

## RESEARCH ARTICLE

# Five Year Survival of Women with Breast Cancer in Yazd

Hossein Fallahzadeh<sup>1</sup>, Mahdieh Momayyezi<sup>1\*</sup>, Razie Akhundzardeini<sup>2</sup>, Sadegh Zarezardeini<sup>2</sup>

### Abstract

**Background:** Cancer is a non-communicable disease that is considered deadly in many cases. In recent years, the mortality rates from breast cancer have increased with increasing incidences. The present study was conducted to determine five year survival of women with breast cancer in Yazd, in the central region of Iran. **Materials and Methods:** In a prospective study, data were obtained from the patient's medical records with breast cancer that were referred to the Shahid Sadoughi hospital and radiotherapy center from 2002-2007 and followed up for 5 years. The data collected were analyzed by SPSS/16 and Kaplan-Meier test and log-rank test and Cox proportional hazard model was used. **Results:** The mean age of breast cancer diagnosis was  $48.3 \pm 11.7$  years. The 1-, 2-, 3-, 4- and 5-year cumulative survivals for breast cancer patients were 95%, 86%, 82%, 76% and 70%, respectively. There were significant differences with age distribution ( $p=0.006$ ). A significant decrease in the 5-year survival in patients with involvement of lymph nodes was also observed. **Conclusions:** Education for early diagnosis in women must be considered and these findings support the need for breast cancer screening programs.

**Keywords:** Breast cancer - survival rate - risk factors - Yazd

*Asian Pac J Cancer Prev*, 15 (16), 6597-6601

### Introduction

Cancer is a non-communicable disease that has been considered as one of the most deadly diseases in the world in recent decades (Bland et al., 2005). Current treatments for cancer often having multiple complications and high costs but the response to treatment in many cases is not complete (Vahdaninia et al., 2003).

The global burden of cancer is a growing trend in the coming years. The number of new cases is expected increase from ten million in 2000 to 15 million in 2020 that approximately 60% of these cases will occur in developing countries (Saki et al., 2011).

Breast cancer is increasingly regarded as a heterogeneous disease which can be classified into distinct molecular subtypes with prognostic significance (Lv et al., 2011). Breast cancer is the most common cause of death for middle-aged women in developed and developing countries and its prevalence rate increased rapidly in the 50 years and older. In recent years, the mortality rate from breast cancer has increased rapidly in all countries (Fouladi et al., 2011). Gynecologic and breast cancer cases account for 7.8% and 25.6% of total female cancers in Iran, respectively which are lower in comparison with those of some other countries (Arab et al., 2014).

Except in cases of genetics, breast cancer is rarely observed in women before 25 years old. Risk factors

associated with this cancer include increasing age, genetic background and less important factors include exposure to radiation, geographical influences, parity, late menopause, early menarche and obesity (Bland et al., 2005; Iglehart and Kaelin, 2001).

The highest rates of death from breast cancer have been reported in North America and Northern Europe, in South America and Southern Europe is medium and lowest in Asian and African countries (Akbari et al., 2006). In the United States of America in 2003, found 203,500 new breast cancer and 39,600 women died from this disease (Akbari et al., 2006).

Breast cancer is the second cause of death due to cancer. Incidence of Breast cancer is 10 cases per 100,000 people and 7,000 new cases annually in Iran (Akbari et al., 2008). Thus, in recent years the service of prevention, early detection and appropriate treatment of cancer has been considered to improve the survival rate of cancer (Vahdaninia et al., 2003).

There are many ways to treat breast cancer, which are different according to the grading and staging of the cancer and the patient's physical condition and his demand (Yaghmaei et al., 2008). Researchers have done a lot of research for the estimated five years survival in breast cancer patients. Survival rates indicate the percentage of patients with a particular type of cancer that are live in the fifth year of diagnosis (Vahdaninia et al., 2003). This

Department of Biostatistics and Epidemiology, Research Center of Prevention and Epidemiology of Non-Communicable Disease, Faculty of Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran \*For correspondence: mahdieh\_momayyezi@yahoo.com

rate is 80-90% if the lymph nodes are not involved. But this rate is 60-75% if axillary lymph nodes are involved (Yaghmaei et al., 2008).

Due to the relatively high rate of breast cancer in women and also the importance of determine the survival rate after diagnosis and treatment of breast cancer, this study conducted to determine five year survival of women with breast Cancer in Yazd.

## Materials and Methods

This study is a prospective study (survival analysis). Patients who participate in this study were that Cancer was confirmed in during the diagnosis process and pathology. A total of 200 patients were selected from 2002-2007 and followed up for 5 years.

Data for this study were obtained from the patient's medical records with breast cancer that were referred for treatment to the Shahid Sadoughi hospital and radiotherapy center in Yazd .

The study took place in Yazd, one of the large cities of the Islamic Republic of Iran, is the center of Yazd Province. Yazd province is located 750 km south of the capital Tehran. It has a hot and dry weather and a population of 750,000, of whom 84% are literate (Fallahzadeh H, 2010).

Initially the forms were designed to collect information. Patients were divided into the following groups according to the age: younger than 50, 50-59 years, 60 and years older.

This information form was included: pathological type (ductal carcinoma, lobular carcinoma and medullary carcinoma), lymph node involvement (yes/no), affected

side (right, left, both), type of treatment (chemotherapy, surgery & chemotherapy, surgery & chemotherapy & radiotherapy), type of surgery (Simple mastectomy, Radical mastectomy, Modified radical mastectomy, Lumpectomy and No surgery) and tumor size.

Then Patient records were collected from archive hospital and Department of Pathology and Their data entered to information forms and incomplete information was collected through telephone contact with the patient or their family.

After 5 years, the patient's vital status (alive - dead) were asked through telephone contact with patients or their families and in cases of death, date of death was asked from the patient. Accordingly, survival t is calculated from date of diagnosis to the end of the study period (5 years).

The data collected were analyzed by spss/16. The survival time according to variables was determining by using the Kaplan-Meier test and also, log-rank test was used to compare survival time in subgroups. Cox proportional hazard model was used to assess the effects of independent variables on survival time and risk of each of the variables.

## Results

All cases of breast cancer diagnosed until 2002 were identified from Shahid Sadoughi hospital and radiotherapy center in Yazd. The closing data follow up was 14 June, 2007.

The mean age of the patients was 48.29±11.7 years. More than half (58.9%) of patients were younger than 50 years. 5.95% of the patients were married, and 4.5% were single. After five years, 62.5% of women diagnosed with

**Table 1. Patient Characteristics and Five Year Overall Survival in 2006-2010**

Variable		Number	(%)	Means of survival	p value
Affected Side	Right	82	44.8	49.4±1.8	0.046
	Left	87	47.5	52.7±1.4	
	Both	14	7.7	42.4±5.5	
Lymph Node Involvement	Yes	14	12.7	48.8±1.3	0.002
	No	96	87.3	55.1±2.1	
Type of Pathology	Ductal Carcinoma	137	85.1	52.5±1.2	0.382
	Lobular Carcinoma	12	7.5	51.1±4.1	
	Medullary Carcinoma	12	7.5	40.7±5.8	
Type of Treatment	Surgery, Chemotherapy	50	25.3	50.3±2.1	0.69
	Surgery, Chemotherapy & Radiotherapy	134	67.7	50.5±1.4	
	Chemotherapy & Radiotherapy	14	7	52.8±3.3	
Type of Surgery	Simple Mastectomy	37	19.2	46.9±3.1	0.314
	Radical Mastectomy	41	21.2	50.8±2.2	
	Modified Radical Mastectomy	92	47.7	51.6±1.5	
	Lumpectomy	23	11.9	54.73±2.97	
Tumour Size(Length)	<9Mm	9	5	53.0±3.7	0.99
	10-19Mm	27	15	49.9±3.2	
	20-29Mm	25	14	49.1±3.8	
	>30Mm	117	66	50.7±1.4	
Tumour Size (Width)	<9Mm	32	18	48.6±2.9	0.969
	10-19Mm	24	13.48	51.3±2.7	
	20-29Mm	39	21.9	48.5±2.9	
	>30Mm	83	46.62	51.8±1.6	
Age at Diagnosis (Years)	<50	113	58.85	52.3±1.4	0.006
	50-59	42	21.9	49.7±2.4	
	60>	37	19.27	47.2±2.9	

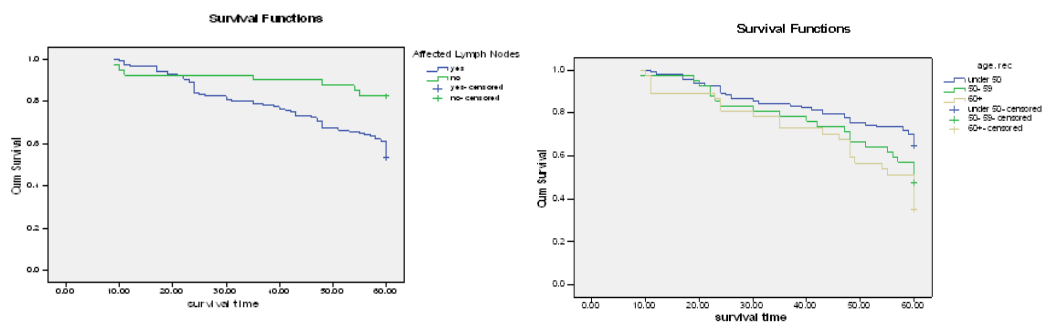


Figure 1 Survival Rates. A) by lymph node involvement; b) by age at diagnosis

Table 2. Hazard Ratios for Survival Rate by Age at Diagnosis, Affected Side and Lymph Node Involvement in Women with Breast Cancer

Variable	HR	CI	p value
Age at diagnosis (years)			0.032
<50	1		
50-59	1.41	0.67-2.94	0.357
60>	2.6	1.3-5.3	0.009
Affected side			0.183
right	1		
left	0.7	0.38-1.33	0.278
both	1.7	0.65-4.38	0.278
Lymph node involvement			0.099
Yes	1		
No	0.47	0.19-1.57	0.099

breast cancer are a live and 37.5% of them are death. The 1-year until 5-year cumulative survival for breast cancer patients was 95%, 86%, 82%, 76% and 70%, respectively. There were significant differences in age distribution and survival rates ( $p=0.006$ ). The Survival rates have shown a decreasing trend with increasing age.

The patients younger than 50 years had better survival as compared with the patients older, so advancing age at diagnosis associated with lower survival. Clinical characteristics and average of the survival rate based on the variables was shown in Table 1.

There were significant differences between lymph node involvement and survival rates. ( $p=0.002$ ) A significant decrease in the 5-year survival in patients with involvement of lymph nodes was observed. So that, 40.1% of patients with lymph node involvement and only 17.5% of the patients without lymph node involvement died during the study (5 years) The results showed that the survival rate is lower when both sides (right and left breast) were involved. ( $p=0.04$ )

Women who had not undergo surgery and those only treated by Chemotherapy were associated with better survival. Also, women who had smaller tumor size had a higher survival rate, but there was no significant a significant relationship.

Table 2 showed the relative factors affecting on 5-year survival rate for breast cancer patients. According to the result of multivariable Cox proportional hazard regression, age at diagnosis was significant predictors of survival rate in women with breast cancer. Although lymph node involvement and the sides involved had high odds ratio but there was no a significant relationship.

## Discussion

The present study showed the 5-years relative survival rate of breast cancer patients an epidemiological review of articles from 1998 to 2005 that examined was performed to study the characteristics of breast cancer in Iran showed that 5-years survival rate of breast cancer ranged 65-73% (Mousavi et al., 2007). Fouladi and et al. in their study showed that the overall 5-years survival was 51% for breast cancer in Ardabil (North-West of Iran) (Fouladi et al., 2011). The overall 5-years survival rate was for breast cancer in Semnan (Iran) province was 58% (Yaghmaei et al., 2008). However, Akbari and et al. showed 5-years survival rate of breast cancer patients referred to Shohada-e-tajrish and Jorjani hospitals in Tehran was 76.5% (Akbari et al., 2006). The overall 5-year survival rate of breast cancer patients in Malaysia was 49% which was lower comparing to studies in Iran.

Survival rates have increased in recent years due to improvements in health care services. So that, the studies were conducted to assess the cancer statistics in united state showed that survival rate of breast cancer has increased from 85% in 1989-1994 to 90% in 2001-2007 years (Landis et al., 1998; Siegel et al., 2012). The 5-years survival was found 88.1% in Germany in 2005-2008 (Holleczek and Brenner, 2012).

The findings presented here suggest that survival rate in our study was lower than developed countries such as United State and Germany and was higher than developing countries such as India (Gajalakshmi et al., 1997) which may be due to the differences in the Population pyramid in various countries (that has been confirmed by studies in this field in Iran (Gohari et al., 2006; Vahdaninia and Montazeri, 2004), appropriate awareness of patients about self-examination and disease risk, advanced technology and differences in race of people in the world.

The finding indicated that the mean age at diagnosis was  $48.29 \pm 11.7$  year, similar to other Iranian study such as Afsharfard et al. (2013) ( $49.35 \pm 13.1$ ), Najafi et al. (2013) ( $47.9 \pm 9.6$ ) and Fouladi et al. (2011) ( $45.5 \pm 12.3$ ) but is different from developed countries (Parkin and Fernandez, 2006; Smigal et al., 2006). The majority of cases were below the 50 years which have the same pattern with a number of studies (Mousavi et al., 2008; Yaghmaei et al., 2008; Sajadi et al., 2009; Najafi et al., 2013). Also, the reduction in the incidence of breast cancer in the elderly patients has been investigated in other studies (Tomatis et al., 1990).

The finding indicated that age of incidence of breast cancer was a significant prognostic factor. We found that woman aged less than 50 years old had better survival compared to women aged more than 50 years old which has been indicated in other studies (Fisch et al., 2005; Abdullah et al., 2013). The better survival rate in women which were younger than 50 years observed in present study that may be due to proper awareness of disease signs, self-examination and diagnosis in early stage.

The result showed that 68.5% of patients had lymph node involvement. A literature review indicated 63% of the mentioned patients had lymph node involvement (Mousavi et al., 2007). Other studies conducted in Iran have reported different numbers. For example, in Afsharfard's study 87.3% patients showed evidences of lymph invasion (Afsharfard et al., 2013). Also, Najafi et al showed that 57.7% of cases had lymph node involvement. (Najafi et al., 2013)

Also, patients who hadn't lymph node involvement significantly associated with high survival rate and the mortality rate were lower in them. Lack of lymph node involvement was suggested as a prognostic factor for breast cancer in the similar studies (Thomson et al., 2004; Thomson et al., 2004; Webb et al., 2004; Clayforth et al., 2007). The findings showed that patients who had a tumor in left breast had the better survival rate than right breast. This result also indicated in a similar study by Akbari and et al (Akbari et al., 2006).

The majority of patients with smaller tumor size had the better survival. Clayforth and et al. found that small tumor size contributed to survival rate (Clayforth et al., 2007). Treatment with lumpectomy surgery was also associated with the better survival which was similar with result of fouladi's study (Fouladi et al., 2011). Modified radical mastectomy was the most common method of surgery compared to other method which was similar with the result of another study done in Iran. (Afsharfard et al., 2013)

Ductal carcinoma was found in 85% of the mentioned patients so that, their survival rate was higher than other type of pathology. This finding also indicated by a review study was conducted in Iran (Mousavi et al., 2007; Afsharfard et al., 2013; Najafi et al., 2013). Limitation of this study were did not examine the survival rates and mortality rates according to disease stage

Therefore, early diagnosis of the breast cancer by different approaches at early stages of disease and finding cancer before lymph node involvement can lead to a considerable reduction in mortality for women. Imparting a high quality breast cancer awareness and early diagnosis initiative at this juncture can help to consolidate the gains and also tackle knowledge, resource and psychosocial barriers (Sreedevi et al., 2014). Najafi et al. showed that the mortality rate will be reduced by using screening mammography and useful adjuvant therapy. (Najafi et al., 2013) The results of other studies indicate a need to develop health promotion programs directed at the female population so as to increase periodic health exams and improving access for disadvantaged communities to preventive health exams (Peltzer and Phaswana-Mafuya, 2014). In this context, the role of health educators and

health center staff is decisive to improve survival rate.

## Acknowledgements

The researchers feel themselves obliged to the prevention and epidemiology of non-communicable disease research center due to Guidance and Counseling for doing this study.

## References

- Abdullah NA, Wan Mahiyuddin WR, Muhammad NA, et al (2013). Survival rate of breast cancer patients in Malaysia: a population-based study. *Asian Pac J Cancer Prev*, **14**, 4591-4.
- Afsharfard A, Mozaffar M, Orang E, Tahmasbpour E (2013). Trends in epidemiology, clinical and histopathological characteristics of breast cancer in Iran: results of a 17 year study. *Asian Pac J Cancer Prev*, **14**, 6905-11.
- Akbari ME, Mirzaei, Soori H (2006). 5 year survival of breast cancer in shohada-e-tajrish and jorjani hospitals, *HAKIM*, **9**, 39-44.
- Akbari ME, Khayamzadeh M, Khoshnevis SJ, et al (2008). Five and ten years survival in breast cancer patients mastectomies vs breast conserving surgeries personal experience. *IJCP*, **1**, 53-6.
- Arab M, Noghabaei G, Kazemi SN (2014). Comparison of crude and age-specific incidence rates of breast, ovary, endometrium and cervix cancers in Iran, 2005. *Asian Pac J Cancer Prev*, **15**, 2461-4.
- Bland KI, Beenken SW, Copeland EM, et al (2005). Schwartz's Principles of Surgery. 8th ed, New York: McGraw-Hill, 453-99.
- Clayforth C, Fritschi L, McEvoy SP, et al (2007). Five-year survival from breast cancer in Western Australia over a decade. *Breast*, **16**, 375-81.
- Fallahzadeh H(2010). Quality of life after the menopause in Iran: a population study. *Qual Life Res*, **19**, 813-9.
- Fisch T, Pury P, Probst N, et al (2005). Variation in survival after diagnosis of breast cancer in Switzerland. *Ann Oncol*, **16**, 1882-8.
- Fouladi N, Amani F, Harghi AS, et al (2011). Five year survival of women with breast cancer in Ardabil, North - West of Iran. *Asian Pac J Cancer Prev*, **12**, 1799-801.
- Gajalakshmi CK, Shanta V, Swaminathan R, et al (1997). A population-based survival study on female breast cancer in Madras, India. *Br J Cancer*, **75**, 771-5.
- Gohari MR, Mahmoudi M, Kazem M, et al (2006). Recurrence in breast cancer analysis with frailty model. *Saudi Med J*, **27**, 1187-93.
- Holleczer B, Brenner H (2012). Trends of population-based breast cancer survival in Germany and the US: decreasing discrepancies, but persistent survival gap of elderly patients in Germany. *BMC Cancer*, **12**, 317.
- Iglehart JD, Kaelin CM (2001). Diseases of the breast. In: Townsend CM, editor. Sabiston Textbook of Surgery, The Biological Basis Of Modern Surgical Practice, 6th ed, Philadelphia: *WB Saunders*, 555-559.
- Landis SH, Murray T, Bolden SH, et al (1998). Cancer statistics, *Cancer*, **48**, 6-30.
- Lv M, Li B, Li Y, et al (2011). Predictive role of molecular subtypes in response to neoadjuvant chemotherapy in breast cancer patients in Northeast China. *Asian Pac J Cancer Prev*, **12**, 2411-7.
- Mousavi SM, Montazeri A, Mohagheghi MA, et al (2007). Breast cancer in Iran: an epidemiological review, *Breast*

- J*, **13**, 383-91.
- Mousavi SM, Mohagheghi MA, Mousavi Jerrahi A, et al (2008). Outcome of breast cancer in Iran: a study of Tehran center registry data. *Asian Pac J Cancer Prev*, **9**, 275-78.
- Najafi B, Anvari S, Roshan ZA (2013). Disease free survival among molecular subtypes of early stage breast cancer between 2001 and 2010 in Iran. *Asian Pac J Cancer Prev*, **14**, 5811-6.
- Parkin DM, Fernandez LM (2006). Use of statistics to assess the global burden of breast cancer. *Breast J*, **12**, 70-80.
- Sajadi A, Gregory H, Bajdik CH, et al (2009). Comparison of breast cancer survival in two populations: Ardabil, Iran and British Columbia, Canada. *BMC Cancer*, **9**, 381-86.
- Saki A, Hajizadeh E, Tehranian N (2011). Evaluating the risk factors of breast cancer using the analysis of tree models. *J Gonabad Uni Med Sci*, **17**, 60-9.
- Siegel R, Naishadham D, Jemal A (2012). Cancer statistics. *CA Cancer J Clin*, **62**, 10-29.
- Smigal C, Jemal A, Ward E, et al (2006). Trends in breast cancer by race and ethnicity: update 2006. *CA Cancer J Clin*, **56**, 168-83.
- Sreedevi A, Quereshi MA, Kurian B, et al (2014). Screening for breast cancer in a low middle income country: predictors in a rural area of Kerala, India. *Asian Pac J Cancer Prev*, **15**, 1919-24.
- Thomson CS, Brewster DH, Dewar JA, et al (2004). Scottish cancer therapy network, improvements in survival for women with breast cancer in Scotland between 1987 and 1993: impact of earlier diagnosis and changes in treatment. *Eur J Cancer*, **40**, 743-53.
- Tomatis L, Aitio A, Day NE, et al (1990). Cancer: Causes, Occurrence and Control. Lyon, International Agency for Research on Cancer. *IARC Sci*, **100**, 69-71.
- Peltzer K, Phaswana-Mafuya N (2014). Breast and cervical cancer screening and associated factors among older adult women in South Africa. *Asian Pac J Cancer Prev*, **15**, 2473-6.
- Vahdaninia M, Harirchi A.M, Montazeri A (2003). Five-year survival in Iranian breast cancer patients: a prospective study. *PAYESH*, **2**, 141-8.
- Vahdaninia M, Montazeri A (2004). Breast cancer in Iran: a survival analysis. *Asian Pac J Cancer Prev*, **5**, 223-25.
- Webb PM, Cummings MC, Bain CJ, et al (2004). Changes in survival after breast cancer: improvements in diagnosis or treatment. *Breast*, **13**, 7-14.
- Yaghmaei S, Bani Hashemi G, Ghorbani R (2008). Survival rate following treatment of primary breast cancer in Semnan, Iran (1991-2002). *Semnan Uni Med Sci*, **9**, 111-7