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Evaluation of breast pain in women with mammography and ultrasound

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Abstract

Background and Purpose: Breast pain is one of the most common symptoms experienced by women and a frequent reason of health care including imaging. The purpose of the present study was to evaluate the breast pain with mammography and ultrasound, cause of the breast pain in women.

Methodology: The study reviewed 30 numbers of articles. Google Scholars and pubmed were searched for the relevant studies. Data was taken according to the age/sex, symptoms, menopausal status, clinical history and imaging modalities.

Result: This review article provide the information about risk of malignancy with breast pain depend upon the type of mastalgia. Patients with non-cyclic pain showed high severity of malignancy. There is no risk of cancer in patients presenting with pain. The negative predictive value of both the mammography and ultrasound with breast pain was 100% or around it.

Conclusion: Breast imaging can help to determine the cause of breast pain if there is an underlying and operable cause. Ultrasound and mammography should be done on the basis of age of the patient. The accuracy of mammogram increased in women with less dense and fattier breast and in younger patient ultrasound appear superior to mammogram. Imaging modalities can reassure the patients that they do not have any pathological findings and the severity of pain and anxiety decreased after ultrasound.

Keywords: mammography and ultrasound, breast pain, women

Introduction

Breast imaging is an important tool to investigate the causes of breast diseases. Breast pain is most commonly experienced symptom in women. (1) Breast pain is also known as “mastalgia”. The rate of premenopausal and postmenopausal women who experienced breast pain in their lives is between 50% and 80%. (2) Breast pain is classified into two types are cyclic mastalgia and non-cyclic mastalgia. (3) Cyclic mastalgia occurs 1 to 2 weeks before the onset of menstrual. Cyclic mastalgia is bilateral and it can be more severe on one side. The resolution of the cyclic mastalgia is influenced by the hormonal event such as pregnancy or menopause. (4)

Non-cyclic pain is not related to menstrual cycle. Pain is generally unilateral and well localized. It can resolve without treatment or it can also be challenging to treat. Non-cyclic pain may occur due to the mastitis, cysts, fat necrosis and neoplasis. (5)

The psychological reason of breast pain is not fully enlightened and it was secure that cause of the breast pain could be hormonal reason. (6) Breast cancer is the heterogeneous disease which has no identical cause. Early detection is the key to preventing breast cancers from spreading. Mammography and ultrasound are most commonly imaging techniques for the evaluation of breast disease. Women who present with breast symptoms or any palpable findings are evaluated with mammography or breast ultrasound or both. The choice of the breast imaging in women with symptom is based on age. Presence of evidence also has an important role with age. If little evidence exists in symptomatic women, it describes the choice of breast imaging. In the absence of evidence, women younger than 35 years examined with ultrasound and women older than 35 examined with mammography. (7) The aim of the study is to evaluate the breast pain in women with mammography and ultrasound.

Methods

Two databases Google Scholar and Pubmed were searched for relevant studies. Data was taken on the basis of age/ sex, symptoms of breast diseases, menopausal status, clinical history and imaging modalities. 30 numbers of articles was taken for this study.

All considered study designs were (e.g. prospective study, retrospective and cross- sectional study, etc). Inclusion criteria were all the patients with symptoms including breast pain.

Result

Malignancy presenting with pain

Out of 30 studies, few studies show severity of malignancy depends upon the type of mastalgia and the rate of non-cyclic pain is high. In one of the study, 104 patients were included and their average age was 38.6. 38.5% had cyclic pain, 57.7% had non-cyclic pain and 3.8% had other type of pain. According to BIRADS category, patients who appeared with BIRADS 5 mass lesions had severe and non-cyclic pain in post-menopausal period and in another study

16% cyclic pain and 84% non-cyclic pain were present in 3157 patients with their mean age of 43.8 ±11.8. (Graph 1)
But in some studies, non-cyclic pain had no association of malignancy. In a study, 200 women included with a complaint of cyclic or non-cyclic breast pain. Ultrasound imaging was normal in all the patients. No suspicious lesions were found in imaging. All the patients appeared with either BIRADS 1 or BIRADS 2.
Other two studies show that the fibrocystic changes were the most common cause of breast pain.

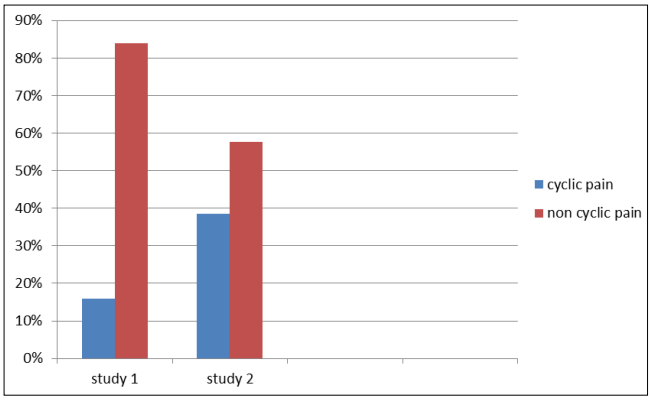

Fig 1: rate of mastalgia

Mastalgia- cancer relationship
Out of mentioned 30 studies 5 studies showed that pain is not the frequent symptom of breast cancer. Of these 2 studies showed that the rate of malignancy in patient with pain did not differ. A study was performed with 436 symptomatic patients. Of these 12 cancers were accurately detected on mammography and 4/12 cancers appeared with pain. Breast pain is the major cause of the breast cancer is usually detected on mammography. In unilateral asymptomatic breast, ipsilateral breast pain associated with breast cancer. In one of the study 1884 patients were evaluated with mastalgia and routine screening group. In both the group five patients found with breast cancer. All five have non-cyclic pain in mastalgia group.
In two studies related to focal breast pain, patients were examined in modalities mammography alone, ultrasound alone or both ultrasound and mammography. On follow up breast cancer were diagnosed at site of breast pain.

Imaging modalities in evaluating breast pain
Four studies performed with both the ultrasound and mammography for evaluating the breast pain. Two studies showed that the negative predictive value of ultrasound and mammography in patients with focal breast pain in the absence of breast mass or lump was 100% and a another study show that efficiency of ultrasound (99.3%) is higher than efficiency of mammography (84.2%) to detect fibrocystic changes in patients with most common symptom was pain. In one of the studies, 470 patients were referred with diffuse and focal breast pain underwent into imaging from which 105 patients had pain alone and 76 patients had pain unilateral. The study shows that negative predictive value of both the examination was 95.7%.
Two study showed that the ultrasound detected more relevant mass lesion that missed by mammography in symptomatic women with dense breast and ultrasound is not necessary in a negative mammogram with a clinical symptom of breast pain had no malignancy without dense breast.

Discussion
Breast pain is the most common symptom that affects the quality of life. The risk of the malignancy in patients with complaint of breast pain is very low. (8) In a study, breast imaging should be customized to the age of the patient, risk for breast cancer and other aspect of clinical presentation. Sonography is selected as the diagnostic modality in younger women because of the higher risk of the radiation, low prevalence of breast cancer and the dense breast in young women. (9) Mammogram should be considered in women who aged 30 years or older and have a family history of breast cancer or risk for cancer. One of the study showed improvement in sensitivity of mammography has been shown in women 60 years or older relative to younger women. In women 45 years or younger, ultrasound has a greater sensitivity than mammography. The difference in the sensitivity and specificity of two imaging test is statistically remarkable. Ultrasound has greater specificity than mammography. (7) One study performed with mammography and sonography with diffuse and focal breast pain to determine the negative predictive value. 55 patients were available after complete follow up. Out of 55, 4 patients were subjected to mammographic ally guided breast biopsy. The studies showed that if imaging findings are not suspicious as cancer then biopsy might not be indicated delayed and if finding are suspicious, biopsy should not be delayed. (10)
In breast feeding patients, breast pain is one of the most common complaints and it may be due to the other causes including engorgement, milk stasis, and vasospasm of the nipple, trauma, and mastitis. (11) Solid masses in breast are the cause of breast pain. Benign solid mass presented with pain growing fibroadenomas, infaction in fibroadenomas or tumors. Isolated breast pain is associated with cancer in less than 1% of cases. (12) (13) Breast pain is caused by Benign breast disorder. (14)
Another study performed with mastalgia, the long term follow up confirms the nature of severe cyclic and non-cyclic mastalgia in women with pain for last 5 years. The nature of the pain may change with time. Resolution of cyclic mastalgia associated with hormonal event and resolve with menopause. (15)
In some studies, a closer relationship of mastalgia and anxiety in mastalgia patients were found to be most common and intense stress, daily coffee, chocolate consumption, breast surgery history, were the risk factor associated with pain. (16) (17) A study was performed to evaluate the intensity of pain and anxiety in patients with breast pain and by normal examination. The study shows the severity of pain and anxiety decreased after ultrasound. Ultrasound finding reassure the patients. (18)

Conclusion
The cause of the breast pain are benign, breast pain can significantly impact quality of life. There is no incidence of cancer in patients with breast pain. Breast imaging can help to determine the cause of breast pain if there is an underlying and operable cause. Ultrasound and mammography should be done on the basis of age of patient. The accuracy of mammogram increased in women with less dense and fattier breast. In younger patient

ultrasound appear superior to mammogram. Imaging modalities can reassure the patient that they do not have any pathological finding. The severity of pain and anxiety decreased after ultrasound. If findings are suspicious as cancer in mastalgia patients then biopsy should not be delayed.

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References

1. Cornell LF, Sandhu NP, Pruthi S, Mussallem DM. Current management and treatment options for breast pain. Mayo Clin Proc [Internet],2020:95(3):574-80. Available from: http://dx.doi.org/10.1016/j.mayocp.2019.12.014
2. Kanat BH, Atmaca M, Girgin M, Ilhan YS, Bozdağ A, Özkan Z *et al*. Effects of mastalgia in young women on quality of life, depression, and anxiety levels. Indian J Surg [Internet],2016:78(2):96-9. Available from: http://dx.doi.org/10.1007/s12262-015-1325-5
3. Yılmaz EM, Çelik S, Arslan H, Değer D. Relation between mastalgia and anxiety in a region with high frequency of posttraumatic stress disorder. J Breast Health [Internet],2015:11(2):72-5. Available from: http://dx.doi.org/10.5152/tjbh.2015.2363
4. Salati SA, Alhumaid AA. Mastalgia: A narrative literature review of current understanding and management. East Cent Afr J Surg [Internet]. 2018;23(1):42. Available from: http://dx.doi.org/10.4314/ecajs.v23i1.9
5. Kataria K, Dhar A, Srivastava A, Kumar S, Goyal A. A systematic review of current understanding and management of mastalgia. Indian J Surg [Internet]. 2014;76(3):217–22. Available from: http://dx.doi.org/10.1007/s12262-013-0813-8
6. Colegrave S, Holcombe C, Salmon P. Psychological characteristics of women presenting with breast pain. J Psychosom Res [Internet],2001:50(6):303-7. Available from: http://dx.doi.org/10.1016/s0022-3999(01)00196-9
7. Devolli-Disha E, Manxhuka-Kërliu S, Ymeri H, Kutllovci A. Comparative accuracy of mammography and ultrasound in women with breast symptoms according to age and breast density. Bosn J Basic Med Sci [Internet],2009:9(2):131-6. Available from: http://dx.doi.org/10.17305/bjbms.2009.2832
8. Martín-Díaz M, Maes-Carballo M, Khan KS, Bueno-Cavanillas A. To image or not in noncyclic breast pain? A systematic review. Curr Opin Obstet Gynecol [Internet],2017:29(6):404-12. Available from: http://dx.doi.org/10.1097/GCO.0000000000000407
9. Ghebrehiwet M, Paulos E, Andeberhan T. The use of sonography and mammography in the evaluation of Eritrean women with breast pain. J Eritrean Med Assoc [Internet]m, 2010, 3(1). Available from: http://dx.doi.org/10.4314/jema.v3i1.49619
10. Masroor I, Afzal S, Sakhawat S, Khan N, Beg MA, Kawal D. Negative predictive value of mammography and sonography in mastalgia with negative physical findings. J Pak Med Assoc,2009:59(9):598-601.
11. Sivarajah R, Welkie J, Mack J, Casas RS, Paulishak M, Chetlen AL. A review of breast pain: Causes, imaging recommendations, and treatment. Journal of Breast Imaging [Internet],2020;2(2):101-11. Available from: http://dx.doi.org/10.1093/jbi/wbz082
12. Chetlen AL, Kapoor MM, Watts MR. Mastalgia: Imaging work-up appropriateness. Acad Radiol [Internet],2017:24(3):345-9. Available from: http://dx.doi.org/10.1016/j.acra.2016.10.004
13. Mohallem Fonseca M, Lamb LR, Verma R, Ogunkinle O, Seely JM. Breast pain and cancer: should we continue to work-up isolated breast pain? Breast Cancer Res Treat [Internet],2019:177(3):619-27. Available from: http://dx.doi.org/10.1007/s10549-019-05354-1
14. Mohammed AA. Evaluation of mastalgia in patients presented to the breast clinic in Duhok city, Iraq: Cross sectional study. Ann Med Surg (Lond) [Internet],2020:52:31-5. Available from: http://dx.doi.org/10.1016/j.amsu.2020.02.012
15. Davies EL, Gateley CA, Miers M, Mansel RE. The long-term course of mastalgia. J R Soc Med [Internet],1998:91(9):462-4. Available from: http://dx.doi.org/10.1177/014107689809100903
16. Katar MK, Başer M. Relationship between mastalgia and anxiety-depression: An observational study. Cureus [Internet],2021:13(1):e12734. Available from: http://dx.doi.org/10.7759/cureus.12734
17. Bolat H, Aşcı Ö, Kocaöz S, Kocaöz S. Noncyclical and cyclical mastalgia in Turkish women: Prevalans, risk factors, health-care seeking and quality of life. Health Care Women Int [Internet],2021, 1-16. Available from: http://dx.doi.org/10.1080/07399332.2021.1887194
18. Zarei F, Pishdad P, Hatami M, Zeinali-Rafsanjani B. Can breast ultrasound reduce patient's level of anxiety and pain? Ultrasound [Internet],2017:25(2):92-7. Available from: http://dx.doi.org/10.1177/1742271X17690021
19. Yıldırım AC, Yıldız P, Yıldız M, Kahramanca Ş, Kargıcı H. Mastalgia-cancer relationship: A prospective study. J Breast Health [Internet].2015:11(2):88-91. Available from: http://dx.doi.org/10.5152/tjbh.2015.2492
20. Ölçücüoğlu E, Yılmaz G. Mastodynia: is imaging necessary in young patients? Ulus Cerrahi Derg [Internet],2013:29(1):17-9. Available from: http://dx.doi.org/10.5152/UCD.2013.04
21. Duijm LE, Guit GL, Hendriks JH, Zaat JO, Mali WP. Value of breast imaging in women with painful breasts: observational follow up study. BMJ [Internet].199:317(7171):1492-5. Available from: http://dx.doi.org/10.1136/bmj.317.7171.1492
22. Leddy R, Irshad A, Zerwas E, Mayes N, Armeson K, Abid M *et al*. Role of breast ultrasound and mammography in evaluating patients presenting with focal breast pain in the absence of a palpable lump. Breast J [Internet],2013:19(6):582-9. Available from: http://dx.doi.org/10.1111/tbj.12178

23. Lumachi F, Ermani M, Brandes AA, Boccagni P, Polistina F, Basso SMM *et al*. Breast complaints and risk of breast cancer. Population-based study of 2,879 self-selected women and long-term follow-up. Biomed Pharmacother [Internet],2002:56(2):88-92. Available from: http://dx.doi.org/10.1016/s0753-3322(01)00160-3
24. Cho MW, Grimm LJ, Johnson KS. Focal breast pain: Does breast density affect the need for ultrasound? Acad Radiol [Internet],2017:24(1):53-9. Available from: http://dx.doi.org/10.1016/j.acra.2016.09.004
25. Owen WA, Brazeal HA, Shaw HL, Lee MV, Appleton CM, Holley SO. Focal breast pain: imaging evaluation and outcomes. Clin Imaging [Internet]. 2019;55:148–55. Available from: http://dx.doi.org/10.1016/j.clinimag.2019.02.008
26. Altıntas Y, Bayrak M. Assessment of breast cancer incidence in patients with mastalgia and routine screening. Int J Surg Res Pract [Internet], 2019, 6(1). Available from: http://dx.doi.org/10.23937/2378-3397/1410094
27. Egwuonwu OA, Anyanwu SN, Chianakwana GU, Ihekwoaba EC. Breast pain: Clinical pattern and aetiology in a breast clinic in eastern Nigeria. Niger J Surg [Internet],2016:22(1):9-11. Available from: http://dx.doi.org/10.4103/1117-6806.169822
28. Arslan M, Küçükerdem HS, Can H, Tarcan E. Retrospective analysis of women with only mastalgia. J Breast Health [Internet],2016:12(4):151-4. Available from: http://dx.doi.org/10.5152/tjbh.2016.2944
29. Altıntas Y, Bayrak M. Evaluation of 1294 female patients with breast pain: A retrospective study. Adv Ther [Internet],2018:35(9):1411-9. Available from: http://dx.doi.org/10.1007/s12325-018-0769-y
30. Tumyan L, Hoyt AC, Bassett LW. Negative predictive value of sonography and mammography in patients with focal breast pain. Breast J [Internet],2005:11(5):333-7. Available from: http://dx.doi.org/10.1111/j.1075-122X.2005.00018.x
31. Leung JWT, Kornguth PJ, Gotway MB. Utility of targeted sonography in the evaluation of focal breast pain. J Ultrasound Med [Internet],2002:21(5):521-6. quiz 528–9. Available from: http://dx.doi.org/10.7863/jum.2002.21.5.521
32. Noroozian M, Stein LF, Gaetke-Udager K, Helvie MA. Long-term clinical outcomes in women with breast pain in the absence of additional clinical findings: mammography remains indicated. Breast Cancer Res Treat [Internet],2015:149(2):417-24. Available from: http://dx.doi.org/10.1007/s10549-014-3257-3
33. Cook N, Batt J, Fowler C. Symptomatic breast cancers and why breast pain may not always need clinical review. Eur J Breast Health [Internet],2020:16(4):267-9. Available from: http://dx.doi.org/10.5152/ejbh.2020.5730
34. Devolli Disha E, Manxhuka Kerliu S, Baruti Gafurri Z, Topciu V, Zhubi B, Paqarizi H. Evaluation of breast symptoms with mammography and ultrasonography. J Health Sci [Internet],2011:1(3):180. Available from: http://dx.doi.org/10.17532/jhsci.2011.135
35. Rogulski L, Bińczyk J. Estimated breast cancer risk and screening outcomes among premenopausal women with non-cyclic mastalgia. Ginekol Pol [Internet]. 2013:84(9):754-7. Available from: http://dx.doi.org/10.17772/gp/1635
36. Okello J, Kisembo H, Bugeza S, Galukande M. Breast cancer detection using sonography in women with mammographically dense breasts. BMC Med Imaging [Internet], 2014, 14(1). Available from: http://dx.doi.org/10.1186/s12880-014-0041-0
37. Mema E, Cho E, Ryu Y-K, Jadeja P, Wynn R, Taback B *et al*. In the setting of negative mammogram, is additional breast ultrasound necessary for evaluation of breast pain? Curr Probl Diagn Radiol [Internet],2019:48(2):117-20. Available from: http://dx.doi.org/10.1067/j.cpradiol.2017.12.007
38. Health Quality Ontario. Ultrasound as an adjunct to mammography for breast cancer screening: A health technology assessment. Ont Health Technol Assess Ser,2016:16(15):1-71.