTS

Table I shows the age distribution and the mean BMI of the 68 TNBC patients. The largest proportion of patients (20.6%) was in the 41-45-year age bracket, with a mean age of 43.71 ± 9.84 years, indicating that the majority of women were in their fourth and fifth decades at the time of diagnosis. Ages ranged from 26 to 65 years. The mean BMI of 23.95 ± 3.38 kg/m2 is in the normal-to-overweight range and indicates a relatively lean population profile, consistent with national demographics.

Table I
Distribution of patients according to Demographics (*n* = 68).

Variables	Category	Frequency (n)	Percentage (%)
Age group (years)	26-30	10	14.7
	31-35	6	8.8
	36-40	12	17.6
	41-45	14	20.6
	46-50	12	17.6
	51-55	6	8.8
	56-60	6	8.8
	61-65	2	2.9
	Mean ± SD	43.71 ± 9.84	-
BMI (kg/m²)	Mean ± SD	23.95 ± 3.38	-

Table II summarizes contraceptive practices of the study subjects. Of the 68 patients, 52.9% had used some form of contraception, with oral contraceptive pills being the most prevalent (47.1%). Implant and injectable methods were each used by 4 patients (2.9% each). Notably, 47.1% of patients reported that they had never used any form of contraception.

Table II
Contraceptives used by the Study Populations (*n* = 68).

Contraceptive used	Category	Frequency (n)	Percentage (%)
Used	Implant	2	2.9
	Injectable	2	2.9
	Oral contraceptive	32	47.1
Not used	-	32	47.1

Table III presents the parity profile of the study population. Multiparity was predominant, with 70.6% of patients (n=48), and nulliparous and primiparous women each accounted for 14.7% (n=10) of the study population. The high proportion of multiparous women is representative of the general pattern in Bangladesh, and its high prevalence among TNBC patients in this study population is an important data point for considering the relationship between parity and TNBC in this population.

Table III
Obstetric History of the Study Populations (*n* = 68).

Parity	Frequency (n)	Percentage (%)
Nullipara	10	14.7
Primipara	10	14.7
Multipara	48	70.6

Table IV demonstrates the distribution of family history of breast cancer among the participants. The vast majority of patients (94.1% of 64, i.e., n=64) did not report any family history of breast cancer in first-degree relatives, and only 5.9% (n=4) had a positive family history of breast cancer. This low familial predisposition rate indicates that TNBC in this study population of Bangladeshis is mostly sporadic, with a negligible contribution of hereditary factors to its aetiology.

Table IV
Family History of Breast Cancer of the Study Populations (*n* = 68).

Family history of breast cancer	Frequency (n)	Percentage (%)
Yes	4	5.9
No	64	94.1

DISCUSSION

This study demonstrated the clinicodemographic profile of 68 Bangladeshi women with histopathologically confirmed triple-negative breast cancer (TNBC). The mean age at diagnosis was 43.71±9.84 years, and the maximum number of cases (20.6%) occurred in the age group (41-45 years). This finding is consistent with a study by Kumar et al., who reported that TNBC commonly presents at a relatively younger age than the hormone receptor-positive subtypes, and with data from other parts of South Asia reporting a peak incidence of TNBC in the fourth and fifth decades of life [14]. The average BMI of 23.95 plus or minus 3.38 kg/m2 in this group is normal to slightly overweight. Obesity is linked to a risk of breast cancer in women after menopause because their bodies turn androgens into estrogens. For TNBC, a type of breast cancer that doesn't depend on receptors, the connection isn't straightforward. Several surveys indicate that even moderate adiposity may adversely affect TNBC outcomes through pro-inflammatory pathways, insulin resistance, and dysregulation of adipokines [15]. The BMI profile seen our study population is consistent with the rather lean anthropometric features of the Bangladeshi female population, which requires locally calibrated cut-points for risk stratification [16]. Oral contraceptive use was reported by 47.1% of the participants, and it was the most prevalent form of contraception in this study population. This is of epidemiologic interest, considering studies have shown a modestly increased risk for TNBC linked to current or recent oral contraceptive use, especially use of high-potency progestins [17]. The hormonal environment induced in the body by the exogenous progesterone may drive the proliferation of basal-like mammary progenitor cells, which are closely related to the triple negative phenotype, thereby potentially explaining the relationship [18]. Multiparity was the most common mode of obstetrics, and was found in 70.6% of patients. This is both representative of the reproductive pattern of Bangladeshi women in general and raises questions about the complex relationship between parity and TNBC risk. Notably, high parity has long been thought to protect against hormone receptor-positive breast cancer through sustained hormonal changes associated with lactation. However, there is some evidence that multiparity may transiently increase the risk of TNBC, possibly as a result of repeated cycles of proliferation and hormonal stimulation during pregnancy [19]. These observations highlight the need for parity-specific risk stratification in breast cancer prevention programs in Bangladesh [20]. The near-absence of positive family history (5.9%) in this study population of patients is a particularly striking finding. In Western populations, there is a strong association between the TNBC phenotype and mutations in the breast cancer susceptibility gene BRCA1, and familial aggregation is not uncommon [15]. However, studies from South and Southeast Asia have reported consistently lower rates of hereditary TNBC, with most cases occurring sporadically [21]. This can reflect differences in the prevalence of the founder mutations of the two most common genetic mutations in breast cancer, reduced uptake of genetic testing, and underreporting, but suggests that non-hereditary pathways, including environmental, reproductive, and epigenetic factors, may dominate the aetiology of TNBC in Bangladeshi women [22]. The results of our study have significant implications for breast cancer awareness and the early detection strategy in Bangladesh. In view of the younger age profile and largely sporadic nature of TNBC in this population, a mass screening initiative focusing on women aged 35 years and above with accompanying educational programs related to contraceptive safety and reproductive health could facilitate an earlier diagnosis and outcome [23]. In addition, the high percentage of oral contraceptive users deserves further examination as to whether certain contraceptive formulations are preferentially linked to TNBC risk in this population [24].

LIMITATIONS

This study is limited by a small sample size (n=68) and a single-centre design, which may limit the representativeness and generalizability of the findings to the broader Bangladeshi TNBC population. Furthermore, the cross-sectional descriptive methodology prevents the determination of causal relations between clinicodemographic variables identified and TNBC risk.

CONCLUSION

Triple-negative breast cancer in Bangladeshi women occurs largely in those in the fourth and fifth decades of life, with the mean age at diagnosis being 43.71 years. Oral contraceptive use and multiparity were the most significant clinicodemographic associations found in our study population. The majority of cases were sporadic; only 5.9% of patients reported a positive family history of breast cancer, which suggests a limited role of hereditary predisposition in this population. Mean BMI was in the normal to overweight range in accordance with regional anthropometric norms. These results highlight the importance of early detection strategies targeting younger reproductive age women and the need for reproductive health counselling that includes breast cancer risk awareness. Population-level data extracted from multicenter studies are needed to develop context-related screening protocols for TNBC in Bangladesh.

RECOMMENDATIONS

Future multicenter, prospective studies with larger samples are needed to comprehensively characterise the clinicodemographic, hormonal, genetic, and pathological risk factors of TNBC in the Bangladeshi population. Molecular subtyping and mutation screening of the breast cancer susceptibility genes (BRCA) should be integrated to distinguish hereditary from sporadic patterns and to guide therapeutic strategies.

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CONFLICT OF INTEREST

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