



SPECTRUM OF INFLAMMATORY BREAST LESIONS: A RETROSPECTIVE FROM TERTIARY CARE CENTER OF KUMAON REGION

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ABSTRACT Mastitis or inflammation of breast is group of lesion with varied etiology including infectious and non infectious causes. The early and accurate diagnosis of inflammatory breast lesions is essential to provide appropriate management and prevention. The aim of this study is to find out the spectrum of inflammatory breast lesions diagnosed on cytology and associated clinical features. This retrospective study includes cases with diagnosis of granulomatous and non-granulomatous mastitis retrieved over duration of 5 years. The demographic profile of patients including age and sex was noted. The history including site, size, laterality, duration, consistency, history of lactation and diagnosis was retrieved. The cases were broadly classified into granulomatous and non-granulomatous mastitis based on the cytological diagnosis. The statistical analysis included calculation of mean age, percentage of type of inflammatory breast lesion and association with age, sex. **Result:** 148 patients with diagnosis of mastitis on FNAC were retrieved, 93.2% (138/148) females were diagnosed with mastitis and 6.7% (10/148) patients were found to be males. The patient age varied from 16 to 70 years with mean age being 33.8 years. 98.6% female patients were found to be parous and 54% were lactating. The right breast was involved in 55.4% cases, left breast was involved in 41.8% cases. The mean size of the lumps was 2.7cms. 28.3% were granulomatous mastitis and 70.6% were non-granulomatous mastitis which included 58.4% cases of acute suppurative mastitis, 37.7% cases of non-specific mastitis and 3.7% cases of chronic mastitis. **Conclusion:** Inflammatory conditions affecting breast occurs over a wide range of age group with variable clinical presentations. The early diagnosis by FNAC can guide surgeons for appropriate early management and prevention of complications.

KEYWORDS : Mastitis, FNAC.

INTRODUCTION:

The breast swelling is one of the common clinical complain affecting females. The neoplastic and non-neoplastic lesions affecting breast are of varied etiology.⁽¹⁾ Mastitis or inflammation of breast can affect women of any age, however the predominantly affected group is reproductive age group, including lactating females. The mastitis may or may not accompany infections.⁽²⁾ The non-infectious causes of mastitis vary from idiopathic granulomatous inflammation to foreign body reactions, the infectious may be associated with lactation and conditions like duct ectasia in non-lactational period.⁽³⁾ The breast abscess which is a type of purulent mastitis and is a localized collection of purulent material occurs in lactating women and sometimes in non-lactating women also.⁽⁴⁾ The early and accurate diagnosis of inflammatory breast lesions are essential to provide appropriate management and prevention of worse outcome in case of delay management.⁽⁵⁾ The fine needle aspiration cytology (FNAC) is a technique used for diagnosis of breast swellings. The FNAC can provide early and accurate diagnosis for early management. The aim of this study is to find out the spectrum of inflammatory breast lesions diagnosed on cytology and associated clinical features.

MATERIAL AND METHODS:

This retrospective study was done in department of Pathology, Government Medical College, Haldwani, Nanital, Uttarakhand in August 2020. The cases with diagnosis of inflammatory breast lesions including granulomatous and non-granulomatous mastitis were retrieved over a duration of 5 years from August 2015 to August 2020. The available clinical data was extracted from records. The demographic profile of patients including age and sex was noted. The possible relevant history including site, size, laterality, duration, consistency and diagnosis was retrieved. Other relevant clinical information including history of lactation was considered. The cases were broadly classified into Granulomatous and Non-granulomatous mastitis based on the cytological diagnosis. Granulomatous mastitis is defined as clusters of epithelioid aggregates with or without associated multinucleated giant cells, lymphocytes and plasma cells. Non-granulomatous mastitis includes acute suppurative mastitis or breast abscess, chronic non-specific mastitis.^(6,7)

INCLUSION CRITERIA:

1. Diagnosis of mastitis.

EXCLUSION CRITERIA:

1. Repeated case.

2. Post treatment.
3. Incomplete clinical history.

The statistical analysis included calculation of mean age, percentage of type of inflammatory breast lesion and association with age, sex.

RESULT:

During the study period, 148 patients with diagnosis of mastitis on FNAC were retrieved from records. In the study, according to gender distribution, 93.2% (138/148) females were diagnosed with mastitis and 6.7% (10/148) patients were found to be males. The patient age varied from 16 to 70 years with mean age being 33.8 years. In terms of age distribution in decades, 5.4% (8/148) patients belongs to 11-20 year of age group, 33.1% (49/148) were in age group of 21-30 years, 35.1% (53/148) were in age group of 31-40 years, 16.2% (24/148) were in age group of 41-50 years, 5.4% (8/148) were in age group of 51-60 years and 4.0% (6/148) were found to be greater than 60 years (Table 1).

Table1: Shows age wise distribution of inflammatory breast lesions.

Age	Number
0-10	0
11-20	8
21-30	49
31-40	53
41-50	24
51-60	8
Greater than 60	6
Total	148

In terms of parity, among 138 female patients, excluding two patients all were parous (98.6%) and 54% (80/148) were lactating at the time of presentation. Out of 148 cases, 65.5% (97/148) cases presented within less than one month of developing disease, 32.4% (48/148) presented with in a duration of one to four month and 2.0% (3/148) cases presented with duration of greater than 4 month. The right breast was involved in 55.4% (82/148) cases, left breast was involved in 41.8% (62/148) cases and bilateral breast was involved in 2.7% (4/148) cases. Most common site affected by mastitis was upper outer quadrant (42.8%) followed by lower inner (20.2%), upper inner (18.9%), lower outer (11.2%) and central (6.9%) quadrant.

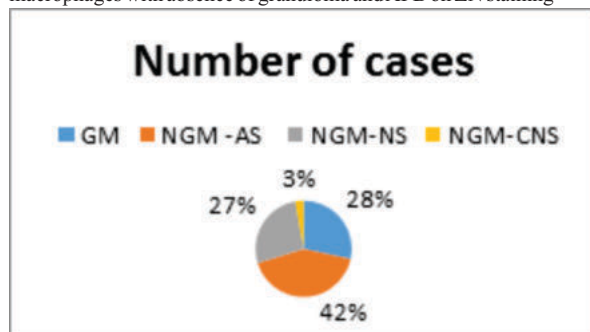
The mean size of the lumps was 2.7cms with a range of 0.5 to 12 cm.

The size distribution of the lesion includes 7.4%(11/148) cases with less than 1 cm, 33.1% (49/148) cases with 1-2 cm lump, 30.4% (45/148) cases with 2-3 cm lump, 17.5% (26/148) cases with 3-4 cm lump and 12.8% (19/148) cases with a lump greater than 4 cm in size. In terms of presence or absence of pain, 64.1% (95/148) cases presented with a painful lump and was the commonest presenting complain while 35.9% (53/148) cases presented with a painless lump or swelling. The consistency of inflammatory breast lesions was firm in 95.3% (141/148) cases while the consistency was soft in 2.7% (4/148) cases and hard in 2% (3/148) cases.

FNAC was performed in all 148 cases, 28.3% (42/148) were granulomatous mastitis and 70.6% (106/148) were non-granulomatous mastitis which included 58.4% (62/148) cases of acute suppurative mastitis, 37.7% (40/148) cases of non-specific mastitis and 3.7% (4/148) cases of chronic mastitis. (Figure 1)

In this study, 42 cases were found to be of granulomatous mastitis, out of which 4 cases were of tubercular mastitis and 38 cases were of idiopathic granulomatous mastitis. In cases of tubercular mastitis, the cytology smears demonstrated clusters of epithelioid multinucleated giant cells, lymphocytes and plasma cells against a background containing necrosis, cell debris and singly scattered ductal cells. In all the 4 smears, acid fast bacilli was demonstrated on Zheil-Neelsen (ZN) staining and were categorized as tubercular mastitis. The 38 cases of idiopathic granulomatous mastitis, demonstrated ill-defined to well-defined epithelioid cell granulomas with minimal inflammation and absence of necrosis in background.

(Figure 1) In this study, 62 cases were of acute suppurative mastitis, in which smears demonstrated acute inflammatory infiltrates including neutrophils against a background containing debris, edema fluid and occasional loosely cohesive ductal epithelial cells. (Figure 2) In this study, 40 cases were of non-specific mastitis, in which smears demonstrated mixed inflammatory infiltrates including lymphocytes, macrophages, and neutrophils with absence of ill defined or well defined granuloma along with absence of AFB on ZN staining. In this study, 4 cases were of chronic non-specific mastitis, in which smears demonstrated inflammatory infiltrates comprising of lymphocytes and macrophages with absence of granuloma and AFB on ZN staining



Graph 1: Shows distribution of granulomatous and non-granulomatous mastitis. (GM- granulomatous mastitis, NGM-AS- non-granulomatous mastitis acute suppurative, NGM-NS – non-specific non- granulomatous mastitis, NGM-CNS- chronic nonspecific mastitis)

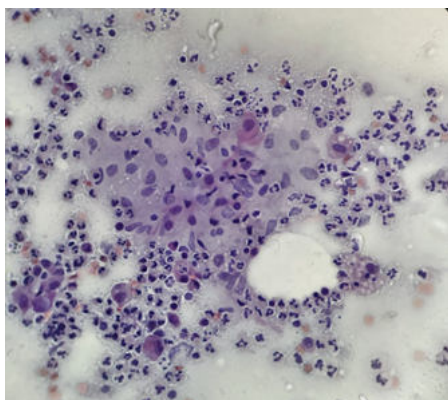


Figure 1: Ill defined epithelioid cell aggregate against a lipidaceous background containing mixed inflammatory infiltrate (Pap stain: 40X).

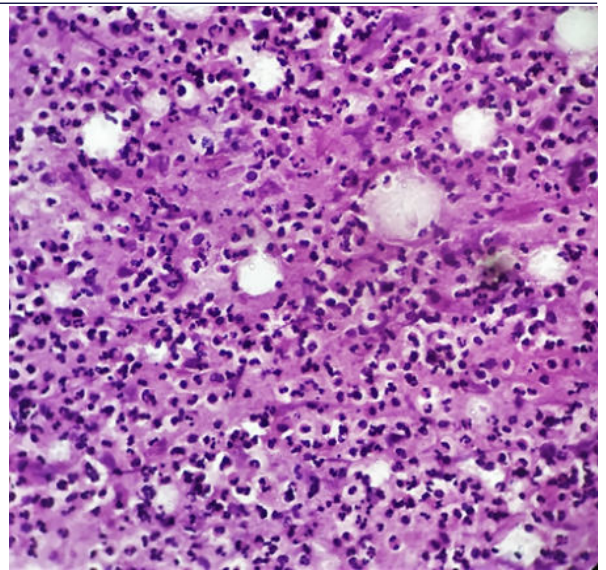


Figure 2: Shows dense inflammatory infiltrate comprising predominantly of polymorph. (MGG: 40X)

DISCUSSION:

The mastitis is a common entity among breast lesions, predominantly affecting reproductive age group females. Mastitis affecting males and elderly females is not a rare sight.⁽⁸⁾ In this study 93.2% of mastitis case occurred in females and 6.8% occurred in males. The studies done by **Prasad S et al⁽⁹⁾** and **David S Barreto et al⁽¹⁰⁾** also found mastitis to be affecting predominantly females. The common age group affected by mastitis belongs to 31-40 years followed by 21-30 years and 41-50 years reflecting the predominant involvement of females in reproductive age group. The studies done by **Gupta RK et al⁽¹¹⁾** and **David S Barreto et al⁽⁸⁾** also found that mastitis commonly affects females in reproductive age groups. In this study, 57.9% females out of 138 cases were found to be lactating and acute suppurative mastitis was the commonest lesion among lactating women. Since breast tissue undergoes cytological changes during pregnancy and lactation and repeated micro trauma occur to breast during lactation, females of reproductive age group became more susceptible for developing mastitis.⁽¹²⁾

Clinical presentation of nearly two-third (97 cases) were of short duration with clinical history of less than 1 month. Since mastitis are inflammatory lesions and mostly associated with pain and tenderness, the presenting history is often of short duration. Studies done by **Eve Boakes et al⁽³⁾** found that acute mastitis and lactational mastitis presents clinically with short duration. **Eve Boakes et al⁽³⁾** and **Prasad S et al⁽⁹⁾** in their studies found that painful lumps of mastitis presents early while idiopathic granulomatous mastitis has a variable duration of presentation. In this study, no significant variation in terms of laterality was observed. The right breast was affected in 82 patients (55.5%) and the left breast was affected in 62 patients (41.8%), 4 patients (2.7%) had bilateral disease. The mean size of the breast lumps was 2.7 cms and nearly two-third (39.8%) of breast lumps were less than 2.0 cms in maximum dimension. As acute mastitis presents as a rapidly enlarging painful lump, the presentation is early.

Inflammatory lesions of breast - mastitis and cellulitis are tender to touch and soft to firm in consistency. 95.3% lumps were firm in consistency in our study. **Klein S et al⁽¹³⁾** in their study found that inflammatory lesions of breast were tender to touch and soft to firm in consistency, may be more circumscribed if an abscess has formed.

Granulomatous mastitis is an uncommon condition and may mimic carcinoma radiographically and clinically. In this study, 28.37% (42/148) cases were found to be of granulomatous mastitis, out of which 4 cases were of tubercular mastitis and 38 cases were of idiopathic granulomatous mastitis. Etiology of granulomatous mastitis is variable, ranging from tuberculosis, fungal, silicone, tumor related, sarcoidosis, fat necrosis, foreign body to idiopathic.^(7,14,15) Idiopathic granulomatous mastitis is particularly troublesome for the patient because of its tendency to recur.⁽⁸⁾

We had 62 cases of acute mastitis, in which smears demonstrated acute inflammatory infiltrates against a background containing debris,

edema fluid and occasional loosely cohesive ductal epithelial cells. The cases of chronic mastitis maybe the result of persistence of an acute mastitis, a reaction to retained secretion in fibrocystic disease or duct ectasia.⁽¹⁶⁾

Among 148 cases, we had 40 cases of non-specific mastitis and the smears demonstrated mild mixed inflammatory infiltrates against a background containing debris and occasional reactive ductal cells. No granuloma or epithelioid or multinucleated giant cells were demonstrated in these smears. The possible reason for development of non specific mastitis might be the hormonal changes that occur during peri and post-menopausal period causing ducts to become clogged with keratinocytes and debris, leading to proliferation of bacteria and inflammation.^(17,18) although the history of drug intake was not undertaken in this study because of limitations of retrospective study, drugs like anti-hypertensive medications may lead to prolactin imbalances, predisposing the women for mastitis while comorbid conditions favoring infections like diabetes also makes patients more prone to infections^(19,20) and might be one of the factor of developing inflammatory lesions of breast among males.

According to literature, Inflammatory lesions of breast commonly affects parous females in the reproductive age groups.^(1,9,10) These findings were confirmed in our study, although there were some exceptions. Two patients diagnosed with granulomatous mastitis were young nulliparous females, whereas there were 6 elderly and postmenopausal females affected with disease. Among 10 male patients, 5 cases were of non-specific mastitis, 4 cases were of acute mastitis and one was categorized as tubercular mastitis.

FNAC is a simple and reliable technique in diagnosing breast lesions⁽²¹⁾ including inflammatory breast lesions. The diagnosis and early management of inflammatory breast lesions on cytology determine the treatment protocol. The early FNAC in cases of acute suppurative mastitis can prevent destruction of breast parenchyma, yield pus or blood mixed aspirated material for culture and antibiotic sensitivity and institution of early management including repeated needle aspiration with suction and drainage along with antibiotics or more traditional incision or drainage.⁽²²⁾ delay in diagnosis and treatment of acute suppurative mastitis can lead to more complicated surgical approaches which can lead to complication like glandular tissue adhesion, breast deformity or ugly scar.⁽²³⁾

The cases of granulomatous mastitis while can be diagnosed on cytology, the gold standard is histopathology⁽²⁴⁾ which is a limitation of present study as histopathological diagnosis of granulomatous mastitis could not be ascertained because of retrospective nature of the study. Still FNAC has a role in granulomatous mastitis, as idiopathic granulomatous mastitis can be resolved in fair number of patients and observation is only required⁽²⁵⁾ or by medical management by steroid administration while few may require surgical management including excisional biopsy and partial mastectomy.⁽²⁶⁾

The usefulness of FNAC is not limited to diagnosing inflammatory breast lesion but excluding other important differential diagnosis, granulomatous mastitis can mimic clinically with carcinoma breast⁽²⁷⁾ while acute suppurative mastitis can mimic inflammatory carcinoma breast which can be diagnosed by presence of malignant ductal cells on cytology smears.⁽²²⁾

CONCLUSION:

Inflammatory conditions affecting breast occurs over a wide range of age group with variable clinical presentations. The early diagnosis by FNAC can guide surgeons for appropriate early management and prevention of complications.

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