

The Relationship of gravidity with the Frequency of Removed Lymph Nodes in Mastectomy and Involved Lymph Nodes after the Surgery in Women with Breast Cancer

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Abstract

Background: Breast cancer is the most common fatal cancer among women worldwide and it has an increasing rate in Iranian women. The aim of this study was to determine the relationship of gravidity with removed lymph nodes and involved lymph nodes after mastectomy surgery in women with breast cancer.

Methods: In this descriptive-analytical study, 111 women with breast cancer, who had undergone mastectomy surgery, were studied. Demographic and clinical characteristics of patients were extracted from their medical files and recorded in a questionnaire. Data were analyzed through SPSS 22 and by using descriptive statistics, ratios differences, mean differences and linear regression.

Results: Mean age of patients was 49.8 ± 10.9 years and mean BMI was 27.4 ± 5.4 Kg/m². Mean number of removed lymph nodes was 7.8 ± 5.2 and in 50% of the patients, mean number of involved lymph nodes after the surgery was 4.2 ± 3.5 . The disease was significantly more prevalent among those who were employed, married, had academic education, and aged over 45 years. According to Linear regression model, each 1.06 year age increase was significantly associated with one more removed lymph node and each gravidity increase was associated with one less removed lymph node and approximately two more involved lymph nodes after the surgery.

Conclusion: The results showed that age and gravidity are the most effective factors in the development of lymphadenopathy, especially in increasing the involved lymph nodes after the surgery. Therefore, enhancing the awareness of women about appropriate screening methods for early detection of breast cancer and regular check-ups after surgery is essential to reduce the probable problems.

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Introduction

Breast cancer is the most common malignancy among women worldwide (1). In fact, breast cancer accounts for 30% of all cancers and 15% of cancer deaths among women (2).

According to the report of World Health Organization (WHO), in February 2009, breast cancer was the cause of 519 thousand deaths per year worldwide (3). In Iran, breast cancer is the fifth most common cause of death among women and

7500 new cases per 100000 individuals have been reported per year (4). Annually, more than 8 million cases of different types of cancer are reported in the world that about one million of them are breast cancer cases (5).

The age at onset of breast cancer is lower in developing countries like Iran compared to developed countries. In Iran, most of deaths from breast cancer occur in the age group of 40-49 years, while in the developed countries, most of cancer deaths occur in the age group of 55-60 years (6). According to another study, the average onset ages of breast cancer in Western countries and Iran are in the 50-60 and 45-55 age groups, respectively (7).

In a study that investigated the risk factors of breast cancer in Iran, it was revealed that risk of breast cancer reduces with increase of the gravidity and increases with increase of body mass index (8). According to a study performed during 1996 to 2000 in the University of the West Indies, USA, the risk of developing breast cancer increased by 30 percent in women who did not have history of pregnancy and it has been mentioned as the most important risk factor of breast cancer (9).

The results of other studies showed that old age, the first childbirth after 30 years of age, no history of childbirth, high body mass index and inappropriate lifestyle (inappropriate nutrition and inadequate physical activity) are the main risk factors of breast cancer (10, 11). In addition, breastfeeding duration has a significant relationship with the risk of breast cancer (12).

In 1992, Hinpeng et al performed an extensive study on 620 women (200 patients with breast cancer and 420 healthy subjects) in Singapore, France, and UK to investigate the risk factors of breast cancer in women. They found that the most important premenopausal risk factor was the age of the first pregnancy, and the main postmenopausal risk factors were age and high-fat diet (13)

According to American Cancer Society report in 2008, about two-thirds of cancer deaths were due to tobacco use and another one-third was due to obesity or overweight,

inadequate physical activity, and inappropriate nutrition (14). In other studies, obesity, alcohol consumption, and inadequate physical activity were reported as risk factors of cancer (15).

Breast cancer cannot be cured and we do not have enough knowledge about prevention of this cancer yet (16). The disease, clinically, has a long incubation period and after about 8 to 10 years, a cancer cell becomes a tangible tumor (15).

Since the health of society depends on women's health who have heavy responsibilities towards family and society and play major roles in different aspects of society such as science, culture and art, physical and mental health of women is essential. Hence, it is necessary to identify women's health risk factors, especially risk factors of breast cancer which is the most common cause of women's death. In addition, it is essential to identify the factors related to cancer severity using different methods. Therefore, the aim of this study was to investigate the relationship of gravidity with removed lymph nodes and involved ones after mastectomy surgery in women with breast cancer.

Methods

In this descriptive-analytical study, 111 women who had undergone mastectomy surgery in Cancer Research Center and ShohadayeTajrish hospital affiliated to Shahid Beheshti University of Medical Sciences, Tehran/ Iran during 2012 to 2014 were investigated. Demographic and clinical characteristics of selected women including reproductive status, surgical and pathological information to identify the features of cancer, type of surgery, type of treatment, and the number of infected lymph nodes after the surgery were collected using medical files and recorded in a questionnaire by specialized experts. The reliability (0.87) and validity (0.81) of the questionnaire were measured using Cronbach's alpha test and Kendall test, respectively. Moreover statistics related to Tehran women ≥ 25 years old in 2012 were used for comparison with the relative frequency of patients in the present study.

Data were analyzed through SPSS22. In the first stage, Kolmogorov-smirnov statistical test was used to assess the

normality of variables, Leven test was used to check the equality of the variance, and Durbin-Watson test was used to check the suitability of the linear regression. Then, descriptive statistics was used to show the absolute and relative frequency of data compared to the general population and Kruskal-wallisH test and Mann-Whitney U were used to compare the means. To illustrate the lymphadenopathy-associated factors, multiple linear regression with confidence interval of 95% and $P \leq 0.05$ were used.

Results

Mean age of participants was 49.7 ± 10.94 years, mean BMI was 27.4 ± 5.4 Kg/m², mean gravidity was 2.4 ± 1.7 , and mean parity was 2.1 ± 1.5 which was not statistically different with mean of parity in general population of 25 years and older women of Tehran in 2012 (1.9 ± 1.2). Mean number of removed lymph nodes was 7.8 ± 5.2 and 50% of the patients who reported recurrence after the surgery had 4.2 ± 3.8 involved lymph nodes after the surgery.

The results also showed a significant difference in the frequency of this disease among different age groups, so that the highest prevalence was observed in the age group of 45 years and higher. Moreover, women with university degrees, married and working women were significantly more affected (table 1). Overall, mean number of lymph nodes (removed and involved) was 12.21 ± 10 in the age groups of 49 years and higher (Table 2).

Based on the obtained results, in patients who had undergone mastectomy surgery, by increasing every 1.06 years of age, one infected lymph node developed and in 50% of the patients, the number of involved lymph nodes increased after the surgery.

Results also showed that with each gravidity increase, about one less lymph node was removed (Table 3), while about two more lymph nodes were involved after the surgery (Table 4). No significant relationship for other variables such as tumor size and location, height, weight, BMI, and abortion was found.

Table 1. Frequency distribution of women referred to the Cancer Research Center compared with the frequency of the female population of Tehran ≥ 25 years old in 2012 (17)

Variables	Frequency			P-value	
	this study n=(111)		Female Population of Tehran ≥ 25 years old in 2012		
	Number	Percentage	Percentage		
Age (year)	<27	0	(0)	34.4	0.001
	27-37	12	(10.8)	19.7	
	38-48	43	(38.7)	21.3	
	≥ 49	56	(50.5)	24.6	
Occupational Status	Employed	68	(61.3)	43.36	0.001
	Housewife	43	(38.7)	56.64	
Marital Status	Single	5	(4.5)	36.58	0.001
	Married	97	(87.4)	63.1	
	Divorced and Non-specified	9	(8.1)	0.32	
Educational Status	Primary school	8	(7.2)	15.9	0.05
	Secondary school	62	(55.9)	62.3	
	higher education	41	(36.9)	21.8	

Table 2. Frequency distribution of gravidity and lymphadenopathy in women underwent the mastectomy surgery by age

Lymph Nodes status	Gravidity									
	0	1	2	3	≥4	0	1	2	3	≥4
Age Groups	Average of removed lymph nodes	Average of involved lymph nodes After mastectomy	Average of removed lymph nodes	Average of involved lymph nodes After mastectomy	Average of removed lymph nodes	Average of involved lymph nodes After mastectomy	Average of removed lymph nodes	Average of involved lymph nodes After mastectomy	Average of removed lymph nodes	Average of involved lymph nodes After mastectomy
37-27	6.28±4.7	3±1.41	4±5.2	3±0	5.5±6.36	1±0	-	-	-	-
48-38	9.1±3.9	4.6±4.4	8.1±5.9	3.3±2.08	7.2±4.08	4.6±5.4	10.8±6.5	3.6±1.67	9.5±3.1	4.66±4
≥49	11.6±6.6	1±0	12.5±3.5	1±0	5.5±5.4	2±1.4	8.6±4.7	5.09±6.1	9.8±6.9	7.57±5.3
Mean	9±5.1	2.9±1.9	8.2±4.9	2.5±0.8	6.1±5.3	2.6±2.3	9.2±5.6	4.6±5.1	9.7±6.5	7.05±5.2

Table 3. Factors related to the lymph nodes (Removed) in women with breast cancer undergoing mastectomy surgery using linear regression method

Variables	B	T	95% Confidence Interval B		P-value
			Lower Bound	Upper Bound	
Age	2.21	2.36	0.35	4.07	0.02

Table 4. Factors related to the frequency of lymph nodes (involved) after mastectomy surgery in women with breast cancer using linear regression method

Variables	B	T	95% Confidence Interval B		P-value
			Lower bound	Upper bound	
gravidity	0.9	2.14	0.06	1.75	0.037
Age	2.29	1.98	0.032	4.6	0.05

Discussion

The findings of this study showed that age increase has a significant relationship with increase of removed lymph nodes through mastectomy surgery and involved lymph nodes after the surgery. But, gravidity had a significant relationship only with involved lymph nodes after the surgery.

Although, other variables such as occupational status, education, and marital status had a significant relationship with breast cancer, no relationship between these variables and lymphadenopathy was found.

The mean age of women with breast cancer was about 50 years, which is consistent with similar studies, and according to these results, the age at onset of breast cancer in Iran, like other developing countries, is lower than that in developed countries (6,7).

Mean BMI of patients was 27.4±5.4 Kg/m², indicating that the studied patients were overweight, but the number of removed and involved lymph nodes after mastectomy surgery had no significant relationship with BMI. Some studies have

shown that increase in the body mass index (BMI) might be associated with increase of breast cancer risk (8,11,15), which is inconsistent with the results of the present study. However, to investigate the relationship between the number of involved lymph nodes and the risk of developing cancer, more studies are required.

Since, in the present study, the relationship of the progress and stage of breast cancer with demographic characteristics, especially age of marriage and gravidity, showed some differences compared with other studies, case-control studies with larger population are required to determine the contribution of each variable in the development of lymphadenopathy.

According to the results of the present study, with each 1.8 year age increase, 3 more lymph nodes were involved and the number of involved lymph nodes after the surgery increased. Women with age of 45 years and higher had the highest mean number of involved lymph nodes (12.21 ± 10); therefore, women in this age group are more susceptible to malignancy, progression of breast cancer and increase of the number of involved lymph nodes.

It has been shown that age could be one of the risk factors of breast cancer (10,11). In another study, it has been reported that the risk of non-recovery increased 1.26 times per year (19), which is consistent with the results of the present study. Based on our results, women's age can be considered as a risk factor for both developing breast cancer and its recurrence.

In 1992, Hinpeng et al performed an extensive study on 620 women (200 women with breast cancer and 420 healthy women) in Singapore, France, and UK to investigate the risk factors of breast cancer. According to their results, the most important postmenopausal risk factors for breast cancer were age and high-fat diet (13).

According to previous studies, mean age of menopause in Iranian women is 48.2 years and women in this age are at higher risk of developing breast cancer in comparison to the age group of 56-60 years who are in postmenopausal period

(19, 20). Our results are consistent with the results of the mentioned studies. It has been also observed that gravidity increase is associated with increase of the number of involved nodes (20), which is consistent with the results of the present study.

Studies showed that being nulligravida is one of the main risk factors of breast cancer, so that it increases the risk of breast cancer by 30%. Furthermore, breastfeeding duration has a significant relationship with developing breast cancer, so that increase of this period can reduce the risk of breast cancer, which is inconsistent with the results of this study. Due to the few number of breastfeeding women in the present study, we could not conclude about this relationship (9-12).

Finally, based on the results of other studies and the significant results of the present study, pregnancy might reduce the risk of breast cancer, but it might increase the number of involved lymph nodes after mastectomy; therefore, more case-control studies are required in this regard.

Conclusion

The results of this study show that gravidity increase leads to less lymph nodes removal, but it is one of the main factors which increases the number of involved lymph nodes after mastectomy surgery, so that in more than half of the patients after the surgery, the number of involved lymph nodes increased. Therefore, it is recommended to enhance the awareness of women about appropriate methods of screening for early detection and regular checkups after surgery to reduce probable problems.

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