Characteristics of incident female breast cancer in Lebanon, 1990–2013: Descriptive study of 612 cases from a hospital tumor registry

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ABSTRACT

Despite the fact that breast cancer is a major health issue, very few studies describe its characteristics in the Arab world or the Middle East, particularly in Lebanon. We report in this article a retrospective pilot study of the characteristics of breast cancer in Lebanon. The pathological characteristics of 624 patients diagnosed between 1990 and 2013 randomly chosen from the archives of an oncology clinic affiliated to Hotel Dieu de France Hospital are analyzed. The mean age at diagnosis is 54.6 ± 13.4 years with 43% diagnosed before the age of 50 years. The infiltrative ductal carcinoma represents the major pathological subtype. One third of the tumors had a size of more than 2 cm at diagnosis. Estrogen-receptors are positive in more than 50% of our patients and Her2-neu is overexpressed in 30%. Luminal A represents 45.5% and the triple negative subgroup constitutes only 8.3%. Breast cancer in Lebanon is evolving to a more indolent disease. Therefore, public awareness and institution of screening programs are required. These programs should be based on national epidemiological data and necessitate the activation of the national cancer registry.

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1. Introduction

Breast cancer (BC) constitutes a major health problem as it is the most frequent of female cancers worldwide [1]. Effectively, it is the most prevalent cancer in the Middle East but its incidence varies between countries [2]. These numbers are also expected to rise because of the increased lifespan of this population and its adoption to a Westernized life style [3]. In the absence of active national cancer registries, very few studies of the characteristics of this tumor in the Arab world, particularly in the Middle East, were published. Therefore, we conducted a study of the characteristics of this tumor as experienced in a clinic affiliated to Hotel Dieu de France hospital in Lebanon and compared it to that of other countries. Lebanon is a small population of around four millions inhabitants located on the Eastern side of the Mediterranean shores.

Its residents are characterized by rapid population growth, high rates of consanguinity and large family sizes [4].

2. Patients and methods

2.1. Study design and setting

Breast cancer cases were selected from the tumor archives of an oncology clinic affiliated to Hotel Dieu de France Hospital, Beirut, Lebanon, a tertiary care center serving an urban population. Since 1985, incident cases of cancer have been recorded and pathology reports are available. A national breast cancer screening program for women has been in place since 2007: starting age 40, and for as long as a woman is in good health, an annual mammography is recommended [5]. Hospital records are known to be incomplete before 1990 as hormonal and HER2 receptors were not performed previously.

2.2. Participants

Cases eligible for this study were all people with histologically confirmed incident breast cancer [ICD-10 C50] diagnosed between
1990 and 2013. We excluded from the study patients with missing data, foreign patients, those diagnosed before 1990, and those metastatic at presentation. Six hundred twenty four cases were selected at random from a registry of 4000 patients, using a random number table. As the national screening program was initiated in 2007, statistical analysis of the screening effect predetermined a subdivision of the study period into four equal subgroups of six years (1990–1995, 1996–2000, 2001–2006 and 2007–2013) to allow analysis of the screening effect.

2.3. Data source and variables

Information on age and gender were obtained from the clinic registration records. Data on tumor histology, tumor size, lymph nodes status, grade, hormonal and HER2 receptors status were obtained from pathology reports. All tumors were re-staged to 2010 TNM recommendations using clinical information from the pathology reports [6]; two clinicians independently scored each case and disagreements were resolved by discussion.

2.4. Statistical methods

Minitab software was used for statistical analysis. Our clinical data is expressed in mean ± standard deviation (SD), or median, or percentage. The relationships between each of the variables are assessed by Pearson’s correlation. A p value <0.05 is considered significant.

3. Results

Of the 624 patients randomly chosen from the study period of interest, 12 were male BC and would not be considered in the statistical analysis. Table 1 summarizes the major characteristics of female patients with BC in Lebanon.

3.1. Age at diagnosis

The mean age at diagnosis is 54.6 ± 13.4 years (range 24 and 89 years) of which the majority belongs to the 51–60 years subgroup. By subdividing the patients according to the year of diagnosis subgroups, the mean age at diagnosis tends to decrease slightly from 56.5 to 54.3 years between 1990 and 2013, but there is little consistent variation over time in the distribution by age group.

3.2. Tumor type and stage

Invasive ductal and lobular carcinomas are the most prevalent histological subtypes at 67.0% and 12.9% respectively overall. There was little variation by time period in the percentage classed as invasive ductal carcinoma; between the earliest and the latest time periods studied, the percentage of ILC increased and of other and unspecified tumors decreased. At diagnosis, T2 (41.7–48.3%) and N0 (34.0–47.0%) are most commonly encountered with an increased N0 status frequency as of 2002. The in situ stage percentage increases from 0.9% in 1990–1995 to 2.6% in 2008–2013.

3.3. Hormone receptors subtypes

Overall, estrogen and progesterone receptors are present in 68.6 and 64.7% of tested patients, with an absence of correlation between their combined presence (p = 0.15). The HER2 receptor is positive in 39.5% and negative in 60.5% of those tested. The proliferation index study was not conducted in 78.0% of our patients. Its expression is mild in 50.4%, moderate in 28.9% and strongly positive in 20.7% of those with the conducted test. Tested patients belong to luminal A in 35.4%, followed by the triple negative subgroup and luminal B at 11.6 and 8.4% respectively. Throughout the study period, the prevalence of luminal A increases from 18.9 to 35.4% with a decrease in the triple negative subgroup from 17.6 to 11.6%.

4. Discussion

Data of the characteristics of BC in the Middle East are sparse and even inexistent. We report in this paper the first study of the characteristics of BC in this region after analyzing the data at our institution.

4.1. Age at presentation

The mean age at diagnosis is 54.6 years with 42.9% of our patients diagnosed before the age of 50 years. Similarly to the Lebanese report published in 2003, the highest prevalence of patients diagnosed with breast cancer belongs to the 51–60 years of age subgroup with a decrease thereafter [7]. In comparison, reported age distributions of other Arab and Western countries have shown that as many as two thirds of Arab women are diagnosed before the age of 50 years, with a mean age at diagnosis of 48 years; whilst 25–33% of European and American women are diagnosed before the age of 50 years with a mean age at diagnosis of 63 years [8,9]. It is suggested that the generally higher proportion of younger patients in Arab populations may be due to the evolving trends in reproductive patterns, and to the fact that these populations are younger overall [13]. The implementation and uptake of screening programs may also affect age at diagnosis, although in our study there was no clear change in the age distribution at diagnosis before and after implementation of screening in 2007, despite the Lebanese screening program recommendations to start screening at age 40 [5].

4.2. Tumor type and stage

In concordance with the Arab reports, our data shows that invasive ductal carcinoma is the most prevalent pathology type followed by invasive lobular carcinoma and ductal carcinoma in situ [10–14].

Advanced stages at diagnosis are typical as the wide majority of Arab women consult their physicians late during the disease course [15]. In our experience, only one third of our patients are diagnosed with a tumor size of less than 2 cm whilst the majority has advanced disease. This is the case of most Arab countries [16–18]. In Morocco, 70% of women presents with tumors of more than 2 cm, 72% are diagnosed at stage II and III whilst only 7% are diagnosed at the first stage [10]. Similarly in Tunisia, advanced stages at diagnosis are found in 81% whilst 11% are diagnosed at first stage [11]. Lymph node involvement is noted in up to 54% of our patients, 79% in Yemen, 73% in Iraq, 79% in Saudi Arabia, 50% in Bahrain and 65% in Palestine Arabs [12,16–20].

4.3. Hormone receptors subtypes

The molecular subtypes of BC may be affected by race, age, stage and grade [21–23]. In general, estrogen-receptor positive status is around 60% and 70% in Asian and Western women respectively whilst overall Arab women are negative for estrogen-receptor and overexpress HER2 [15,24]. Our patients are estrogen-receptors positive in 68.6 of the cases and HER2 is overexpressed in 39.5%. The combination of this data into prognostic groups shows an increased frequency of luminal A over time in contrast to a decreased prevalence of the triple negative group. The distribution of reported prognostic subtypes varies between Arab populations.
In Saudi Arabia, luminal A constitutes only 4% [17]. In Tunisia, 51% of their patients belong to the luminal A and 23% to the triple negative group, HER2 is overexpressed in 13% of their tumors [25]. Morocco presents luminal B as the most prevalent group (42%) followed by luminal A at 31%, HER2 was positive in 5% [26].

5. Conclusion

Albeit the installation of a Lebanese national cancer registry in 2002, it has been inactive and therefore gathering more statistically significant data is impossible. Its activation despite repetitive failures would allow to study the particularities of BC in this region and provide basis for etiological research and improvement in healthcare strategies. An acceptable alternative would be hospital-based tumor registries despite their inconsistent data and referral bias.

Conflict of interest statement

None.
Authorship contribution

Georges Chahine: outline and drafting of the design of the article

Elie El Rassy: review of literature, drafting, and critical writing

Aline Khazzaka: statistical analysis and results interpretation

Khalil Saleh: collection of data and critical writing

Nathalie Rassy: statistical analysis and results interpretation

Nadine Khalife: collection of data and critical writing

David Atallah: concept, design, corrections, and final approval.

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