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Clinical and Pathological Characteristics of Breast Cancer Among Emirati National Patients

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Abstract

Introduction: Breast cancer is the most frequent cancer among Emirati women and is the second leading cause of death among women in the UAE. To date, published studies regarding breast cancer in the UAE have investigated a mixed population of different ethnicities with a low percentage of UAE nationals. This is the first study to highlight the clinical and pathological data of a large cohort of exclusively Emirati national breast cancer patients diagnosed at a tertiary care medical facility.

Materials and Methods: This is a retrospective study involving breast cancer patients in UAE women who were evaluated and/or treated at the Cleveland Clinic Abu Dhabi during the period from May 2015 until June 2021.

Results: This study initially included 372 participants. The median age at diagnosis was 48 years (24–86 years) and 12.3% of patients had screening detected tumors. 30% of patients presented with locally advanced disease and 20% had stage IV disease at presentation. 24% were 40 years or younger at the time of diagnosis.

Discussion: To our knowledge, this is the largest study to date focusing exclusively on the presentation and characteristics of Emirati women with breast cancer. The median age of incidence was 48 years and the percentage of patients diagnosed with breast cancer at age 40 or younger years was 24%. This is an agreement with data published in the Middle East, but is significantly below what is reported in Caucasian women in the Western world. In this study, Emirati patients presented with advanced stages of disease. More advanced disease, and higher stage 4 at presentation is another reflection of the low screening rates, but also an indication of a higher patient thresholds for reporting breast health concerns to medical professionals for evaluation.

Conclusion: Findings of our study do suggest the need to focus efforts on continuing to understand the exact presentation of breast cancer among Emirati women and underscore the need to pursue efforts to improve public education, increase screening utilization and early detection to reduce the burden of disease and address an essential health care need for this unique population.

Keywords: Breast cancer and United Arab Emirates

Introduction

United Arab Emirates (UAE) contains a heterogeneous population, and most residents of the UAE are expatriates. Emiratis account for only approximately 10% of people living in the UAE. Breast cancer (BC) is the most frequent cancer among Emirati women^[1]. In addition, BC is the second leading cause of death among women in the UAE after cardiovascular disease^[2–4].

The reported cumulative lifetime probability of developing BC among women in the UAE increased over the past 3 decades, being 2% in 1980, 2.4% in 1990, 3.9% in 2000 and 5.2% in 2010^[5–6]. This rising incidence is not the only cause of concern, but also the advanced stage at presentation, which can be the result of multiple factors including but not limited to an earlier age at diagnosis^[2].

Previous reports provided evidence that females in the UAE have the tendency to develop BC at an earlier age than their counterparts in Western countries^[7–8].

To date, published studies regarding breast cancer in the UAE have investigated a mixed population of different ethnicities with a low percentage of UAE nationals. There are certainly differences in genetics, lifestyle and sociocultural habits among different ethnic populations in the UAE, which makes it important to study breast

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cancer presentation and characteristics in the Emirati population alone. To the best of our knowledge, this is the first study to highlight the clinical and pathological data of a large cohort of exclusively Emirati national BC patients diagnosed at a tertiary care medical facility.

Patients and Methods

This is a retrospective study involving BC patients in UAE women who were evaluated and/or treated at the Cleveland Clinic Abu Dhabi (CCAD), a tertiary care and teaching hospital located in the Emirate of Abu Dhabi, during the period from May 2015 until June 2021. Data collected at baseline (date of diagnosis) included demographic variables, clinical stage, histopathological type and grade, ancillary studies, mode of detection and type of surgical treatment. Study subjects were identified retrospectively from our electronic medical records system. Analyses were performed and reported on patients for which sufficient data was available.

Ethical approval to conduct the study was obtained from the CCAD Research Ethics Committee before the commencement of the data collection.

Results

This study initially included 391 Emirati national BC patients, 18 subjects were excluded due to lack of sufficient clinical information, and the final analysis is on the remaining 372 participants. Patients' demographics, clinical and pathological data are illustrated in **(Table 1)**. The median age at diagnosis was 48 years (24–86 years), and 27 patients (12.3%) has screening detected tumors.

Approximately, 30% of patients presented with locally advanced disease (TNM stage IIIA and IIIB), and 20% had stage IV disease at presentation. Regarding pathology, the great majority had invasive ductal carcinoma (84.6%), 12.3% had lobular carcinoma, and 2 patients (0.9%) had phyllodes tumor. Nineteen patients (10%) had grade I disease, 51% had grade II, and 39% had grade III disease; 79.8% had Estrogen receptor positive, and 67 patients (25%) had Human Epidermal Growth Factor Receptor 2 (HER2/neu) positive disease. A total of 122 patients (48.6%) underwent conserving surgery, the remainder patients underwent mastectomy. **(Table 1)**

Eighty-five patients (24%) were 40 years or younger at the time of diagnosis **(Figure 1)**. This young subgroup had a higher percentage of poorly differentiated, triple negative and Human Epidermal Growth Factor Receptor 2 (HER2/neu) positive tumors as compared to older counterparts. Patients diagnosed at 40 years or younger also had a higher percentage of stage 4 at presentation, and less screening detected tumors. **(Table 2)**

Variables	Total (n=372)	Western data
Age of diagnosis, range	24–86 years	
Age of diagnosis, median	48 years	62 years
Gender, n (%)	(n=372)	
Male	2 (0.5%)	0.7%
Female	370 (99.5%)	99.3%
Type, n (%)	(n=256)	
Invasive	229 (89%)	85%
Non-invasive	27 (11%)	15%
Morphology, n (%)	(n=229)	
Ductal	194 (84.6%)	73%
Lobular	28 (12.3%)	15%
Papillary	4 (1.8%)	0.4%
Phyllodes	2 (0.9%)	<1%
Sarcoma	1 (0.5%)	<1%
Grade, n (%)	(n=185)	
1	19 (10%)	21%
2	94 (51%)	41%
3	72 (39%)	29%
Estrogen receptors, n (%)	(n=313)	
Positive	249 (79.8%)	79%
Negative	64 (21.2%)	16%
Progesterone receptors, n (%)	(n=293)	
Positive	208 (71.2%)	NA
Negative	85 (28.8%)	NA
HERII/neu, n (%)	(n=265)	
Positive	67 (25%)	14%
Negative	198 (75%)	86%
Clinical Stage	(n=301)	
0	29 (9.7%)	21%
1	51 (17%)	42%
2	92 (30.3%)	25%
3	69 (23%)	9%
4	60 (20%)	4%
Detection modality, n (%)	(n=218)	
Screening	27 (12.3%)	25%
Symptomatic	191 (87.7%)	75%
Surgery type	(n=251)	
Lumpectomy	122 (48.6)	55%
Mastectomy	129 (51.4%)	38%

Table 1. Demographics, Clinical and Pathological Data in our series compared to data from Western series^[17]

Abbreviations: n= number, HERII/neu= Human Epidermal Growth Factor Receptor 2, NA= not available

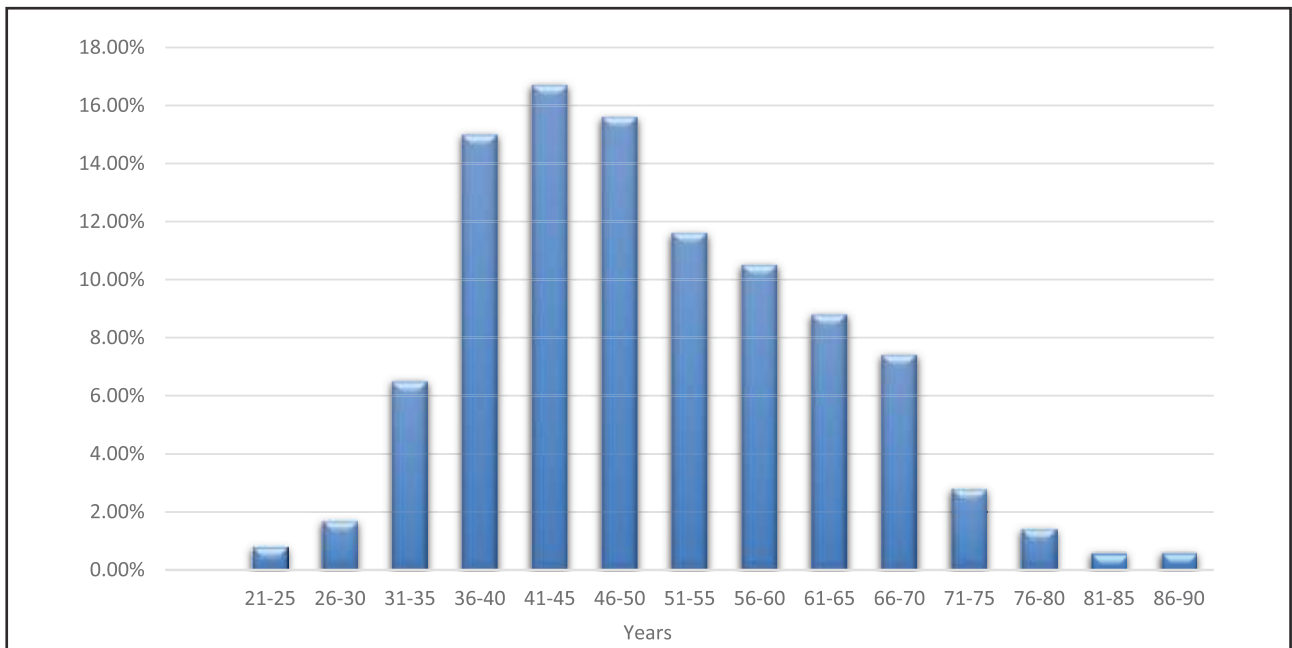


Figure 1: Study population divided by age groups

Variables	Equal or <40 years	>40 years
Number, n (%)	85 (24%)	268 (76%)
Grade, n (%)	(n=44)	(n=139)
High Grade	26 (59%)	54 (38.8%)
Receptors, n (%)	(n=62)	(n=195)
Triple negative	9 (14.5%)	21 (10.7%)
HERII/neu, n (%)	(n=62)	(n=202)
Positive	17 (27.4%)	49 (24.2%)
Clinical Stage	(n=69)	(n=227)
4	16 (23.1%)	43 (18.9%)
Detection modality, n (%)	(n=47)	(n=170)
Screening	3 (6.3%)	23 (13.5%)
Symptomatic	44 (93.7%)	147 (86.5%)

Table 2: Comparing tumor characteristics, clinical stage and mode of detection between patients above and below 40 years at diagnosis

Abbreviations: n= number, HERII/neu= Human Epidermal Growth Factor Receptor 2

Discussion

To our knowledge, this is the largest study to date focusing exclusively on the presentation and characteristics of Emirati women with breast cancer. Previous studies reporting on BC in the UAE have included expats and local nationals in variable proportions (**Table 3**) which does not reflect on the characteristics of BC in the local Emirati population.

The median age of BC incidence in our cohort was 48 years, and the percent of patients diagnosed with BC at age 40 or younger years was 24%. This is an agreement with data published in the Middle East on the incidence of breast cancer in Arabic women, but is significantly below what is reported in Caucasian women in the Western world^[7-8]. The median age of women with BC at presentation in the United States is 62 years for white Caucasian women^[9] and slightly lower for African Americans and Hispanic or Asian women (55 years for Hispanic, and 56 years for African Americans and Asians)^[10]. This phenomenon is also seen in other developing nations (Latin America, Asia) where the incidence of breast cancer is also lower than in Western countries^[11]. It is unclear, why there is a variation in the age at diagnosis of BC among different ethnic groups, and why in particular, the age at diagnosis in our population and the Middle East region in general is more than 10 years younger than for Western women. Efforts to understand contributing factors which could include environmental or genetic factors are clearly warranted. This finding has significant implications regarding screening recommendations for the local population, which may need to be initiated at an earlier age to capture a larger proportion of women at risk of developing BC. As mammography has limited value in younger patients with dense breast tissue, consideration for screening breast ultrasound could be made. Certainly, efforts to risk stratify patients based on family history, genetic and other factors could have an important role in identifying patients who may benefit from early screening and prevention strategies.

Author	Year	Total patients	Percentage of Emiratis (%)	Median age of Incidence (years)	Most common stage at presentation
Elobaid et al [2]	2016	1611	21.4%	48	II
UAE Cancer registry [20]	2017	834	26%	48	II
Altinoz et al [21]	2020	309	42.3%	NA	NA
Elobaid et al [6]	2021	988	19%	NA	II

Table 3: List of BC publications from UAE

Abbreviations: NA= not available, BC=breast cancer, UAE= United Arab Emirates

BC screening remains a powerful way of improving BC early detection and survival rate^[12]. The current study revealed that only 12.3% of the patients had screen-detected breast cancer and the remaining patients presented only when they had tumor related symptoms. Rates of screen-detected breast cancer are nearly double this in reported series from the United Kingdom^[13]. An earlier report from more than 10 years ago in the UAE also showed that participation of women in breast cancer screening activities is very low (10%)^[14]. Similar reports from neighboring Gulf countries like Saudi Arabia and Qatar also showed low participation rates in BC screening campaigns, which were attributed to insufficient public education, health awareness, and traditional sociocultural factors^[15–16]. These findings in our local population and other countries in the Gulf region, underscore the need for additional efforts in public education, and in implementing age-adjusted and wide scale screening strategies and campaigns.

In this study, Emirati patients presented with advanced stages of disease. Forty three percent of the patients presented with stage 3 or 4 disease, and 20 % presented with stage 4 disease. This is in line with what was reported by the UAE cancer registry data which showed that 15% of BC patients among UAE residents (nationals and expats) had metastatic disease at presentation^[3–4]. Reports from US population during the same time frame of our study showed that 64% of breast cancer patients presented with early-stages (Stage I–II) compared to 47% in the current study; 13% presented with stage 3 or 4 (vs 43% in this study) and only 4% had stage 4 at presentation (vs 20% in our study)^[17]. More advanced disease, and higher stage 4 at presentation is another reflection of the low screening rates, but also an indication of a higher patient thresholds for reporting breast health concerns to medical professionals for evaluation. This also requires significant efforts and campaigns for public education and improvement in health awareness for earlier awareness regarding changes in breast health.

Although this is the largest study from the UAE on pure Emirati women with breast cancer, there are several

limitations related to its retrospective nature, and for being from a single Institution which could introduce a referral bias and inaccurate representation of breast cancer among all Emirati patients.

Conclusion

However, the findings of our study do suggest the need to focus efforts on continuing to understand the exact presentation of breast cancer among Emirati women and underscore the need to pursue efforts to improve public education, increase screening utilization, and early detection to reduce the burden of disease and address an essential health care need for this unique population.

Funding and Conflict of Interest

This study required no funding and the authors declare no conflict of interest.

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