



AN EPIDEMIOLOGICAL STUDY OF PATIENTS WITH BREAST CANCER IN NORTHERN IRAN, BETWEEN 2006 AND 2015

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Abstract – Background: Breast cancer is the most common cause of cancer-related mortality among women.

Patients and Methods: This cross-sectional study analyzed medical record data for 1058 patients with breast cancer at a referral center in Northern Iran.

Results: The mean age of the patients was 50 years, and the anatomical spread of breast cancer varied from regional to in situ. The cancer stage observed most frequently was stage IV, with stage IB the least frequent. Metastases were most commonly seen in bone, and the least frequent site was the brain. Overall, 71% of the patients were estrogen positive, 66% were progesterone positive, and 52% were HER2 positive.

Conclusions: Given the staging and metastasis diagnosis time observed in this study, further attention is warranted for developing preventive intervention systems that reinforce the educational system for early detection of breast cancer.

KEYWORDS: Epidemiology, Breast cancer, Brain, HER-2.

INTRODUCTION

Although recent decades have seen improvements in the prevention and control of infectious diseases, the incidence and prevalence of non-infectious diseases have increased. In most countries, cancer is considered to be the second leading cause of death after cardiovascular disorders. Cancer has become a major health crisis in Iran, ranking third in terms of mortality after coronary heart disease and injuries^{1,2}. Breast cancer constitutes about one-third of all cancers and is the most common cause of cancer-related mortality among women^{3,4} and is considered a significant issue in women's health worldwide⁵. However, in Asia have increased breast cancer risk. Asian women now have fewer children than used to be the case, they have children at an older age, and they experience a shorter duration of lactation⁶⁻⁸. Studies in Iran have shown an increase in the incidence of breast cancer-associated mortality from 3.93 per

hundred thousand in 2006 to 4.92 in 2010. Almost 97% of the 52,068 registered primary breast cancer patients in Iran are women³. Prevalence rates of breast cancer vary between countries^{9,10}. As yet, there has been no comprehensive study of the epidemiological status of patients with breast cancer in the north of Iran. Therefore, the aim of this study was to investigate and statistically analyze the data for breast cancer patients referred to the Touba Referral Center, the largest academic referral center in Mazandaran province, Northern Iran, between 2006 and 2015.

PATIENTS AND METHODS

This survey was a cross-sectional study to analyze the epidemiological status of all patients referred to the Touba Oncology and Chemotherapy Specialized Clinic of Breast Cancer, a referral center in the north of Iran. The study was

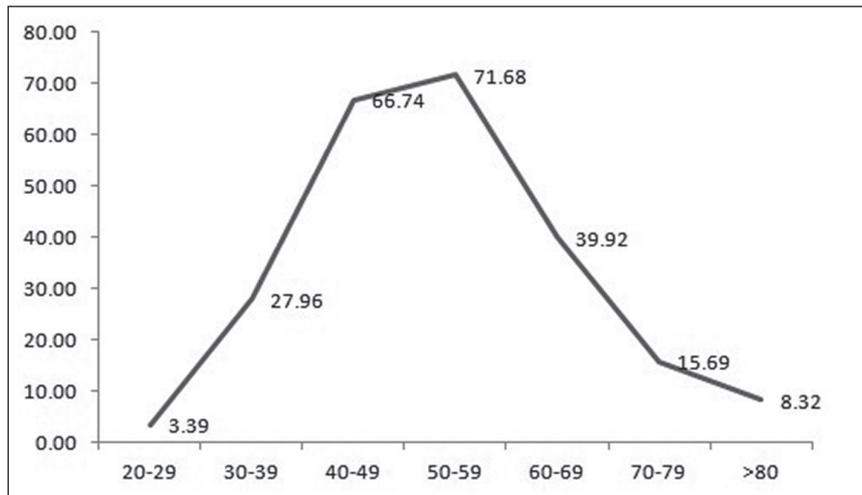


Fig. 1. The age-standardized incidence rate of breast cancer per 100,000 population in Mazandaran province, Northern Iran.

approved by Ethical Committee of Mazandaran University of Medical Sciences. The data for this project were extracted from patients' medical records for the period 2006-2015. In total, data for 1058 patients suffering from breast cancer were extracted and analyzed. The diagnosis of breast cancer was based on pathology reports. The following information was collected for each patient according to a checklist: age at breast cancer diagnosis, anatomical site of cancer, cancer stage, metastasis, and the immunohistochemistry profile. The inclusion criterion was all patients referred to the clinic with breast cancer, and the exclusion criteria were the termination of involvement or the patient's death. The data were analyzed using descriptive and single-variable methods, as well as the Mann-Whitney U test for evaluating comparisons, with SPSS statistical software. A p -value < 0.05 was considered to be statistically significant.

RESULTS

Data from the medical records of 1058 breast cancer patient were extracted and analyzed. The mean age of the patients was 50 years (range 20-92 years). The age-standardized incidence rate of breast cancer per 100,000 population in our region is shown in Figure 1.

TABLE 1. Anatomical site of cancer spread.

Spread type	Frequency	Percentage
<i>In situ</i>	133	12.6
Local	342	32.3
Regional	449	42.4
Distant	134	12.7

Table 1 presents the frequency and percentage of cases according to the involved anatomical site of cancer spread. Table 2 presents the distribution of cancer stage classification among the patients.

The frequency of breast cancer metastasis to various organs is shown in Table 3. As shown in the table, the bone was the most frequent site for metastasis and the brain the least frequent.

The immunohistochemistry profiles of the breast cancer patients are summarized in Table 4. Of these patients, 71.5% were positive for estrogen, 66.5% for progesterone, and 52% for HER2.

Table 5 shows the relationship between receptor status and the stage of breast cancer.

DISCUSSION

The aim of this study was to evaluate the epidemiological characteristics of breast cancer patients in Mazandaran province in Northern Iran and to compare these with the results of other studies in this field. The mean age of the patients was 50 years (range 20-92 years), which contrasted with the results of the studies by Haghghi et al (mean age, 44 years; range, 30-88 years) and

TABLE 2. Classification of cancer stage.

Stage	Frequency	Percentage
IIA	115	10.9
IB	5	0.5
IIA	228	21.6
IIB	197	18.6
IIIA	163	15.4
IIIB	37	3.5
IIIC	71	6.7
IV	242	22.9

TABLE 3. Metastasis status in patients with breast cancer (2006-2015).

Metastatic organ	Frequency	Percentage
Bone	102	42
Lung	25	10
Liver	18	7
Brain	8	4
Other organs	8	4
Multi-organs	81	33

Al-Shaibani et al¹¹. The highest and lowest degree of anatomical spread of breast cancer were regional and *in situ* respectively, which was in line with the findings of Tabeei et al¹². The cancer stage observed with the highest frequency in the present study was stage IV group and the least frequent was stage IB; this was consistent with the research conducted by Ginsburg et al¹³. This result highlighted the need for the health service of Northern Iran to devote greater attention in health policies to developing preventive plans and providing the required training for breast cancer screening. The most common organ for breast cancer metastasis in the present study was bone, with an average metastasis diagnosis time of 10 months. In this regard, establishing mammography seems to be important for facilitating early detection by the health system, developing preventive intervention planning, and reinforcing the educational system associated with the early detection process. In the present study, 71% of the breast cancer patients were estrogen positive, 66% were progesterone positive, and 52% were HER2 positive. Furthermore, the cancer stage was higher in the estrogen

receptor-negative patients, which was consistent with the results of Tabeei and colleagues¹². This finding suggests that measuring these receptors can be helpful for therapeutic purposes and for estimating disease prognosis. The ten-year trend of recording and filing new patients at Touba Referral Center had an increasing coefficient. This finding contrasts with the descending trend seen in Western countries⁴. A probable reason for this difference may relate to the greater focus on preventive planning in the long-term health policies of Western countries. The main points of this study can be summarized as follows. Considering the high frequency of patients at cancer stage IV and the metastasis diagnosis time observed in this study, it is essential to strengthen health and preventive intervention systems, develop educational systems, and increase focus on early detection planning and preventive screening in health policies in Iran. In this regard, estrogen receptor measurements can be beneficial for therapeutic purposes and to estimate the prognosis of the disease. A limitation of this study was its cross-sectional nature. However, its large sample size was a strength.

TABLE 4. Immunohistochemistry characteristics of the patients with breast cancer.

Receptor status	Estrogen (n=894)		Progesterone (n=889)		Her 2 (n=819)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Positive	639	71.5	591	66.5	426	52
Negative	255	28.5	298	33.5	393	48

TABLE 5. Relationship between the receptor status and stage of breast cancer.

Type of receptor	Mean rank of disease stage*	Receptor status	Analysis result**
Estrogen	Neg.	184	$p=0.05$
	Pos.	162	
Progesterone	Neg.	174	$p=0.3$
	Pos.	163	
Her 2	Neg.	142	$p=0.1$
	Pos.	157	

*A greater mean rank indicates a higher disease stage. **Mann-Whitney U test.



CONFLICT OF INTERESTS:

The authors declare that there is no conflict of interests regarding the publication of this paper.

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