



FACTORS CAUSING MASTALGIA – A MULTI-CENTRE EXPERIENCE: AN OBSERVATIONAL STUDY

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ABSTRACT

Mastalgia is one of the commonest problem faced by a female during the lifetime. Females present with complaints of mastalgia to the medical practitioner because of increased awareness of breast cancer and also the fear factor associated with it, most of the females undergo multiple investigations to rule out malignancy mainly because of fear of malignancy. Breast cancer is one of the most common type of malignancy occurring in the females worldwide. The aim and objective of study is to determine the associated factors that may be correlated with mastalgia. Mastalgia is a common symptom among women that causes anxiety and burdens over healthcare facilities. Reassurance and non-pharmacological measures should be the first choice of treatment when Painful. This study revealed that breast pain is common in women at 15-35 years and BMI over 28, weight gain, No Lactation and using faulty bra are risk factors for mastalgia. Treatment should be simple lifestyle changes but more controlled studies and findings should be evaluated again based on objective data in a different societies.

KEYWORDS : Mastalgia, Breast pain, Cyclical mastalgia

INTRODUCTION :

Mastalgia is one of the commonest problem faced by a female during the lifetime [1,2]. Females present with complaints of mastalgia to the medical practitioner because of increased awareness of breast cancer and also the fear factor associated with it, most of the females undergo multiple investigations to rule out malignancy mainly because of fear of malignancy[3]. Breast cancer is one of the most common type of malignancy occurring in the females worldwide[4]. In India breast cancer second to cancer cervix. Mastalgias sometimes also referred to as mastodynia. It may affect up to two-thirds of patients during their lifetime during the reproductive period. Mastalgia can be classified into cyclical and non-cyclical mastalgia. Cyclical mastalgia is the pain felt in the breast during the later phase of the menstrual cycle i.e. luteal phase because of the fluid retention property of progesterone which leads to mastalgia[6], it is usually bilateral, diffuse, poorly localized, and generally described as a heaviness or soreness that often radiates to the axillae and arms, and it usually has a chronic course. Noncyclic pain is not related to the menstrual cycle, and may be unilateral. It is usually described as a sharp, burning pain that appears to be localized in the breast [7]. Mastalgia i.e noncyclic is most common in women of the age of 40–50 years [3].

Mastalgia condition is commonly due to benign causes, but breast malignancy should be excluded because it is the main concern in the majority of women, although it could be associated with premenstrual syndrome, anxiety disorders. Extramammary pain sources needs to be also excluded like especially Tietze syndrome, musculoskeletal pain or referred pain [1–4].

Mastalgia can be severely crippling affecting the daily activities and also affecting the family and sexual life of a female or it can be a chronic dull pain, it may cause to have a major impact on the mode and the work activities [4].

Mastalgia has been linked to multiple factors like stress, anxiety, depression, myalgia, irritable bowel syndrome, chronic pelvic pain and psychosomatic disorders. Most Publishers agree that mastalgia has multifactorial pathogenesis [4,5].

Mastalgia can be associated with a premenstrual syndrome, which may involve breast pain only or may be a state of generalized body pain and sensation of tension. In rare presentation breast cancer can also present as mastalgia but the presentation is very rare, it usually presents as breast lump/ mass which is rapidly increasing in size. The most important step after exclusion of breast cancer as a cause of mastalgia is reassurance. [2,8,9].

Patient with mastalgia need to be assessed fully, including complete personal and family history, breast and general examinations, and the patient may need some investigations such as breast imaging and some of the hormonal assessments [7].

Increased estrogen, increased prolactin, decreased progesterone levels, or alterations in the estrogen/ progesterone ratio are theories regarding the pathophysiology of mastalgia [8]. Menstrual irregularity, oral contraceptives, hormone therapy, psychotropic drugs, some cardiovascular agents (i.e. spironolactone, digoxin), psychosocial factors, and emotional stress are related with breast pain [3, 9]. Large, pendulous breasts may create ligamentous pain [6]. Caffeine and nicotine consumption are also considered to be related with mastalgia [2]. Our aim was to investigate the factors in patient history that affect the incidence of chest/breast pain.

Aim and objectives: To determine the associated factors that may be correlated with mastalgia.

MATERIAL AND METHODS

Study design and patients

This is a retrospective study that was done in the Dr Ram Manohar Lohia Institute of Medical sciences, Lucknow and Prasad Institute of medical sciences & Hospital, Lucknow in Department of surgery opd of the female patients who visited in the period between June 2018 and March 2020

Inclusions and exclusion criteria

All patients who presented to the surgical clinic with complaints of mastalgia were included in this study

Diagnosis and measures

Patients presented with mastalgia included in the study,

detailed information were taken from, and data recorded using a specially de- signed questionnaire. Patients underwent breast examination to detect the site of tenderness, lump or lumpiness, any associated nipple re- traction or pain. Some patients were evaluated using various imaging modalities such as ultrasound, mammography, and MRI of the breast.

Statistical Analysis :

The results were analyzed using descriptive statistics and making comparisons among the various groups. Categorical data was represented in proportion and percentages. chi square test of proportion was used to test the equality of proportion of various categories within a factor.

95% Upper and lower confidence limit method was used to check unusual risk factors among the expected risk factors for mastalgia.

The data was analyzed by using MS-Excel and the statistical package for social sciences (SPSS 21.0) software.

In testing the given hypotheses the level of significance was taken as p<0.05.

RESULTS:

1120 patients data was retrospectively studied and factors causing mastalgia were evaluated

Table 1. Distribution of Demographic Factors among Mastalgia Cases

FACTORS	CATEGORY	No.	%	95% LCL	95% UCL	chi sq	p-value
AGE(YRS)	15-24	410	36.60%	33.78%	39.42%	546.04	<0.001
	25-34	390	34.82%	32.03%	37.61%		
	35-44	201	17.94%	15.69%	20.19%		
	45-54	112	10%	8.24%	11.76%		
	Above 55	7	0.62%	0.16%	1.08%		
BMI	<28 kg/m ²	460	41%	38.12%	43.88%	35.71	<0.001
	>28 kg/m ²	660	59%	56.12%	61.88%		
MARITAL STATUS	UNMARRIED	694	61.96%	59.12%	64.80%	64.13	<0.001
	MARRIED	426	38.03%	35.19%	40.87%		

According to the demographic profile of mastalgia cases, the age group of above 55 years was relatively less prevalent and the difference in proportion of various age groups was found to be significant (p<0.001)

The BMI > 28 kg/m² was relatively more prevalent than BMI < 28 kg/m² and the difference in proportion of two BMI's was found to be significant (p<0.001)

The unmarried were relatively more prevalent than married and the difference in their proportions was found to be significant (p<0.001)

Table 2. Distribution of External Factors among Mastalgia Cases

FACTORS	CATEGORY	No.	%	95% LCL	95% UCL	chi sq	p-value
STRESS	NONE	224	20%	17.66%	22.34%	403.2	<0.001
	STRESSFUL	896	80%	77.66%	82.34%		

CAFFEINE	NONE	728	65%	62.21%	67.79%	525.33	<0.001
	1 cup/day	135	12%	10.10%	13.90%		
	>2 cup/day	257	13%	11.03%	14.97%		
SMOKING	NONE	820	73.21%	70.62%	75.80%	241.43	<0.001
	>5/DAY	300	26.78%	24.19%	29.37%		
LACTATION	0	550	49.10%	46.17%	52.03%	133.97	<0.001
	1	325	29.01%	26.35%	31.67%		
	>2	245	21.87%	19.45%	24.29%		
SALT USE	NORMAL	806	72%	69.37%	74.63%	216.13	<0.001
	EXCESS	314	28%	25.37%	30.63%		
FAULTY BRA SIZE	NO	650	58%	55.11%	60.89%	28.93	<0.001
	YES	470	42%	39.11%	44.89%		

According to the external factors of mastalgia cases, the cases having stress were more prevalent than non-stress cases and the difference in their proportions was found to be significant (p<0.001)

The cases of caffeine users were less prevalent than non-user cases and the difference in their proportions was found to be significant (p<0.001)

The smokers were less prevalent than non-smokers and the difference in their proportions was found to be significant (p<0.001)

The smokers non-lactation cases were more prevalent than lactation user groups and the difference in their proportions was found to be significant (p<0.001)

The faulty bra size was observed in 42% cases.

Table 3. Distribution of Clinical Factors among Mastalgia Cases

FACTORS	CATEGORY	No.	%	95% LCL	95% UCL	chi sq	p-value
H/O OCP	NO	996	89%	87.17%	90.83%	678.91	<0.001
	YES	124	11%	9.17%	12.83%		
F/H/O MASTALGIA	NO	695	62%	59.16%	64.84%	65.09	<0.001
	YES	425	38%	35.16%	40.84%		
CYCLICAL MASTALGIA	NO	750	67%	64.25%	69.75%	128.93	<0.001
	YES	370	33%	30.25%	35.75%		
H/O BREAST TRAUMA	NO	1042	93%	91.51%	94.49%	829.73	<0.001
	YES	78	7%	5.51%	8.49%		
MENSTRUAL HISTORY	PRE-MENOPAUSE	990	88.40%	86.52%	90.28%	660.36	<0.001
	POST-MENOPAUSE	130	11.60%	9.72%	13.48%		
F/H/BREAST CANCER	NO	1064	95%	93.72%	96.28%	907.2	<0.001
	YES	56	5%	3.72%	6.28%		

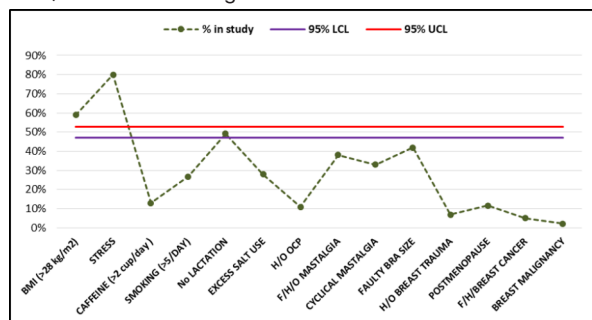
BREAST MALIGNANCY	NO	109	98%	96.9	98.6	102	<0.001
	YES	25	2%	1.37%	3.10%	2.2	

Among the mastalgia cases, among the various clinical risk factors, H/O Mastalgia was the most prevalent (38%) followed by the Cyclical mastalgia (33%).

Table 4. Association of Selected Risk Factors with Mastalgia Cases

FACTORS	% in study	95% LCL	95% UCL
BMI (>28 kg/m ²)	59%	47%	53%
STRESS	80%	47%	53%
CAFFEINE (>2 cup/day)	13%	47%	53%
SMOKING (>5/DAY)	26.78%	47%	53%
No LACTATION	49.10%	47%	53%
EXCESS SALT USE	28%	47%	53%
H/O OCP	11%	47%	53%
F/H/O MASTALGIA	38%	47%	53%
CYCLICAL MASTALGIA	33%	47%	53%
FAULTY BRA SIZE	42%	47%	53%
H/O BREAST TRAUMA	7%	47%	53%
POSTMENOPAUSE	11.60%	47%	53%
F/H/BREAST CANCER	5%	47%	53%
BREAST MALIGNANCY	2%	47%	53%

According to the prevalence of various risk factors among mastalgia cases and considering 50% prevalence as average level, it was found that the prevalence of BMI (>28 kg/m²) and Stress is lying above the 95% UCL (Upper confidence limit) it mean their presence in mastalgia cases was high and so they can be significant risk factors. The factor No lactation is lying between LCL and UCL, so can become an average risk factor while other factors were lying below LCL (lower confidence limit) and so have no significance.



DISCUSSION:

Mastalgia is a disorder which is poorly understood, under-recognised and not be appropriately diagnosed unless patients are properly evaluated for breast pain. In last decades increase women awareness level, care related to their health and better medical education and facilities increases the ability to identify breast pain through more and mor information. In our study, about 800 patient out of 1120 (~71.42%) has onset of mastalgia between 15-35 years with 36.60% (410) having onset of pain between 15-24 and 34.82% (390) between age of 25-34 years and negligible number (0.62%) of the patients had onset after 55 years.

The BMI > 28 kg/m² was relatively more prevalent than BMI < 28 kg/m² and the difference in proportion of two BMI's was found to be significant (p<0.001), so BMI greater than 28 and more weight gain are identified as risk factor in our study and we found that weight management is better approach in the prevention of mastalgia and also considered that BMI >28, experiences breast pain two times than BMI <28, hence concluded that obesity within normal range (weight loss) can be important factor in the prevention of mastalgia. So in our study obesity is identified as a important risk factor[7].

According to the external factors of mastalgia cases, the cases having stress were more prevalent than non-stress cases and the difference in their proportions was found to be significant (p<0.001), So level of worry and anxiety in womens, who suffer from mastalgia and were not identified to have any pathology in radiological and physical examination, could be very high (80%). Ader et al. [2] showed a relationship between increased stress and mastalgia, and Preece et al. [10] reported that mastalgia was a manifestation of psychoneurosis. Women who have taken psychiatry consultation for anxiety related to stress/depression, got some relieved from mastalgia compared to women who have not taken psychiatric consultation. Some study shown that anxiety, depression and emotional abuse may related to breast pain [10,11,12].

The organic effect of smoking, tea consumption and caffeine intake on mastalgia is not known. People who smoke and excessively consume tea and coffee have a mastalgia risk that is 4-5 times more than in normal people and the definitive reason for this could not clearly be shown in various studies. The relationship of caffeine consumption and smoking with breast pain is controversial. In their series of 874 cases, Ader et al. reported that increased caffeine consumption and smoking were correlated with mastalgia[2]. In the present study, there was no significant relationship between either regular caffeine consumption or heavy smoking (> 5 cigarettes/day) and breast pain.

Considering lactation, the percentage of women with a history of breast feeding 3 or more infants was increased in the mastalgia group (p < 0.01). These results highlight the correlation of mastalgia with the increased incidences of lactation, which is associated with increased number of births, and thus with increased exposure to the effects of high estrogen and prolactin levels. Additionally, 3 or more periods of lactation may result with anatomical changes in the breast tissue, especially in the ductal system, such as ductal ectasia, which may also lead to mastalgia [13,14].

It has been reported that excessive salt consumption causes edema in the breast tissue of women with periodic mastalgia, which on the other hand, increases the pain. Thus it has been suggested that salt consumption should be decreased before the menstruation in order to prevent mastalgia. However, in our study, no significant correlation was found between excessive salt consumption and mastalgia[15].

While some studies of low-dose Oral Contraceptives (20 ug ethinyl estradiol) have found no increased breast symptoms compared with placebo. Others have shown that many women reported a reduction in severity and duration of cyclic breast discomfort and PMS while taking OCPs[2]. A multicenter casecontrol study was performed on women receiving medroxyprogesterone acetate (Depo-Provera) for contraception compared with age matched controls. In our study, no significant correlation was found between H/O OCPs and mastalgia[16,17].

The use of bras for women comes to the forefront of aesthetic concerns, as opposed to health benefits. In this study, using large or small bras are identified as risk factors. Especially women who use a bra smaller in size experienced mastalgia 3.260 times more compared to those who used the appropriate size. Santer and Mansel stated the pressure of a smaller bra is among one of the etiologies of mastalgia[18]. Wood et al. found a minor relation between small bras and the severity of pain[19]. The use of large bras might also be risk factor due to not securing the shape of breast against the force of gravity. For women marathon runners, among the other factors, bras hold an important place in the increase of mastalgia risk. Using a proper supportive bra may have an important role in

the prevention of or reduction of Mastalgia[20]. It is indicated that mastalgia due to macromastia may be prevented, particularly with large breasts.

However, studies suggest that a great majority of women (80–90%) are not using an appropriate bra. In contrast, considering the widespread use of bras among women, we can predict that there is a high possibility of problems that women may face due to not using the correct size bras. For this reason, the size and manner of wearing bras should be evaluated in each and every woman experiencing mastalgia.

Roughly 2/3rds of breast pain is cyclic and 1 third noncyclic [21]. In a study including 1,150 patients that investigated the causes of mastalgia, the rates of cyclic and noncyclic mastalgia were found to be 61.5% and 38.5%, respectively [22]. In the mastalgia group of the present study, the rates of cyclic and noncyclic mastalgia were 67%, and 33%, respectively. Most of women with breast discomfort suffer cyclical mastalgia which severity can be determined by advanced age, age of marriage, history of abortion and history of PMS.

Mastalgia may occur due to fatty tissue necrosis, or a strain in the Cooper ligaments as results of either blunt or penetrating trauma to the breast [23]. In our study, although the presence of a recent history of direct trauma to the breast showed no significant difference between the groups, higher rates of trauma history in the mastalgia group was remarkable.

In their study of 1,219 patients, Johnson et al. found that the majority of their asymptomatic patients were postmenopausal. Other studies have also reported a significant relationship between the asymptomatic group and postmenopausal state [24,25]. In our study, no significant correlation was found between postmenopausal and mastalgia.

There may be an association between mastalgia and the subsequent development of breast cancer, but the nature of the relationship is not clear based on current evidence. Some researchers have questioned whether breast pain is truly related to cancer or whether this pain prompts an evaluation in which an otherwise asymptomatic cancer is identified [26]. It is very rare to have mastalgia as the only symptom of breast cancer, though breast pain has been reported along with other symptoms of breast cancer in the range of 5% to 18% of cases of breast cancers. Cochrane et al. conducted a retrospective study of 2332 new patients attending a breast clinic in South Wales and found that only 1 cancer presented with mastalgia alone [27]. Khan and Apkarian studied the association between mastalgia and breast cancer by analysing data for 5463 women who attended the Breast Care Center of University Hospital, Syracuse, New York, and after making adjustments for various risk factors (early menarche, late first birth, late menopause, exogenous hormone use, and positive family history), it was found that women who experienced pain were less likely to be diagnosed with breast cancer [28]. Conversely, a study by Preece et al. found that 36 of 240 women with newly diagnosed breast cancer had localized breast pain as a presenting symptom. Of these, 10 women (28%) had normal mammographic findings and were later diagnosed as having subclinical breast cancer at the site of pain after further evaluation [29]. Therefore, cancer must be seriously considered as a differential diagnosis in patients presenting with well-localized breast pain. These patients should be followed up on for at least 1 year after the onset of the pain before cancer is confidently excluded [29,30].

CONCLUSIONS :

Mastalgia is a common symptom among women that causes anxiety and burdens over healthcare facilities. Reassurance and non-pharmacological measures should be the first choice

of treatment when Painful. This study revealed that breast pain is common in women at 15-35 years and BMI over 28, weight gain, No Lactation and using faulty bra are risk factors for mastalgia. Treatment should be simple lifestyle changes but more controlled studies and findings should be evaluated again based on objective data in a different societies.

NOTE : No Conflict -of -interest

REFERENCES :

1. Preece PE, Baum M, Mansel RE, et al. Importance of mastalgia in operable breast cancer. *Br Med J (Clin Res Ed)* 1982;284:1299–1300. [PMC free article] [PubMed] [Google Scholar]
2. Ader DN, South-Paul J, Adera T, et al. Cyclical mastalgia: Prevalence and associated health and behavioral factors. *J Psychosom Obstet Gynaecol.* 2001;22:71–76. [PubMed] [Google Scholar]
3. Morrow M. The evaluation of common breast problems. *Am Fam Physician.* 2000;61:2371–2378. [PubMed] [Google Scholar]
4. Johnson KM, Bradley KA, Bush K, Gardella C, Dobie DJ, Laya MB. Frequency of mastalgia among women veterans. Association with psychiatric conditions and unexplained pain syndromes. *J Gen Intern Med.* 2006;21(3):S70–5. doi: 10.1111/j.1525-1497.2006.00378.x. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
5. A. Olawaiye, et al. **Mastalgia: a review of management** *J. Reprod. Med.,* 50 (12) (2005), pp. 933-939 [View Record in ScopusGoogle] [Scholar]
6. Smith RL, Pruthi S, Fitzpatrick LA. Evaluation and management of breast pain. *Mayo Clin Proc.* 2004;79:353–372. [PubMed] [Google Scholar]
7. Salzman B, Fleege S, Tully AS. Common breast problems. *Am FamPhysician.* 2012;86:343–349. [PubMed] [Google Scholar]
8. Arias RD, Macdonald HR. Benign breast disease. *Clinical Updates in Women's Health Care.* 2015;14(3)
9. A. A. Mohammed **Quantitative assessment of Ki67 expression in correlation with various breast cancer characteristics and survival rate; cross sectional study** *Ann. Med. Surg.,* 48 (2019), pp. 129-134 ArticleDownload PDFView Record in ScopusGoogle Scholar
10. Preece PE, Mansel RE, Hughes LE: Mastalgia: Psychoneurosis or organic disease? *Br Med J* 1978; 1: 29–30.
11. Jenkins PL, Januil N, Gateley C, et al.: Psychiatric illness in patients with severe treatment-resistant mastalgia. *Gen Hosp Psychiatry* 1993; 15: 55–57.
12. Colegrave S, Holcombe C, Salmon P: Psychological characteristics of women presenting with breast pain. *J Psychosom Res* 2001; 50: 303–307
13. Wang DY, Fentiman IS: Epidemiology and endocrinology of benign breast disease. *Breast Cancer Res Treat* 1985; 6: 5–36. <https://doi.org/10.1007/bf01806008>
14. Wisbey JR, Kumar S, Mansel RE, et al.: Natural history of breast pain. *Lancet* 1983; 2: 672–674.
15. Dimagno MM, Harrison VR, Newman LA, Parker-Featherstone EC, Pearlman AM, Helvie MA, Guidelines for clinical care: Common breast problems, University of Michigan Health system. Available at: <http://www.med.umich.edu/linfo/fhp/practiceguides/breast/breast.pdf>. Accessed Aug 3, 2017
16. Rohan TE, Miller AB. A cohort study of oral contraceptive use and risk of benign breast disease. *Int J Cancer.* 1999; 19; 82(2):191-196.
17. Vessey M, Yeates D. Oral contraceptives and benign breast disease: an update of findings in a large cohort study. *Contraception.* 2007; 76(6): 418-424
18. Santen RJ, Mansel R. Benign breast disorders. *N Engl J Med* 2005;353(3):275–85.
19. Wood K, Cameron M, Fitzgerald K. Breast size, bra fit and thoracic pain in young women: a correlational study. *Chiropr Osteopat* 2008;16:1.
20. Hadi MS. Sports Brassiere: Is It a Solution for Mastalgia? *Breast J* 2000;6:407-9
21. Goyal A, Mansel RE: Mastalgia; in Jatoi I, Kaufmann M (eds): Management of breast disease. Springer-Verlag, Berlin, 2010, pp. 69–76.
22. Kizilkaya MC, Erozyen F, Kocakusak A, et al.: Mastalgia in daily practice. *J Breast Health* 2013; 9: 191–194
23. Santen RJ, Mansel R: Benign breast disorders. *N Engl J Med* 2005; 353: 275–285.
24. Tavaf-Motamen H, Ader DN, Browne MW, et al.: Clinical evaluation of mastalgia. *Arch Surg* 1998; 133: 211–214.
25. Plu-Bureau G, Le MG, Sitruk-Ware R, et al.: Cyclical mastalgia and breast cancer risk: Results of a French cohort study. *Cancer Epidemiol Biomarkers Prev* 2006; 15: 1229–1231.
26. Morrow M. The evaluation of common breast problems. *Am Fam Physician.* 2000 Apr 15;61(8):2371-8, 2385
27. Cochrane RA, Singhal H, Monypenny JJ, Webster DJT, Lyons K, Mansel RE. Evaluation of general practitioner referrals to a specialist breast clinic according to the UK national guidelines. *Eur J Surg Oncol.* 1997 Jun;23(3):198-201. doi: 10.1016/S0748-7983(97)922204.
28. Khan SA, Apkarian AV. Mastalgia and breast cancer: a protective association? *Cancer Detect Prev.* 2002;26(3):192-6. doi: 10.1016/S0361-090X(02)00065-X.
29. Preece PE, Baum M, Mansel RE, Webster DJ, Fortt RW, Gravelle IH, et al. Importance of mastalgia in operable breast cancer. *Br Med J (Clin Res Ed).* 1982 May 1;284(6325):1299-300. doi: bmj.284.6325.1299.
30. Fariselli G, Lepera P, Viganotti G, Martelli G, Bandieramonte G, Di Pietro S. Localized mastalgia as presenting symptom in breast cancer. *Eur J Surg Oncol.* 1988 Jun;14(3):213-5.