Original Article

Investigation of the age trends in patients with breast cancer and different sizes of tumors in Breast Cancer Research Center of Isfahan University of Medical Sciences in 2001-2010

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ABSTRACT

Background: Breast cancer is the most common cause of death in women in the age range of 35-55 years. Each year, one or two cases of breast cancer per 1000 women are diagnosed as new cases. Despite the serious prognosis and high rate of morbidity, mortality, and pathogenicity, in the case of early diagnoses, the prognosis will be better. The aim of this study was to investigate the age trends in breast cancer patients with different sizes of tumors in Breast Cancer Research Center of Isfahan University of Medical Sciences in 2001-2010. **Materials and Methods:** The information in radiotherapy and oncology of Isfahan University of Medical Sciences and Milad Hospital from 2001 to 2010 were coded and analyzed. Frequency of patients' age groups, tumor sizes and the year of cancer diagnosis were calculated. Correlation test was used for data analysis in statistical analysis in social science (SPSS) software version 18. **Findings:** Among the 3722 patients with breast cancer, the highest relative frequency distribution, respectively was observed in the age of 40-49 years (34.4%), 50-59 years (26.6%), 30-39 years (17.7%), 60-69 years (13.2%), 20-29 years (2.5%), 70 years and older (5.2%) and less than 20 years. Relative frequency distribution of tumor sizes in a variety of 5 cm (T2) was with the frequency of 59.8%, and then 26% at 5 cm (T3), 10.5% at 2 cm (T1), 3.1% at T4 and 0.6 at *In-situ*, respectively. **Conclusion:** The investigation of age trends showed that diagnosis rate of breast cancer increased from 2001 to 2004. It reached its highest value in 2006 at the age range of 30-39 years. Then, the trend has been downward, and it has continued to decline until 2010, which could be the result of the equipping screening system and recording the malignant cases. 85.8% of the examined tumors in T2 and T3 group were visible and may be disturbing. Comparing the frequency distribution of the infected population showed that the highest incidence of breast cancer diagnosis were in the age range of 40-49 years. It seems that as long as the mass has not reached an obvious palpable state, it has not been diagnosed.

Key words: Age trends, breast cancer, Isfahan, tumor size

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INTRODUCTION

Breast cancer is the most common cause of death in women in the age range of 35-55 years. Each year, one or two cases of breast cancer per 1000 women are diagnosed as new cases.[1] American Cancer Society statistics showed that in 2010, there were 1,592,560 new cases of cancer and 490,569 cases of death from cancer in the United States. Breast cancer with the incidence of 192,380 new cases in 2009 was the most common cancer in women (27%) and the main cause of cancer deaths among them.[2] In Iran, as well, cancer is one of the most important health and treatment problems and is the major cause of death in the country after road accidents and cardiovascular diseases.[3] The risk of developing breast cancer in women in their lifetime is 12.5% (one case out of eight cases), and the risk of death from breast cancer is 3.6% (one case out of 28 cases).[4] In Iran, breast cancer is highly prevalent. According to the latest report on the country, breast cancer has been the third most common cancer in a total of men and women.[5] The highest incidence of breast cancer was among the women between the ages of 40-49 years.[6] The report of the Cancer Registry Center of the Ministry of Health and Medical Education of Iran showed that breast cancer has been allocated the most new cases of cancer (24.41% of all cancers in women) among the Iranian women. The study of Majid et al., found that women in Sulaymaniyah of Iraq had the age of onset of breast cancer in the age group of 35-39 years and by increasing the age, the incidence of breast cancer has been decreased in patients with higher ages.[7] The obtained information of the Egypt and Jordan studies were the same as the study of Sulaymaniyah of Iraq.[8] The most incidence of cancer in western countries was in the age group of 70-74, age group of 45-49 years in Taiwan and 55-59 years in Iraqi Kurdistan.[7] Isfahan is located in the first ranking of cancer in the country, and the breast cancer among women has been assigned the first place to itself. Based on the statistics of 2004, about 10% of breast cancer cases in the country have been reported in Isfahan.[9] Nokiani et al., study during 2001-2004 on women in Kermanshah province showed that the mean patient age was between 46 years and 34% were less than 40 years. These values are disturbing compared to western countries, which only 6% of the patients were less than 40 years.[10] Age is the main risk-factor for most human malignancies including breast cancer. Breast cancer in young women (under 35 years) is a rare disease and only 2% of patients at the time of diagnosis were in this age group.[11] Almost 70% of women on admission are in advanced stages of the disease. In this situation, therapeutic agents cannot do so much for them.[12] The exact size of the tumor and its spread at diagnosis has a significant impact on the type of surgery and adjuvant therapy for these patients. In Iran, 72% of patients are diagnosed with the tumor size of more than two centimeters and 63% of them with lymph node involvement at diagnosis, which shows the high emergence of advanced cancer in Iranian women at the presentation.[6] This size is 1.8 cm in western countries.[13] There is often a close link between tumor size and the final result of the disease. Generally, patients with small tumors (diameter of two centimeters or less) have a better prognosis than patients with having larger tumors (especially more than 5 cm in diameter).[14] Breast tissue is dense in young people and with increasing the age; it is being gradually replaced by fatty tissue. Despite the poor prognosis, high mortality, and morbidity, in the case of early diagnoses, the prognosis will be better for patients.[15] The overall risk of cancer is higher in old age; because of the time, that the person has been exposed to carcinogens is more. By the way, the immune system is also decreased with increasing age and people are more at risk. In this study, the obtained information from radiotherapy and oncology departments of Isfahan University of Medical Sciences and the Milad Hospital were analyzed by using the correlation analysis (Spearman correlation coefficient) in order to obtain a realistic picture of the age trends in tumors with different sizes, provided services and future needs for screening, prevention and treatment services.

MATERIALS AND METHODS

This study was a cross-sectional descriptive analytic study. The trend of diagnosis and treatment of the cancer requires specialized medical facilities. Information was studied from the records of patients in radiotherapy and Oncology Departments of Isfahan University of Medical Sciences and the Ultra Specialized Milad Hospital in 2001 and 2010. The information was categorized and coded and then the selected codes were collected and analyzed. There were 3,722 cases and the recent data were more complete than the early years. Data on age, gender, tumor size and year of cancer diagnosis were extracted from the files. Clinical data and tumor size are presented as indicators for breast cancer. Thus, the studied groups were included: In-situ tumors equal or less than 2 cm (T1), equal or more than two or less than 5 cm (T2), more than 5 cm (T3) and finally, any tumor that had spread to the skin or chest wall directly (direction extension) (T4). The statistical indicators, relative abundance and Spearman correlation coefficient were used for data analysis in SPSS software version 18. $P < 0.05$ was considered as statistically significant indicator of data.

FINDINGS

The age distribution of breast cancer during the studied years and based on the patient records in Table 1 showed that most of the patients who were diagnosed with breast cancer, respectively were in the age range of 40-49 years (with relative frequency 34.4%), 50-59 years (with relative frequency 26.6%), 30-39 years (with relative frequency 17.7%), 60-69 years (with relative frequency 13.2%), 20-29 years (with relative frequency 2.5%), 70 years and older and less than 20 years (with relative frequency 5.2%). Age trends of patients in groups of 10 years, based on the results in Table 1 and Figure 1 showed that breast cancer diagnosis' frequencies were increased from 2001 to 2004. The highest value reached in 2006 at the age of 30-39, and then the trend has been downward and has continued to decline until 2010. The results of Table 2 and Figure 2 showed that the most
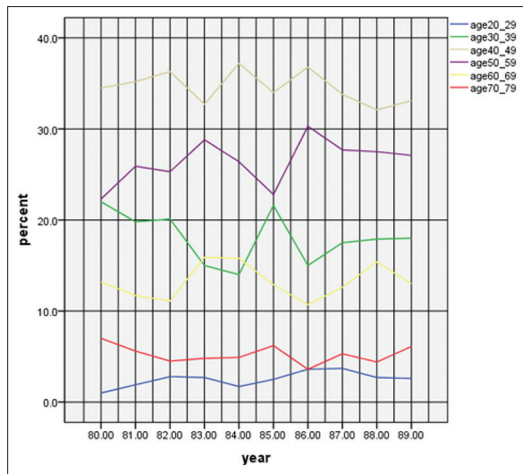
Figure 1: Age trends of breast cancer patients 2001-2010

Table 1: Frequency and relative Frequency of age distribution of patients by years of cancer diagnosis

years of cancer diagnosis	Age groups					
	20-29	30-39	40-49	50-59	60-69	≥70
2001	3	63	99	64	38	20
2002	6	64	114	84	38	18
2003	8	58	105	73	32	13
2004	9	50	109	96	53	16
2005	6	49	130	92	55	17
2006	10	87	137	92	52	25
2007	15	62	152	125	44	15
2008	12	79	153	125	57	24
2009	13	86	154	132	74	21
2010	15	103	189	155	74	35
Relative frequency	2.5	18.1	34.4	26.6	13.2	5.2

Table 2: Frequency and relative Frequency distribution of tumor sizes at age groups

Tumor size	Age group						Relative frequency
	20-29	30-39	40-49	50-59	60-69	≥70	
In-situ	0	6	9	6	0	1	0.6
T1	8	67	134	104	50	23	10.5
T2	48	371	751	606	309	112	59.8
T3	30	199	336	238	116	37	26
T4	2	21	36	27	13	15	3.1

distribution relative frequency of tumor sizes based on the age trend was 59.8% in T2 and thereafter, 26% in T3, 10.5% in T1, 3.1% in T4, and 0.6% In-situ and 0.6, respectively. The relative frequency distribution of studied tumors in T2 and T3 groups was 85.8%. The comparison of the frequency distribution of the studied population showed that the highest rate of breast cancer prognosis was in the age group of 40-49 years. Correlation analysis of the patient records showed that the correlation between age and year of diagnosis was not statistically significant. It was ($P = 0.90$) in patients with *In-situ* tumors, ($P = 0.917$) in patients with T1 tumor
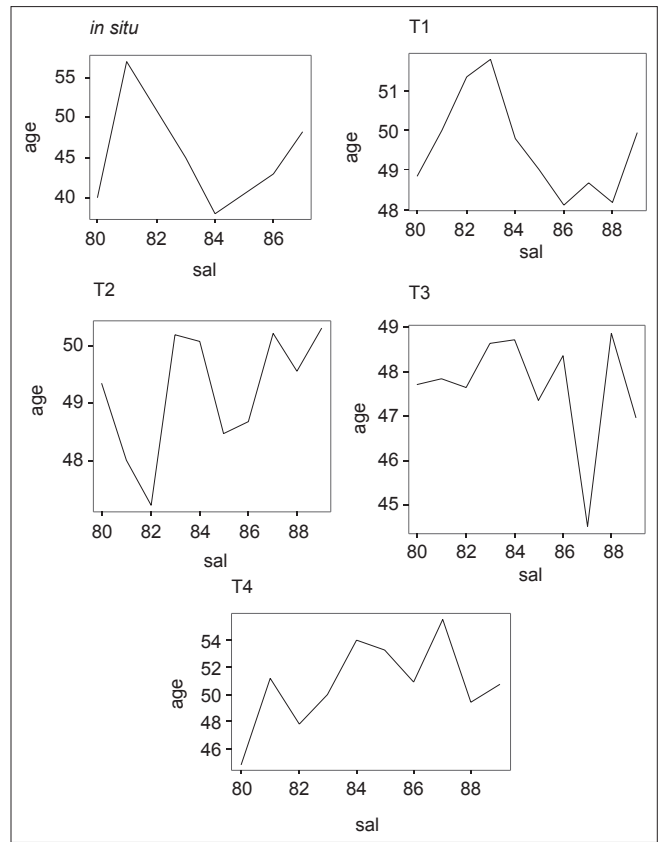

Figure 2: Age trends of breast cancer patients with different tumor sizes 2001-2010

size, ($P = 0.68$) in patients with T3 tumor size and patients with T4 tumor size ($P = 0.26$), while the group of patients with T2 tumor size had a positive correlation ($P = 0.032$).

DISCUSSION

The mean age of the patients in the study of Harirchi *et al*., in Tehran was mentioned as 48.8 years.[16] In the report of Mousavi *et al*., the age group of 40-49 years had the highest frequency among the patients.[6] In Ebrahimi *et al*., study, the age groups of patients with breast cancer have been lower than western countries.[17] Yavari *et al*., have reported 48.8 ± 9.8 years as the patients' mean age.[18] The results of the study of Babazadeh *et al*., calculated the mean age of the patients as 48.79 ± 11.85 years.[8] The mean age of breast cancer in Tunisia has been reported as 51 years.[19] In addition, the mean age of 50 years has been reported in the Arabic region.[20] In Hong Kong, India and Malaysia in comparison with western countries, the age group for breast cancer has been reported less than a decade in western countries.[8] In addition, black women (under the age of 40 years) are afflicted with breast cancer a decade earlier.[20] The results of the present study in Isfahan showed that the most patients were diagnosed with breast cancer at the age range of 40-49 years (34.4%). The investigation of age trends in groups of ten years indicated that prognosis of breast cancer increased from 2001-2004. In 2006, in the age group

of 30-39 years, it has reached the highest value and the trend has been downward and continued to decline until 2010. The results of Babazadeh *et al.*, study in Isfahan showed that more than 92% of patients had tumor sizes equal or larger than T2.[8] In Harirchi *et al.*, study, the frequency of T2 was reported 83% or higher.[16] Mousavi *et al.*, in the investigation of published Persian literature has reported this amount as 72%.[6] In addition, in Tunisia among the 1408 samples of breast cancers, the followings were indicated: 12.2% T1, 49.9% T2, 8.2% T3 and 24.7% T4.[19] The results of the present study showed these frequencies: 59.8% T2, 26% T3, 10.5% T1, 3.1% T4 and 0.6% *In-situ*. The results indicated that as long as the mass is not palpable and obvious, it has not been diagnosed. However, the obtained data from the studied tumor sizes showed a better trend of diagnosis and recording of the data in recent years. However, the frequency of 85.8% from the examined tumors in T2 and T3 groups were well visible and perhaps disconcerting. Therefore, comparing the relative frequency distribution pattern of the observed population showed that the most frequent diagnosis of breast cancer was in the age group of 40-49 years. On the other hand, about 17.7% of the patients in the age range of 30-39 were diagnosed with breast cancer, which suggests that, in patients under 39 years of age, referred to a physician later. These results would suggest the awareness of at risk women community and screening them. Therefore, it would be better to perform screening the diagnosis of breast cancer under the age of 39 years.

REFERENCES

1. Su Y, Wang H, Wang Y, Guo Y, Cheng H, Zhang Y, *et al*. Speckle reduction approach for breast ultrasound image and its application to breast cancer diagnosis. Eur J Radiol 2010;75:e136-41.
2. Jemal A, Siegel R, Xu J, Ward E. Cancer statistics, 2010. CA Cancer J Clin 2010;60:277-300.
3. Naghavi M, Jafari N. Pattern of mortality in 29 provinces of islamic republic of iran year for year 2005. Tehran: Iranina Ministry of Medical Education; 2008. p. ???. 35-47 p. 35-47
4. Saki A, Hajizadeh H, Tehranian N. Evaluating the risk factors of breast cancer using the analysis of tree models. (QHMS) Quarterly of the Horizon of Medical Sciences 2011;17:60-8.
5. Keihanian S, Ghaffari F, Fotokian Z, Shoorming R, Savari M. Risk factors of breast cancer in Ramsar and Tonekabon. JQUMS The Journal of Qazvin University of Medical Sciences 2010;14:12-19.
6. Mousavi SM, Montazeri A, Mohagheghi MA, Jarrahi AM, Harirchi I, Najafi M, *et al*. Breast cancer in Iran: An epidemiological review. Breast J 2007;13:383-91.
7. Majid RA, Mohammed HA, Saeed HM, Safar BM, Rashid RM, Hughson MD. Breast cancer in Kurdish women of northern Iraq: Incidence, clinical stage, and case control analysis of parity and family risk. BMC Womens Health 2009;9:33-35.
8. Babazadeh SH, Andalib A, Amuheidari A, Tabatabaeian M, Emami H, Adibi A. A study of the long-term trend of epidemiological and clinical indices of breast cancer in isfahan. JIMS Journal of Isfahan Medical School 2011;29:31-43.
9. Faghani M, Nasiri E, Bahadori M, Mohammad Ghasemi F. Genetic predisposing of P53 codon 72 on developing of breast cancer in postmenopausal women in Isfahan. Gums Guilan University of Medical Sciences 2008;67;94-100.
10. Nokiani FA, Akbari H, Madani H, Izadi B. Prevalence of breast cancer in breast sample reports in Iran, 2001-2004. Breast J 2007;13:536.
11. Alizadeh SA, Moshfeghi K, Kalantari M, Ebrahimi Kh. Lymph-node involvement and tumor markers in patients with breast cancer. AMUJ Arak university of medical sciences. 2010;2:44-50.
12. Behjati F, Atri M, Najmabadi H, Nouri K, Zamani M, Mehdipour P. Prognostic value of chromosome 1 and 8 copy number in invasive ductal breast carcinoma among Iranian women: An interphase FISH analysis. Pathol Oncol Res 2005;11:157-63.
13. Ghadyani M, Attarian H, Rezvani H, Eishi A, Abkhiz S, Badiee MR, *et al.* Comparison of axillary dissection in Iranian patients with breast cancer and other countries. Iran Surjery Iranian Journal of Surgery 2011;19:34-9.
14. Sadjadia AS, Olfatbakhsh R, Haghighat ShSecond chance, Help breast cancer patients. 1th ed. Second chapter, Tehran: Jihad, Tehran University of Medical Sciences; 2010. 33-34.
15. Prasad NS, HouserkovaD. A comparison of mammography and ultrasonography in evaluation of breast masses. Biomedical papers of the Medical Faculty of the Palacky University, Czechoslovakia. 2007;151:315-22.
16. Harirchi I, Ebrahimi M, Zamani N, Jarvandi S, Montazeri A. Breast cancer in Iran: A review of 903 case records. Public Health 2000;114:143-5.
17. Ebrahimi M, Vahdaninia M, Montazeri A. Risk factors for breast cancer in Iran: A case-control study. Breast Cancer Res 2002;4:R10.
18. Yavari P, Mosavizadeh M, Sadrol-Hefazi B, Mehrabi Y. Reproductive characteristics and the risk of breast cancer – A case-control study in Iran. Asian Pac J Cancer Prev 2005;6:370-5.
19. Maalej M, Hentati D, Messai T, Kochbati L, El May A, Mrad K, *et al*. Breast cancer in Tunisia in 2004: A comparative clinical and epidemiological study. Bull Cancer 2008;95:E5-9.
20. Joslyn SA, Foote ML, Nasseri K, Coughlin SS, Howe HL. Racial and ethnic disparities in breast cancer rates by age: NAACCR Breast Cancer Project. Breast Cancer Res Treat 2005;92:97-105.