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Age at diagnosis of breast cancer in Arab nations

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ABSTRACT

The impression among Arab Physicians dealing with breast cancer is that it presents at an earlier age and at a more advanced stage as compared to western countries. However, the statistical data to support this impression is remarkably scarce.

Method: We performed a comprehensive literature review of reports of breast cancer in Arab countries. Articles were identified from Saudi Arabia, Bahrain, Qatar, Kuwait, Emirate, Oman, Yemen, Iraq, Syria, Jordan, Lebanon, Egypt, Libya, Algeria, Tunis, Morocco, and Sudan.

Results: Twenty eight articles were identified and reviewed. The average age at diagnosis of breast cancer was available in 18 articles; the average age was 48 (SD = 2.8), range 43–52, median 48.5 and mode 45 years among the 7455 patients included. The median age of diagnosis of breast cancer was available in 8 articles; here, the average age was 45.4 (SD = 4.8), range 40–54.5, median 44.5 years among the 5379 patients included. The percentage of patients that were younger than 50 years old was reported in 11 articles from 8 countries and included 5144 patients; 65.5% (SD = 11) were less than 50 years old (range 49–78%, median = 66%).

Discussion: In this literature review, the average age at presentation of breast cancer in Arab countries appears to be a decade earlier than in western countries. If this is true, this has important implications for screening and cancer management strategies in these countries, including the ideal age at which to begin screening. Adoption of Western guidelines "without critical amendment" in planning breast cancer programs will waste resources without achieving desired outcomes. Determination of the true frequency and age of onset of breast cancer in Arab women should be an important research priority.

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1. Introduction

The Arab world has a population of approximately 301,227,000 (2004), living in 22 countries spread across Northern Africa and Western Asia, including the Middle East.[1] Originating in the Arab peninsula, population migration has continued throughout history. Arabs share common demographic features that include high rates of consanguinity, large family size and rapid population growth. There is a high frequency of autosomal recessive disorders and an increased frequency of homozygocity for autosomal dominant traits which have made certain disorders more prevalent in Arabs, for example, renal osteoporosis and renal tubular acidosis, Meckel's syndrome, and autosomal recessive severe childhood muscular dystrophy.[2] Breast cancer is the most common cancer among women in Arab countries.[1] Even so, the exact volume and burden of the disease is not known.

The impression among Arab physicians dealing with breast cancer is that it presents at an earlier age and at a more advanced stage than in western countries. However, the statistical data to support this impression is remarkably scarce. Most cancer registries in Arab countries are not publically available, data may not be gathered consistently, and data is not available or used to answer research questions.

Breast cancer that presents at a younger age generally has more aggressive cellular features resulting in more aggressive clinical behaviour, more advanced stage at presentation, and poorer prognosis.[3] Treatment strategies are therefore also more aggressive, and often include chemotherapy and radiation in addition to surgery. Age at diagnosis therefore has important implications when planning breast cancer treatment units in terms of personnel, drugs, equipment and financial resources.

In addition, before the availability of breast imaging, the control of breast cancer relied entirely on the successful treatment of palpable disease. Today breast cancer control is significantly improved by the ability to diagnose the disease at a more favourable stage, such as when cells have not crossed the basement membrane (in situ), or when the invasive disease is too small to be

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palpable. Population-based breast screening programs using mammography have reduced breast cancer mortality in western countries;[4] the implementation of screening programs in Arab nations is inevitable. Age at diagnosis will critically impact the choice of screening strategy. If breast screening programs are to be implemented in Arab countries, at what age should mammographic screening be started, and is mammography the best imaging modality?

By reviewing the available literature produced by researchers in Arab countries, we aim to use evidence-based information to test the hypothesis that the presentation of breast cancer occurs at a younger age group in Arab women.

2. Materials and methods

All available abstracts and articles about breast cancer that discussed age at diagnosis of breast cancer in Arabs, either as its primary subject or considered within the context of that article, have been reviewed. An information specialist through Medline and Embase performed a systematic search. In addition, a personal search was done for each Arab country. Search terms used included "Age at diagnosis of breast neoplasm, Breast tumour, breast cancer, intraductal, nonifiltrating, lobular"; these were combined with "Arabs, middle east and each country included". Specific countries included are Saudi Arabia, Bahrain, Qatar, Kuwait, Emirate, Oman, Yemen, Iraq, Syria, Jordan, Lebanon, Egypt, Libya, Algeria, Tunis, Morocco, and Sudan. The data searched for were average, median and percentage of the population under study that is younger than 50 years old at the time of diagnosing breast cancer. Patients in the articles that were discussed under specific groups like male breast cancer, breast cancer in pregnancy, familial breast cancer, pre or postmenopausal breast cancer, breast cancer related to BRCA genes were not included in this search. Data were collected on Access form – Microsoft 2007 and analysed. Some Countries were also excluded because published articles mentioning age at diagnosis of breast cancer could not be traced (Syria, Morocco and Iraq).

3. Results

On Medline search (1950–2008, 1st week of November), 77 abstracts were produced using the search strategy. Only 4 met the criteria for inclusion. On Embase search (1980–2008 week 47) 35 abstracts were produced with 7 meeting the inclusion criteria. Two were excluded, however, because data regarding age was not mentioned in 1, while the other article could not be traced. The other 19 articles were produced after specific search per country in Medline and Yahoo. An additional 2 articles were excluded because the study used the age of 45 years as the cut-off rather than 50 years of age. After all exclusions, there were 28 article included. Table 1 summarizes the results.

3.1. Average age at diagnosis of breast cancer

The average age at diagnosis of breast cancer was available in 18 articles from 11 countries (Egypt (1), Emirate (2), Jordan (3), Kuwait (1), Lebanon (1), Oman (1), Qatar (1), Saudi Arabia (1), Sudan (1), Tunis (5) and Yemen (1)) (Table 1). From these articles, the average age was 48 (SD = 2.8), weighted average was 49.8, range 43–52, median 48.5 and mode 45 years. The total number of patients included in these studies was 7455 (Table 2).

3.2. Median age at diagnosis of breast cancer

The median age of diagnosis of breast cancer was available in 8 articles produced in 4 countries (Bahrain (1), Egypt (1), Saudi Arabia (5) and Tunis (1)). From these articles, the average age was 45.4 (SD 4.8), weighted average 49.4, range 40–54.5, median 44.5 years. The total number of patients included was 5379 (Table 2).

For all averages and medians (pooled average and median), the weighted average was 49.6 for total number of patients of 12,839 (Table 3).

Table 1
Age at diagnosis of breast cancer in Arab countries.

Country	Author	Year published	Study design	Period patients	Average	Median	<50 (%)
Algeria	Nancy[5]	2008	Case series	NA			66
Bahrain	Al Saad[6]	2006	Case series	1999–2005	35	50	67
Egypt	Bedwani[7]	2001	Case series	1990–2000	2860	54.5	
	Hussein[8]	2004	Cross sectional	NA	53	43	
Emirate	Denic[9]	2005	Case control	NA	72	49	
	Thanaa[10]	1997	Case series	NA	228	48	
Jordan	Abu Salem[11]	2002	Case series	1998–2001	44	46	
	Amr[12]	1985	Case series	NA	45		
	Dajani[13]	1987	Case series	1980–1985	228	45	
Kuwait	Paszko[14]	1993	Case series	NA	315	52	78
Lebanon	El saghir[15]	2002	Case series	1983–2000	2673	50	49
Libya	Akhtar[16]	1993	Case series	1981–1985	335		72.3
Oman	Al-Moundhri[17]	2004	Case series	1996–2002	152	48	
Qatar	Rasul[18]	2003	Case series	1991–2001	70	48	
Saudi Arabia	Al Idrissi[19]	1992	Case series	1981–1990	130	40	66
	Elkum[20]	2007	Case control	1986–2002	867	45	
	Ezzat[21]	1999	Case series	1981–1991	315	46	64
	Ibrahim[22,23]	1998	Case series	1985–1995	292	42	78
		2005	Case series	1992–2001	780	42	78
	Mansoor[24]	2001	Case series	NA	300	49	
Sudan	KD AwadelKarim[25]	2007	2 Case Series	2004–2005	114	52	51
Tunis	Ayadi L[26]	2008	Case series	2000–2004	155	52	51.6
	Ben Ahmed[27]	2002	Case series	1990–1998	729	50	
	Labidi[28]	2000	Case series	1994–2000	100	44	
	Maalej M[29,30]	1999	Case series	1994	689	50	
		2008	Case series	2004	1437	51	
	Sahraoui[31]	2006	Case series	1993–2002	41	45	
Yemen	Althobhani[32]	2006	Case series	NA	155	45	

Table 2
Summery of all results.

Breast cancer	Countries included	Average (SD)	Range	Median	Mode	Total patients number	Total number of studies
For all averages of age at diagnosis	Egypt, Emirate, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, Tunis, Yemen	48 (2.8)	43–52	48.5	45	7455	18
For all medians of Age at diagnosis	Bahrain, Egypt, Saudi Arabia, Tunis	45.4 (4.8)	40–54.5	44.5	42	5379	8
For all proportions in the study population that is younger than 50 years old	Algeria, Bahrain, Kuwait, Lebanon, Libya, Saudi Arabia, Sudan, Tunis	65.5% (11)	49–78%	66%	78%	5144	11

3.3. Proportion in the study population that was younger than 50 years old

The percentage of patients younger than 50 years old in each study population was not the primary intention of this search. It was, however, stated in 11 articles produced from 8 countries (Algeria (1), Bahrain (1), Kuwait (1), Lebanon (1), Libya (1), Saudi Arabia (4), Sudan (1) and Tunis (1)). Across these articles, 65.5% (SD = 11) on average were less than 50 years of age (range 49–78%, median of 66%). The total number of patients was 5144 (Table 2).

4. Discussion

In this literature review, the average age at presentation of breast cancer in Arab women is shown to be a decade earlier than western countries. Across 18 articles, the average and median averages were 48 and 48.5 years old, respectively. Moreover, 65.6% of the patients were younger than 50 years old in 11 studies (Table 2). The explanation could be related to the fact that Arab nations have younger population compared to western countries; the median age is almost one decade younger according to WHO statistics[33] (Table 4). However, these findings do support the hypothesis that breast cancer may present at an earlier age in Arab women.

The age standardized incidence rate for breast cancer in Arab women is approximately one fourth to one third that of Western women[34] (Table 4). This significant difference may be related to different risk factors. However, there are 2 interesting studies which possibly raise an alarm regarding the prevalence of breast cancer. The first is from Egypt, where 4116 women aged 35–64 were screened in a defined geographical area. Eight breast cancer cases per 1000 women were detected initially and 2 more cases were added on rescreening.[35] The second study is from Tunisia, where free screening mammography was offered to 2200 women aged 40–70. Twenty-four percent had a positive test, and 4.5 cancers were detected per 1000 women.[36] These studies suggest that breast cancer may be more common than expected. More research is needed to demonstrate the actual prevalence of breast cancer in Arab nations.

This data suggests that there may be clear social, economic and population differences in the age of presentation of breast cancer between Arab and Western populations. We did not compare the stage of presentation of breast cancer in Arab women as compared to Western populations as this information difficult to obtain, but such research is a necessary next step. The effect of such differences could result in significant alterations in disease presentation and behaviour. As a result, adoption of Western guidelines "without critical amendment" in planning for managing breast cancer would not yield the same results, and resources utilised might be wasted without achieving desired outcomes.

Screening would have no benefit if not followed by treatment (including surgery), and treatment is likely to be more effective if cancer is detected at earlier stage by screening. The combination of screening and treatment has an overall estimated reduction in death from breast cancer of 24.9–38.3%. The contribution of breast screening to this reduction is 28–65% (median, 46%).[37] The importance of mammographic breast screening is obvious; currently it is probably the single most important strategy to decrease mortality from breast cancer. Meta-analyses of randomized controlled trials demonstrate a 7–23% reduction in breast cancer mortality rates with screening mammography in women 40–49 years of age.[38] At present nationwide breast screening programs in Arab countries do not exist. However, with the increased awareness regarding breast cancer and the prosperity that many Arab countries are experiencing, the implementation of such programs is inevitable.

The recommendation in Western practice is to start screening at the age of 50 years [National Health Service (NHS),[39] European

Table 3
Weightedstatistics for age at presentation.

Statistic	Number of studies	Total sample size	Weighted average[a]
Average	17	7455	49.8
Median	8	5379	49.4
Pooled Average/Median	25	12839	49.6

[a] An average where each individual is assigned a weight proportional to its sample size. A weight for a study is calculated as the study sample size divided by the total sample size (over all the studies with a non-missing average).

Table 4
Total population and median age of the population (WHO 2006) and age standardized incidence rate of breast cancer comparing Arab countries with selected Western nations (International Agency for Research on Cancer 2002). The incidence of breast cancer is significantly lower in Arab nations, and their average population is younger than in Western nations.

Country	Total population $\times 10^3$ (2006)[33]	Median age (2006)[33]	Age standardized incidence rate of breast cancer per 100,000[a] (2002)[34]
Algeria	33,351	24	32.5
Egypt	74,166	23	24.2
Jordan	5729	21	33
Kuwait	2779	29	31.8
Lebanon	4055	27	52.5
Libya	3408	25	23.4
Morocco	30,853	25	22.5
Oman	2546	23	13.2
Qatar	821	31	33.3
Saudi Arabia	24,175	24	24.7
Tunisia	10,215	27	19.6
Emirates	4248	30	24.1
Yemen	21,732	17	35.1
Canada	32,577?	39	84.3
France	861,330	39	91.9
Germany	86,641	42	79.8
Italy	58,779	42	74.4
UK	60,512	39	87.2
USA	302,841	36	101.2

[a] Age-standardized incidence rate is the number of new cases of cancer or cancer deaths per 100,000 that would have occurred in the standard population if the actual age-specific rates observed in a given population had prevailed in the standard population.

Union Council,[40] and International Agency for Research on Cancer (IARC)[41,42]. As a concept, breast screening should start 5–10 years earlier than the age group in which breast cancer is commonly diagnosed.[43] If the average population in Arab nations is one decade younger than Western nations, and the presentation of breast cancer is truly in the 40–50 year age group, it would seem unreasonable to commence screening at age 50 years of age. A significant proportion of women having sub clinical breast cancer would not be included. Starting breast screening in Arab women at age of 40 years old needs to be explored. This will be similar to many major US medical organizations that in reality recommend screening mammography for women aged 40 years and older.[44–46] The optimal screening modality would also need to be explored. Certainly, screening mammography is less sensitive in younger women, mainly due to increased breast density that can obscure the radiological features of early breast cancer. However, magnetic resonance imaging (MRI) has proved to clarify ambiguous lesion on mammograms. In fact, strategies that combined MRI plus mammography with or without ultrasound and clinical breast examination reported sensitivities of 93–100%[47] and could potentially be investigated in a randomised fashion as a screening modality in young Arab women.

Unfortunately, breast cancer that present in young women generally have poorer clinicopathologic variables [larger size, lymph node positive, poorly differentiated, higher ER and PR receptors negativity and higher human epidermal growth factor receptor 2 (HER-2)] which suggest aggressive behaviour.[48–50] This clearly has implications on treatment options. For example, breast conserving surgery is generally appreciated by young patients, along with a satisfactory negative surgical margin and the subsequent application of high quality radiotherapy. Aggressive chemotherapy with all its side effects and complications is often necessary. Hormonal therapy should not be used in oestrogen and progesterone receptors negative patients. Treatments need to follow standard protocols to avoid inappropriate management and non-compliance. Reconstructive breast service should be offered. A comprehensive plan that includes training in the different disciplines required, establishment of specialised breast units, provision of equipments, and adequate financial support is required to care for these patients properly.

In addition, young women might have critical personal concerns such as work, family commitments that include raising children, and other life matters that should be considered in programs created for breast care. Breast care programmes can include but not limited to children care services, home care, transport services, financial support, protecting work policies and community support centers that include volunteers and support groups.

Finally, planning without data that continuously produces useful and reliable information specific to each population can lead to structures and processes that produce unsatisfying outcomes. Researchers in the field have noticed the scarcity of data and researches related to breast cancer in Arabic countries. The creation of a breast cancer data bank would be an important first step in the improvement of breast cancer care in Arabic countries. Other strategies could include more investment in structuring national registries, systematic registration of patients and funding and training local researchers. If data are properly and reliably collected, summarized and analyzed by professional researchers, the information obtained will aid tremendously and accurately in planning according to the needs of the population living in Arab countries.

4.1. Conflict of interest statement

Authors declare that, there is no conflict of interest with any other persons or organizations.

4.2. Funding

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4.3. Ethical approval

None declared.

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