Fertility: A Control Factor for Post Mastectomy Pain Syndrome in Breast Cancer Patients

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Abstract

Background: Normally, surgery is the first choice of treatment for breast cancer which brings about side effects as chronic pain. Post mastectomy pain syndrome (PMPS) is one of the most prevalent side effects in breast cancer survivors as a chronic neuropathic pain lasting more than three months. The precise mechanisms and risk factors connected to chronic pain after breast surgery are not identified.

Objectives: This study is aimed at identifying the effects of fertility on PMPS after breast surgery in breast cancer patients.

Methods: In this case-control study, a total number of 111 women were studied. Of these, 56 women were diagnosed with positive PMPS and place in the case group, and 55 patients without pain were selected as the control group. The patients' demographic and clinical information were collected by means of a questionaire and their medical files. Descriptive statistics and inferential statistics, chi-square, Mann-whitney U, Regression Logisitic (Backward), were used to analyze the data in SPSS 22 software.

Results: According to the acquired results, the mean age of the study population was 49.77 ± 10.94, the mean weight was 69.5 ± 11.45 kg, the mean height was 160 ± 8.14 centimeter and mean BMI was 27.4 ± 5.4. All in all, the results showed that fertile women were more likely not to suffer from PMPS compared to nulipar women, and there was not a correlation between psychological disorders or other diseases, and PMPS.

Conclusions: Fertility is not only a decrescent factor of breast cancer, but also reduces PMPS in breast cancer patients. Encouraging timely fertility, and pregnancy and lactation cares must be the major part of reproductive health education programs.

Keywords: Fertility, Breast Cancer, PMPS, Women

1. Background

Breast cancer is the most prevalent cancer type in women across the globe. As reported by the American health organization, annually more than 1.6 million new cases of breast cancer are identified globally which comprises 10% of all new cancer cases and 23% of cancers in women. It is estimated that nearly 4.4 million women around the world have been diagnosed with breast cancer during the past 5 years (1-3). Age of onset of breast cancer is lower in Iran, likewise other developing countries, compare to developed countries. The most common age of mortality of breast cancer is 40 to 49 years old in Iran, which is 55 to 60 in developed countries (4).

Different treatments for breast cancer are: Breast surgery, radiotherapy, chemotherapy, and hormone therapy, all with side effects including chronic pain (5). PMPS

is a common side effect following the breast surgery (6, 7). Post mastectomy pain is a chronic pain in chest wall, axilla and upper half arm which starts at over three months after the mastectomy and lasts (8). The pain is usually sudden, radiant and burning (5, 9). The syndrome is categorized as chronic pain (9). The chronic post surgery pain is partially neuropathic. The neuropathic pain is even reported in early stages after the surgery (10, 11). The syndrome has a rather high prevalence- reported in 20% - 68% of women who underwent the surgery (7, 12, 13). Chronic pain ca cause difficulties in daily activities and their quality of life will suffer as well (8). Depression, which is the most prevalent disease accompanying a neuropathic pain, is a case in point of disorders caused by chronic pain. Some studies have reported its prevalence up to 100% (14). In line with the research, pain, especially chronic pain, is highly prevalent among the Iranian population (15). Chronic pain

brings about problems not only for the patient, but also for his. her significant people as well as the health care system and the society. Chronic pain decreases productivity, causes absent from work or even unemployment (16, 17). Although the exact mechanism of PMPS is not clearly identified yet, it can be considered a neuropathic pain which is probably triggered as a result of damage to the axillary and chest wall nervous system after mastectomy (6, 7, 13). Although studies on the effects of fertility and nerve agents on PMPS were not found, evidence from some researches implies that chronic pain is prevalent in women by Cesarean section (6% - 55%) (10). Some studies reported that the +30 age at the first parturition and having no history of parturition are the cancer risk factors (18, 19). In a study on the risk factors in Iranian population showed that the more the number of pregnancies, the less the risk of breast cancer will be (20). Other studies revealed that variables of age and BMI are two risk factors of PMPS (6, 8, 9, 21), and similar studies reported a correlation between pain syndrome, and age and BMI (22, 23).

2. Objectives

Thus, this study is aimed to determine the effects of fertility on PMPS and potential factors of this syndrome in breast cancer survivals (similar studies were not found).

3. Methods

3.1. Research Design

This is a case-control study where the participants were women who underwent mastectomy in cancer research center at Shahid Beheshti University of Medical Sciences between 2011 and 2013 hospitalized in Shohadaye Tajrish hospital.

3.2. PMPS Definition

Based on definitions in previous studies (6, 7), there are three criteria to identify this type of pain: type, site and duration of pain. Therefore, if it appears as numbness, tingling, radiant, wound or burning pain in axilla, arms, shoulders and chest on the treated side and lasts for more than three months, it is known as PMPS.

3.3. Procedures

In this case-control study, a total number of 111 women were studied. Of these, 56 women were diagnosed with positive PMPS and place in the case group, and 55 patients without pain were selected as the control group. The study made use of a self made PMPS questionnaire used in Shahbazi et al. (16). It consists of three parts: part 1 with 13 questions about personal details, their fertility status including the total number of pregnancies, parturition and abortion as well as whether they used psychiatric medications; part 2 including 10 questions on pain indicators and identification of PMPS; and part 3 with 15 questions about surgery and pathology to identify cancer type, type of surgery, type of treatment and pathology of the patents. The reliability and validity of the questionnaire were 0.87 and 0.81 respectively.

3.4. Statistical Analysis

The data were analyzed by SPSS (version 22) software. Statistical test applied to investigate the normality of variables was Kolmogorov-Smirnov, and Leven test was utilized to analyze the equality of the variances. Mann-Whitney U test was used to compare means within two groups, Logistic Regression Backward was used to show the odds ratio in two groups with confidence interval 95% and P < 0.05.

4. Results

Number of 56 patients in PMPS positive group and 55 patients in PMPS negative group were enrolled in the study. The highest prevalence was in married women (87.4%), women who had diploma in education (41.4%), and housewives (61.3%). Height and weight were not also significantly different between PMPS positive and negative cases (P > 0.05).

There was a significant distribution of PMPS in women with a high school diploma and above together with working women P < 0.05 and there was a significant difference between educational but not Marital status (P = 0.85) (Table 1).

The most prevalence of breast cancer was in Gravid 3 (48.6%) and higher (36.9%) women. The mean of gravidity was 2.43±1.73, the mean of parity was 2.09 ± 1.57 and mean of abortion was 0.34 ± 0.61.

Based on the acquired results, women with higher mean of fertility were less likely to suffer from the syndrome (P = 0.06) and there was not a correlation between Weight, Height, Age, Parity, Abortion and PMPS P < 0.05 (Table 2).

Other results depicted that chances of not suffering from PMPS in fertile women was higher than those of women with no fertility history (the mean ratio is 2.32). The highest ratio is that of women with two fertility experience (3.7) (Table 3).

Table 1. Comparison of PMPS Distribution in Qualitative Variables in Female Breast Cancer Patients Who Underwent Surgery[a]

Characteristics	PMPS Positive (n = 56)	PMPS Negative (n = 55)	Total (n = 111)	P Value[b]
Employment status				0.03
Employed	29 (51.8)	39 (70.9)	68 (61.3)	
Unemployed	27 (48.2)	16 (29.1)	43 (38.7)	
Marital status				0.85
Single	3 (5.41)	2 (3.6)	5 (4.5)	
Married	49 (87.5)	48 (87.3)	97 (87.4)	
Divorced	5 (9.1)	4 (7.1)	9 (8.1)	
Education				0.001
Less than high school	3 (4.4)	9 (16.4)	12 (10.8)	
high school	9 (16.1)	3 (5.5)	12 (10.8)	
diploma	16 (28.6)	30 (54.5)	46 (41.4)	
Higher education	28 (50)	13 (23.6)	41 (36.9)	
Nerve agents intake				0.12
No	36 (62.5)	42 (76.4)	78 (70.3)	
Yes	20 (35.7)	13 (23.6)	33 (39.7)	

[a]Values are expressed as No. (%).
[b]Chi-square.

Table 2. Comparison of Qualitative Variables Means in Case and Control Groups[a]

Characteristics	PMPS Positive (n = 56)	PMPS Negative (n = 55)	P Value[b]
Weight	69.28 ± 9.43	69.8 ± 13.2	0.82
Height	159.32 ± 5.71	160.74 ± 10	0.15
Age	48.94 ± 10.61	50.74 ± 11.24	0.34
Pregnancy	2.16 ± 1.75	2.71 ± 1.73	0.06
Parity	1.87 ± 1.5	2.31 ± 1.63	0.16
Abortion	0.28 ± 0.6	0.4 ± 0.62	0.21

[a]Values are expressed as mean±SD.
[b]Mann-Whitney test.

Table 3. Effective Variables on PMPS in Female Breast Cancer Patients With Surgery

Variable	Odds Ratio	95% C.I. for EXP (B)		P Value
		Lower	Upper	
Pregnancy (0)	1 (Reference)	-	-	-
Pregnancy (1)	2.2	0.695	6.852	0.18
Pregnancy (2)	3.7	0.911	14.87	0.057
Pregnancy (3)	2.12	0.71	6.48	0.18
Pregnancy (4 ≥)	1.29	0.43	3.82	0.65

5. Discussion

Based on the results, fertility affects PMPS in women and women with fertility history suffered significantly less from PMPS. In a study by Ghiasvand et al. (2011), the results showed that cancer risk reduces when the number of preg-

nancies increases (20), and other studies reported that lack of reproductivity history is risk factor of cancer (18, 19). Also, the length of breastfeeding has a positive correlation with breast cancer risk meaning that the longer the length of breastfeeding, the lower the risk of breast cancer (16). This means that fertility in women is an effective factor in reducing the risk of breast cancer and PMPS in women. This study also affirms that there is no correlation between PMPS and psychological disorders or nerve agent intake; however, this need further research to since there was not enough evidence in the body of literature. Moreover, the results showed that age and weight had no effect in incidences of PMPS which is in line with the findings from other studies. These studies reported that younger ages and higher BMI (obesity) were two risk factors for PMPS (8, 9). There is evidence to prove that young age has an influential role in developing PMPS (6, 21). However, other findings provide no evidence of this correlation. For instance, a study by Montgomery and Bovbjerg in 2004 showed no correlation between age and acute pain in women who had breast surgery (22). Results from another retrospective study by Meijuan et al. (2013) showed no significant relation between BMI and PMPS (23).

5.1. Conclusion

Many studies conclude that timely fertility and breastfeeding are effective factors in reducing breast cancer compared to women with no experience of reproductively (18-20). As well, this study concludes that PMPS is less common in breast cancer patients with fertility who underwent surgery than women without fertility. Therefore, health care programs are highly recommended to focus on programs to encourage timely fertility and breastfeeding. Due to lack of similar studies, further researches should be performed in future.

Acknowledgments

Footnotes

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