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Assessment of Breast Cancer Incidence in Patients with Mastalgia and Routine Screening

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Abstract

Objective: In this trial, we searched the incidence of breast cancer among the patients complained of breast pain and control group referred to our clinic.

Methods: Between January 2017 and June 2018, 1884 patients who applied to our breast clinic were classified into two groups considering the exclusion criteria. Participants with routine-screening or control (group 1) and patients with mastalgia (group 2) were retrospectively evaluated.

Results: A total of 1884 women were included in the research. Following exclusion criteria: The 'mastalgia group' comprised 646 patients who had a mean age of 43.4 and the control group 647 patients who had a mean age of 44.2. There was no statistically significant difference in age between control with breast pain groups. Mammography was performed in 45.9% of the control group and 39.1% of the mastalgia group, and US was performed in 90.7% of patients with the control group and 93.1% in the mastalgia group. There was a important correlation between the two groups concerning BIRADS classification in mammography. BI-RADS category was higher in mastalgia group. In both groups, five patients were found to have breast cancer. All patients who had breast cancer were non-cyclic in mastalgia group. The patients who had cancer; five in the control group and four in the mastalgia group were in the postmenopausal period, and one in the mastalgia group were in the premenopausal period.

Conclusion: There was no increase in the incidence of cancer in patients presenting with breast pain. However, most patients with breast pain are exposed to imaging methods to exclude the cancer suspicion.

Keywords

Breast pain, Cancer, Screening, Mammography, US

Introduction

Breast pain is a frequent complaint of up to 80% of women in a period of women's life. Mastalgia is described as tension, discomfort, and ache in one or both breasts [1]. The prevalence of cancer in patients manifesting with breast pain is reported to be 0-3.2% [2-5] and in one study up to 7% [6]. As breast cancer awareness increases, the concern that breast pain may indicate malignancy contributes to the tendency of breast pain to be the most common breast symptom and leads to a woman consulting a primary care physician or breast surgery [3,6,7]. If patients are not treated according to the symptoms and physical examination, they may be referred for assurance to a breast imaging facility [4,5,8]. Breast pain is usually examined in two types, is not cyclic and cyclic, and is diffrentiated from non-breast pain. Cyclic mastalgia is a unilateral or bilateral pattern of pain or tenderness, frequently associated with swelling, becoming waxy and then diminished with the menstrual cycle.

This justifies up to 70% of patients with mastalgia [2,9], most of whom do not supply the usually approved criteria for premenstrual syndrome [10], proposing that it is a different entity.

Although breast cancer does not consider a cause of cyclic breast pain, some studies have identified a possible relationship between cyclic mastalgia and breast cancer risk [11,12].

Noncyclic mastalgia tends to be unilateral and is more local than cyclical breast pain. The location of the pain can usually be definitely localized and repeated by

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the patient and the doctor. Typically, most women who had non cyclic mastalgia are in the fourth or fifth year of life at the time of diagnosis [1,13].

In accordance with the American Cancer Society, the present recommendations for mammography in women aged between 40 and 55 are still yearly. Women 55 and older can exchange to a mammogram every other year. Women under the age of 50 who have very dense breasts can benefit from digital mammography, US and/or contrast-enhanced MRI [14].

In younger women (below 40 years of age), breast cancer is more difficult to diagnose because breast tissue is usually more intense in older women than in breast tissue. Furthermore, breast cancer in young women may be aggressive and less likely to respond to treatment. The American Cancer Society (ACS) suggests performing a monthly breast self-examination for all women over 20 years of age. In addition to monthly breast self-examination, an annual clinical breast examination is recommended for all women from the age of 20 years. Women under the age of 40 with a family history or other risk factors for breast cancer should discuss their risks and an appropriate screening program with health professionals [14].

We aimed to investigate the results and findings of female patients who applied to our outpatient clinic with mastalgia and routine screening to determine the frequency of malignancy and searched whether there is an increase in the incidence of breast cancer in patients with mastalgia.

Materials and Methods

Study population

The research was conducted in the Breast Clinic of the Private Hospital, between January 2017 and June 2018. Local Clinical Ethical Board approved the study and informed consent was received from all womens.

1884 womens who applied to our breast clinic were assigned into 2 groups considering the following exclusion criteria: The 'asymptomatic group or control group', which included womens experiencing routine breast screening (n = 647); and the 'mastalgia group', which included womens admitted to outpatient-clinic because of breast pain (n = 646).

Exclusion criteria were breast cancer history, palpable breast mass, nipple withdrawal and/or breast nipple discharge, structural disorder, pregnancy or breastfeeding, trauma to the chest skin, presence of abscesses, suspected entities, previous thoracic surgery, family history, or hormone replacement treatment. Based on the exclusion criteria, 646 womens suffering from breast pain and 647 patients with routine screening were retrospectively screened by using the hospital file system. Age, gender, menopausal status, and breast pain type (cyclic, non-cyclic) of the womens

were examined.

Our diagnosis algorithm of patients with mastalgia complaints is as follows

All ultrasonography images and mammography examination were acomplished by a radiology specialist. A mammogram was taken prior to the US (≥ 40 years) in the elderly and initially reached the US in younger womens. In the instance of intense breast pattern presence on the mammogram, the womens performed US in addition. Womens aged ≥ 40 years who had experienced mammography in the previous six months were assesed with ultrasonography and prior mammograms.

Routine screening algorithm of the patient is as follows

Annual mammography is being performed in routine control of patients with 40 years and older of ages. According to mammography findings, US and/or MRI are performed when necessary. Womens below 40 years of age are routinely screened with the US. Mammography and/or MRI are performed if necessary.

Imaging

All US exams were performed with A General Electric VOLUSON 730 PRO US (General Electric Medical Devices, USA). All mammary exams were collected performing a Siemens MAMMOMAT Balance (Siemens Healthcare, Germany) and craniocaudal and mediolateral oblique breast images were collected. The screens were evaluated by a Picture Archiving Computer System (PACS). All the mammographic detections were examined using Breast Imaging Reporting And Data System (BI-RADS) principles and glossaries defined by the American College of Radiology (ACR).

Statistical analysis

Statistical examination was carried out using *SPSS software* (Version 20.0, SPSS Inc., Chicago, IL, USA). If continuous variables were normal, they were described as the mean ± standard deviation ($p > 0.05$ in Kolmogorov-Smirnov test or Shapira-Wilk (n < 30)), and if the continuous variables were not normal, they were described as the median. The continuous variables were compared by the use of *Student t test* depending on parametric values; respectively. The categorical variables between the groups were analyzed by using the Chi-square test or Fisher's Exact Test. The level for statistical importance was predetermined at $p < 0.05$.

Results

1884 women were included in the research. Following exclusion criteria: The 'mastalgia group' comprised 646 womens with a mean age of 43.4 ± 11.7 (range 13-77) and the control group 647 womens with a mean age of 44.2 ± 11.9 (range 14-86). There was no

Table 1: Patients demographic characteristics.

	Group 1 (Control)		Group 2 (Mastalgia)		
	n	%	n	%	p
Mastalgia type					
Cyclic	-	-	95	14.7	-
Non-Cyclic	-	-	551	85.3	
Menopausal status					
Premenopausal	379	58.6	404	62.5	0.190
Postmenopausal	268	41.4	242	37.5	
Mammography					
Taken	297	45.9	253	39.1	-
Not taken	350	54.1	393	60.9	
US					
Taken	587	90.7	602	93.1	-
Not taken	60	9.3	44	6.9	
US					
Normal	298	50.8	271	45.0	**0.049**
Findings	289	49.2	331	55.0	
Mammography					
BIRADS 0	27	9.1	0	0.0	**0.0001**
BIRADS 1	142	47.8	92	37.1	
BIRADS 2	116	39.1	133	53.6	
BIRADS 3	9	3.0	18	7.3	
BIRADS 4	2	0.7	4	1.6	
BIRADS 5	1	0.3	1	0.4	
BIRADS 6					
Breast density					
Almost entirely fat (type 1)	125	42.1	11	4.6	**0.0001**
Scattered fibroglandular tissue (type 2)	136	45.8	97	40.8	
Heterogeneously dense (type 3)	27	9.1	72	30.3	
Extremely dense (type 4)	9	3.0	58	24.4	
Malignancy	5	0.8	5	0.8	1.000
Age	Mean ± SD	Median (Min-Max)	Mean ± SD	Median (Min-Max)	
	44.2 ± 11.9	45 (14-86)	43.4 ± 11.7	44 (13-77)	0.195

statistically significant difference in age between control with breast pain groups (p = 0.195) (Table 1). Mastalgia type of womens in group 2 was cyclic in 14.7% whereas, 85.3% was non-cyclic.

Of the patients in Group 1, 58.6% were premenopausal and 41.4% postmenopausal while in group 2, 62.5% were premenopausal and 37.5% postmenopausal. There was no statistical significance between two groups (p = 0.190).

Mammography was performed in 45.9% of the control group and 39.1% of the mastalgia group, and US was performed in 90.7% of patients with the control group and 93.1% in the mastalgia group.

There was a important correlation between the two groups concerning BIRADS classification in mammography. BI-RADS category was higher in mastalgia group. BI-RADS 1 was 47.8% in the control group and 37.1% in the mastalgia group, while 39.1% in the BI-RADS 2 control group and 53.6% in the mastalgia group. BI-RADS 3 was 3% and 7.3%, respectively (p = 0.0001). Regarding breast density, there was an association between two groups. Breast parenchyma density was observed more densely in the breast pain group (p = 0.0001).

US findings of 50.8% of the patients in group 1 and 45.0% in group 2 were normal respectively. Lesions were detected in 49.2% in control group and 55.0% in mastalgia group (p = 0.049). The most common benign lesions in both groups were fibrocystic, fibroadenoma and ductal ectasia. There was no important correlation between the two groups regarding lesion distribution (Table 2).

In both groups, five patients (0.8%) were found to have breast cancer. Two of the ten patients who were diagnosed with cancer were detected by US as the first image and by mammography with US in the other eight patients.

According to mammography findings; BIRADS4 in 2 patients and BIRADS5 in 1 patient were present in the control group while BIRADS4 in 4 patients and BIRADS5 in 1 patient were found in the mastalgia group. In patients with cancer, type 3 densities were observed in 2 womens in the control group and four womens in the mastalgia group. Type 2 densities were detected in 1 patient in both groups.

All patients were diagnosed with cancer by performing a trucut biopsy. Pathologic findings revealed

Table 2: Findings in US.

	Group 1 (control)		Group 2 (Mastalgia)		p
Normal	298	50.8	271	45.0	
Cyst	138	23.5	162	26.9	
Complicated cyst	12	2.0	17	2.8	
Fibroadenoma	29	4.9	16	2.7	
Solid mass	11	1.9	23	3.8	
Duct ectasia	28	4.8	30	5.0	
Accessory breast tissue	12	2.0	12	2.0	
Lipoma	2	0.3	8	1.3	
Intra-mammarian lymph node	5	0.9	4	0.7	
Benign axillar lymph node	6	1.0	3	0.5	
Epidermal Cyst	11	1.9	6	1.0	
Cyst and fibroadenoma	17	2.9	24	4.0	
Malignancy	5	0.9	5	0.8	
Atypic fat lobule	1	0.2	2	0.3	
Intraductal papilloma	0	0.0	1	0.2	
Others	12	2.0	18	2.9	0.137

Table 3: Patients who had breast cancer; demographic and pathologic data.

	Group 1 (control) N = 5		Group 2 (Mastalgia) N = 5	
	n	%	n	%
Menopausal status				
Premenopausal	0	-	1	20
Postmenopausal	5	100	4	80
US	2	100	-	
Mammography				
BIRADS 4	2	40	4	80
BIRADS 5	1	20	1	20
Breast density				
Scattered fibroglandular tissue (type 2)	1	20	1	20
Heterogeneously dense (type 3)	2	40	4	80
Mastalgia type				
Cyclic	-		0	-
Non-Cyclic	-		5	100
Pathology				
Carcinoma *in situ*	0	-	1	20
Lobular carcinoma *in situ*	1	20	1	20
Invasive ductal carcinoma	4	80	3	60
Age	Mean	Range (Min-Max)	Mean	Range (Min-Max)
	57.8	51-67	51.2	45-56

that; in the control group, invasive ductal carcinoma was found in 4 patients and lobular carcinoma *in-situ* in one women. In the mastalgia group, invasive ductal carcinoma was observed in 3 patients, lobular carcinoma *in-situ* in one women and carcinoma *in situ* in 1 patient. Of these womens; five in the control group and four in the mastalgia group were in the postmenopausal period, and one in the mastalgia group were in the premenopausal period (Table 3).

All patients who had breast cancer were non-cyclic in mastalgia group. Age distribution of these patients was as follows: 57.8 (range 51-67) in the control group, 51.2 (range 45-56) in the mastalgia group.

Discussion

Mastalgia is one of the most frequent breast symptoms leading to women in the breast clinic. Assesment of mastalgia depends on the determination of three broad classification of cyclic mastalgia, noncyclic mastalgia, and menopausal status (premenopausal and postmenopausal) [3,15,16].

Even though studies support the view that no strong relations exist between breast pain and breast cancer, the uneasiness and fear of breast cancer caused by pain are persistent [17,18]. Several studies suggest that cyclic breast pain may be an independent and beneficial clinical sign of rised breast cancer risk [19,20], particularly in premenopausal women. Nevertheless, other researchers have shown a protecting effect of breast cancer risk, leading patients to early medical care [21] and have not presented a general rise in breast cancer risk [5,20]. In our study, breast cancer rate in patients with mastalgia (n = 646) was 0.8%. 4 of the patients were postmenopausal, and one was

premenopausal. Mastalgia type was non-cyclic in all cases. In routine- screening group breast cancer rate was 0.8% and all of the patients with breast cancer in this group was postmenopausal.

Breast imaging for any type of breast pain can help determine if there is a underlying and curable cause. It is not performed simply to rule out breast cancer. Even if it is negative, screening is beneficial to relieve the women's anxiety and to provide guidance on possible treatment options with relevant physicians. Reassurance is often shown as the main reason for imaging these patients. Howard, et al. [22] showed that the initiation of an imaging assessment of breast pain in a negative clinical examination did not lead to an increase in cancer detection compared to non-breast pain, but more importantly, that additional clinical and imaging use rates increased above the initial imaging.

Breast pain is one of the indications for diagnostic mammography listed in the ACR Application Manual for Scanning and Diagnostic Mammography Performance [23].

In our study mammography was performed at 39.1% and US was done in 93.1% of the patients who complained of mastalgia. US in young women is preferred to mammography. Loving, et al. [24] showed 100% sensitivity with 100% negative predictive value in breast US with focal mammary manifestations and symptoms in women under 30 years of age. In a retrospective study by Leung, et al. [25], 99 patients who presented with focal breast pain without associated palpable mass had 110 targeted US examinations (65% of patients had mammography).

No cancers were detected at the site. The authors concluded that imaging is primarily beneficial for patient assurance in patients with focal breast pain targeting US. However, their patient populations, mostly young patients with no family history of breast cancer, were low risk.

In a retrospective research of Tumyan, et al. [4], diagnostic mammography and US evaluation were performed in 86 consecutive patients with a complaint of focal breast pain without palpable mass. Four cancers were detected (4.6%): Two in areas of pain (2.3%) and two incidentally, in unrelated to the area of pain. Both cancers in the region of pain were seen both in mammography and in US.

Duijm, et al. prospective follow-up study of 987 patients (1992-1996, two-year follow-up) [5], assesed breast screening (range; age 10-86) in women with only mastalgia (diffuse or focal). The control group was 987 asymptomatic women who applied for a screening mammogram. Of the womens in the mastalgia group, 0.8% had breast cancer, whereas 0.7% of the control group who had no symptomatic. In our research, the incidence of cancer in the mastalgia and control group was 0.8% respectively.

Limitation of our study was retrospective in nature. Prospective, multicentric, and follow up studies are needed.

Conclusion

When we compare patients with mastalgia symptom and routine control, there is no difference in the incidence of breast cancer.

Breast cancer risk was not increased in women presenting with breast pain.

Most patients with breast pain are exposed to imaging methods to exclude the cancer suspicion. However, breast imaging for any type of breast pain can help determine if there is a underlying and curable cause.

Since all patients with cancer in the mastalgia group are non-cyclic and most of them are postmenopausal, we have to conclude that patients with this characteristic should be investigated better.

References

1. Expert Panel on Breast Imaging, Jokich PM, Bailey L, D'Orsi C, Green ED, et al. (2017) ACR appropriateness criteria® breast pain. J Am Coll Radiol 14: S25-S33.

2. Griffith C, Dowle C, Hinton C, Blamey RW (1987) The breast pain clinic: A rational approachto classification and treatment of breast pain. Postgrad Med J 63: 547-549.

3. Morrow M (2000) The evaluation of common breast problems. Am Fam Physician 61: 2371-2378.

4. Tumyan L, Hoyt AC, Bassett LW (2005) Negative predictive value of sonography and mammography in patients with focal breast pain. Breast J 11: 333-337.

5. Duijm LE, Guit GL, Hendriks JH, Zaat JO, Mali WP (1998) Value of breast imaging in women with painful breasts: Observational follow up study. BMJ 317: 1492-1495.

6. Preece PE, Baum M, Mansel RE, Webster DJ, Fortt RW, et al. (1982) Importance of mastalgia in operable breast cancer. Br Med J (Clin Res Ed) 284: 1299-1300.

7. Morrow M (1991) Management of common breast disorders: Breast pain. In: Harris JR, et al. Breast diseases. (2nd edn), Philadelphia, Lippincott, 63-71.

8. Ader DN, Browne MW (1997) Prevalence and impact of cyclic mastalgia in a United States clinic-based sample. Am J Obstet Gynecol 177: 126-132.

9. Onstad M, Stuckey A (2013) Benign breast disorders. Obstet Gynecol Clin North Am 40: 459-473.

10. Ader DN, Shriver CD, Browne MW (1999) Cyclical mastalgia: Premenstrual syndrome or recurrent pain disorder? J Psychosom Obstet Gynaecol 20: 198-202.

11. Goodwin PJ, DeBoer G, Clark RM, Catton P, Redwood S, et al. (1995) Cyclical mastopathy and premenopausal breast cancer risk. Results of a case-control study. Breast Cancer Res Treat 33: 63-73.

12. Plu-Bureau G, Thalabard JC, Sitruk-Ware R, Asselain B, Mauvais-Jarvis P (1992) Cyclical mastalgia as a marker of breast cancer susceptibility: Results of a case-control study among French women. Br J Cancer 65: 945-949.

13. Smith RL, Pruthi S, Fitzpatrick LA (2004) Evaluation and management of breast pain. Mayo Clin Proc 79: 353-372.

14. Expert Panel on Breast Imaging, Mainiero MB, Moy L, Baron P, Didwania AD, et al. (2017) ACR appropriateness criteria® breast cancer screening. J Am Coll Radiol 14: S383-S390.

15. Gateley CA, Mansel RE (1990) Management of cyclical breast pain. Br J Hosp Med 43: 330-332.

16. Steinbrunn BS, Zera RT, Rodriguez JL (1997) Mastalgia. Tailoring treatment to type of breast pain. Postgrad Med 102: 183-184.

17. Leddy R, Irshad A, Zerwas E, Mayes N, Armeson K, et al. (2013) Role of breast ultrasound and mammography in evaluating patients presenting with focal breast pain in the absence of a palpable lump. Breast J 19: 582-589.

18. Aiello EJ, Buist DS, White E, Seger D, Taplin SH (2004) Rate of breast cancer diagnoses among postmenopausal women with self-reported breast symptoms. J Am Board Fam Pract 17: 408-415.

19. Plu-Bureau G, Le MG, Sitruk-Ware R, Thalabard JC (2006) Cyclical mastalgia and breast cancer risk: Results of a French cohort study. Cancer Epidemiol Biomarkers Prev 15: 1229-1231.

20. Smallwood JA, Kye DA, Taylor I (1986) Mastalgia; is this commonly associated with operable breast cancer? Ann R Coll Surg Engl 68: 262-263.

21. Khan SA, Apkarian AV (2002) Mastalgia and breast cancer: A protective association? Cancer Detect Prev 26: 192-196.

22. Howard MB, Battaglia T, Prout M, Freund K (2012) The effect of imaging on the clinical management of breast pain. J Gen Intern Med 27: 817-824.

23. American College of Radiology. ACR Practice Guideline for the Performance of Screening and Diagnostic Mammography.

24. Loving VA, DeMartini WB, Eby PR, Gutierrez RL, Peacock S, et al. (2010) Targeted ultrasound in women younger than 30 years with focal breast signs or symptoms: Outcomes analyses and management implications. AJR Am J Roentgenol 195: 1472-1477.

25. Leung JW, Kornguth PJ, Gotway MB (2002) Utility of targeted sonography in the evaluation of focal breast pain. J Ultrasound Med 21: 521-529.