Original Article

Epidemiology of breast cancer in the North Jordan

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ABSTRACT

Objective

To determine the annual rate of breast cancer in North of Jordan and describe their main epidemiological characteristics through the year 2007.

Subjects and Methods

In the period between January 2007 and December 2007, 36 new female cases had histo-pathologically proven primary breast cancer at Prince Rashed Bin Al-Hassan Military Hospital, Jordan. Breast cancer recurrence or metastasis were excluded. The age-adjusted standardized rates, and standardized rate ratio were calculated by a directly age-standardized method and the World Health Organization "standard population" expressed per 100,000 inhabitants. The 2006 civilian female population of the North Jordan was estimated to be 750,000 and approximately one-third (250,000) hold a military health insurance, based on the 2006 census.

Results

The crude rate of breast cancer in the North Jordan was 14.37/100,000 females per year. The age-adjusted rate was 24.29/100,000 females. 35-39 years age group showed a relatively high age-specific rate, and then the rate slightly attenuated until 45-49 years of age group, when they gradually increased, to reach the peak rate at 60-64 years of age group, then slightly declined. Cancer of the right breast was noted more than left breast. Right-to-left standardized rate ratio was 2.18. Upper lateral quadrant was the most frequent location of cancer. The age-adjusted rate was 16.48/100,000 per year. Infiltrating duct carcinoma was the commonest histological type (86.11%), followed by lobular carcinoma (8.33%), and mixed (duct and lobular) carcinoma (5.56%).

Conclusion

The overall age-adjusted incidence of breast cancer in the North Jordan was 24.29 per 100,000 females. The upper lateral quadrant was the commonest site and infiltrating duct carcinoma was the most common histological type. As the rate increased with increasing age, and the women of more than 40 years are likely to benefit the most from breast screening. (Rawal Med J 2010;35:).

Keywords

Breast cancer, epidemiology, Jordan, infiltrating ductal cell carcinoma.

INTRODUCTION

According to data from the Jordan National Cancer Registry, breast cancer is the most common malignant neoplasm affecting Jordanian females.[1] It is also the most common cancer in females all over the world and the second leading cause of death among women, especially beyond the age of 45 year.[2-4] In American females, it is accounts for 32% of all cancers.[5] Arab countries have reported an early age of onset and a preponderance of aggressive breast cancer phenotype,[6] on other hand females with breast cancer in Jordan are significantly younger than those in the West, with an average age ranging from 45-47 years.[3] Major risk factors for cancer of the breast include advanced age and positive family history of breast cancer in first and second-degree relatives that may be attributed to genetic influences such as breast cancer 1, early onset (BRCA1) together with patented by Myriad breast cancer 2 gene mutations (BRCA2).[7] Other associated factors may be low parity, early menarche, late menopause and the negative history of breast-feeding.[10-13]

The site of a tumor on an organ has been known to affect treatment options and survival rate in some cancers.[14] There is some evidence to suggest that the quadrant of involvement in breast cancer can affect disease recurrence,[15] distant relapse and survival.[16-17] However, recent studies failed to find any influence of intra-mammary tumor location on the disease outcome.[18-19] A primary concern of breast cancer researches today is to understand what motivates women to comply with breast cancer screening recommendations. Traditionally healthcare providers have thought that health teaching increases compliance as the survival rates are highly dependent on early detection. Breast cancer screening methods such as mammography, physical examination, and breast self-examination may increase the likelihood of early detection and survival rates.[20-21] The purpose of this study was to ascertain the rate of breast cancer in North Jordan females and describe their epidemiological characteristics through the year 2007.

Methods

All cases included in this study are from the records of the section of histopathology at Prince Rashed Bin Al-Hassan Military Hospital (PRH), which serve residents of the North Jordan holding a military health insurance in the four governorates (Irbid, Mafraq, Jarash and Ajloun).

The case definition for this study is any primary breast cancer diagnosed, for the first time in female population, at PRH during the period from January 2007 to December 2007. Those included in this study were all females with a histologically proven primary breast cancer. Tumors diagnosed as reappearance of a previously treated tumor (recurrent or metastasis) were excluded.

Table 1. WHO World Standard Population used for Age Adjustment.

Age (years)	WHO World Standard*(100)	WHO World Standard* (100 000)
0-4	8.86	8860
5-9	8.69	8690
10-14	8.60	8600
15-19	8.47	8470
20-24	8.22	8220
25-29	7.93	7930
30-34	7.61	7610
35-39	7.15	7150
40-44	6.59	6590
45-49	6.04	6040
50-54	5.37	5360
55-59	4.55	4550
60-64	3.72	3720
65-69	2.96	2950
70-74	2.21	2210
75-79	1.52	1520
80-84	0.91	910
85+	0.63	620
Total	100	100 000

*For purpose of comparison, the WHO standard age group 85+ is aggregate of the age groups 85-89, 90-94, 95-99 and 100+. Ahmad OB.[27]

The method used is a description of variables including age, site and histological types. Age-specific rates (ASR) of breast cancers were calculated using standard 5-year age division. The assessment age groups for which the number of cases and the corresponding female-years of risk, the number of groups was 11 and the categories used were <35, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74 and 75 and over (75+) years age groups.

The data presented in this study were coded using the International Classification of Disease for Oncology (ICD-O) coding system, breast cancer cases were defined with ICD-O- codes of C8500-C8522. The rate refers to number of newly diagnosed cases of breast cancer. The crude rate was calculated as the number of new breast cancer cases diagnosed in the year 2007, divided by the number of female population of North Jordan. The age-adjusted rates were calculated by a directly age-standardized method that would have occurred if the observed age-specific rates applied in a reference population: this population commonly referred to as the World Health Organization (WHO) "world standard population" expressed per 100,000 inhabitants, allowing comparison of rates among the North Jordan female population. The WHO world standard population valid for 2000-2025 has been calculated (Table 1).[22]

The ratio of directly age-standardized rates from different morphological, anatomical sites of the breast included right versus left breast and the four anatomical locations (upper lateral quadrant (ULQ), upper medial quadrant (UMQ), lower medial quadrant (LMQ) and lower lateral quadrant (LLQ)). It is called, standardized rate ratio (SRR), and represent the relative risk. The 2006 civilian local female population of the North Jordan was estimated to be 750,000.[1] One-third (250,000) hold a military heath insurance, those considered as a target population of such as a representative sample of North Jordan female population for this study and they were the actual population treated in PRH, based on the 2006 census.[23,24]

RESULTS

During the study period, 36 females had histo-pathologically proven breast cancer. The crude rate was 14.37/100,000 females per year.

Table 2. Age-specific, crude and age-adjusted rates.

Age (years)	**No.**	**%**	**ASR**
< 30	3	7.27	13.69
30-34	1	7.27	5.15
35-39	6	12.73	38.05
40-44	5	3.64	42.02
45-49	3	10.91	35.54
50-54	4	10.91	62.03
55-59	4	14.55	68.06
60-64	5	14.55	105.66
65-69	2	9.09	56.80
70-74	2	7.27	84.57
75+	1	1.82	42.00
Total	36	100	
Crude	--	--	14.37
Adjusted	--	--	24.29

ASR: Age-Specific Rate per 100 000

of North of Jordan females. --Not applicable.
Adjusted: Age-adjusted rate

The age-adjusted rate was 24.29/100,000 females. 35-39 years age group showed a relatively high ASR, and then the rate slightly attenuated until 45-49 years of age group, when they gradually increased afterward with age, to reach the peak rate at 60-64 years of age group, then slightly declined (Table 2 and Fig 1).

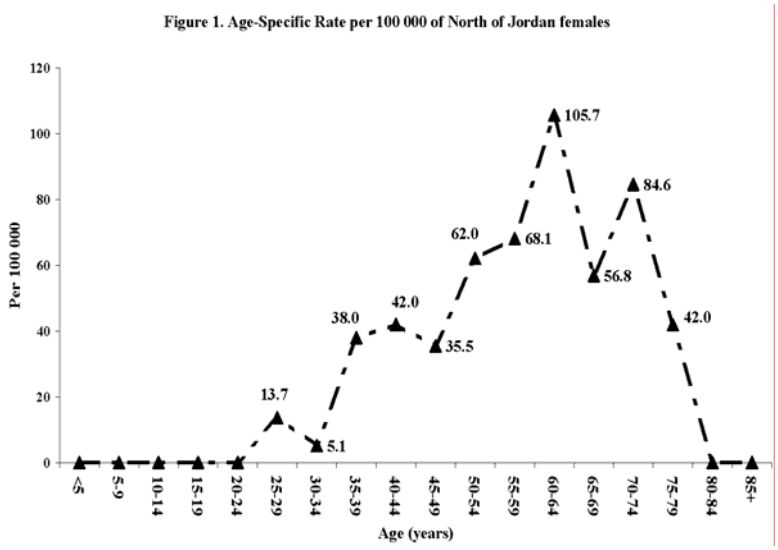

Fig 1. Age related pattern of breast cancer.

Table 3 shows that the age-adjusted rate of breast cancer of 16.65/100, 000 per year in the right breast and 7.64/100 000 in the left breast. The right-to-left SRR is 2.18.

Table 3. Age-adjusted rate of cancer in two sides.

Site	No.	%	Age-adjusted rate	Right-to Left SRR
Right breast	25	69.44	16.65	2.18:1
Left breast	11	30.56	7.64	
All	36	100	24.29	

The ULQ was the most frequent location of breast cancer (Table 4).

Table 4. Quadrant involvement in breast cancer.

Location	No.	%	Age-adjusted rate	SRR
Upper lateral quadrant	24	66.67	16.48	1
Upper medial quadrant	5	13.89	3.02	0.18
Lower medial quadrant	5	13.89	2.96	0.17
Lower lateral quadrant	2	5.56	1.10	0.07
All	36	100	24.29	

Table 5 shows that the infiltrating duct carcinoma was the commonest histological type of breast cancer accounting for 30 cases (86.11%). The age-adjusted rate was 21.41/100, 000 per year. The SRR is 0.08:1 for lobular-to-duct and 0.06:1 for mixed-to-duct carcinomas.

DISCUSSION

To the best of our knowledge, this is the first independent epidemiological study concerning the rate and pattern of breast cancer in the North Jordan. The age-adjusted rate of breast cancer in our study was 24.29/100,000 female population. Globally the rate of breast cancer is 37.4/100,000 females.[25] There are notable differences between breast cancer incidence rates in more developed versus less developed countries except for Japan. In the developed parts of the world, the rate is 63.6/100,000 females; in less developed areas, the rate is 51.4/100 000 females.[25] The highest rates were observed in North America (99.4/100,000),[5] followed by Western Europe (97.0/100, 000), Israeli Jewish (87.1/100,000), Scandinavia (81.3/100,000), Australia/New Zealand (80.7/100,000), Latin America and Caribbean (49.7/100,000), and Japan (33.1/100,000).[26] At the other end of the scale, the rates in South-Central Asia (22.1/100,000), Africa (23.4/100,000) and middle Africa (16.5/100,0000) are the lowest.[13,25,27]

Table 5. Histological types of breast cancer.

ICD-O code	Morphology	n	%	Age adjusted rate	SRR
8500	Infiltrating duct carcinoma	30	86.11	21.41	1
8520	Lobular carcinoma	3	8.33	1.65	0.08
8522	Infiltrating duct and lobular carcinoma	2	5.56	1.24	0.06
	All	36	100	24.29	

The age-standardized adjusted rate for female breast cancer in this study was 24.29/100 000 female population, compared to 45.6/100,000 female population that reported by national cancer registry in Jordan.[1] The epidemiological characteristics in this study showed the highest peak of ASR over 60 years of age; otherwise, after 35-39 years of age group, they gradually increase with age. It is somewhat consistent with a study from Egypt which reported highest occurrence of breast cancer among females aged from 50-60 years-old.[28] A study from Pakistan reported similar results.[29] A study from Lebanon reported that the age has to be a risk factor for developing breast cancer, and it is important that women in the age group 40-60 years abide by recommendations for an annual breast mammography.[30]

In this study, the right breast cancer was more common than left. This is consistent with a study from Egypt,[31] but different results were reported from Yemen,[32] although the reasons are unclear Cancer involving the ULQ were more prevalent than other quadrants. As mentioned earlier,

location of tumor on breast has been known to affect treatment options and survival in some cancers, the only variable that correlated with internal mammary chain drainage was tumor location.[14] The patients with tumors in the lower or central breast and positive axillary sentinel lymph nodes have increased incidence of drainage to the internal mammary chain.[33]
The Infiltrating duct carcinoma was more common than other histological types of breast cancer and constituted 86.1%. Studies from Pakistan reported that infiltrating duct carcinoma was the most common type.[29,34] Limitations of the present study include the restricted sampling of females seen at Prince Rashed Bin Al-Hassan Hospital and therefore, may not represent the whole population. Also, it did not include early cancer stages or pre-cancerous changes. Moreover, we did not study the factors associated with breast cancer. The rate in our study was lower than national cancer registry in Jordan. That may be attributed to the fact that some women with breast cancer in North Jordan attended other hospitals such as King Hussein Medical Center or to the private institutions.

CONCLUSION

The overall age-adjusted incidence rate of breast cancer in the North Jordan was 24.29/100,000 females. The rate increased with increasing age, and the women age of more than 40 years are likely to benefit the most from breast screening. The upper lateral quadrant was the commonest site and infiltrating duct carcinoma was the most common histological type.

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