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CLINICOPATHOLOGICAL PATTERN OF BENIGN BREAST DISEASES ON FINE NEEDLE ASPIRATION CYTOLOGY

Pathology

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ABSTRACT

Background:- Benign breast disease deserve attention because of increased prevalence and their impact on patients life and cancerous potential of some high risk breast lesions. FNA is simple, cheaper and less time consuming sampling technique for pre- operative pathological diagnosis compared to core needle biopsy. FNAC is an established and highly accurate method for diagnosing breast lesion It has been a blessing for cystic lesions for being both diagnostic and therapeutic procedure. It has been helpful in identifying infectious diseases namely breast abscess and mastitis. The present study shall help us to determine the spectrum of benign breast lesions commonly observed in our place and the role of FNAC in diagnostic workup of females presenting with breast masses. **Material and methods** This study was conducted in GMC Jammu for a period of 2 years from 1 Nov 2020 to 31 oct 2022. Cases were subjected to relevant history pertaining to breast lump, detailed local and systemic examination and relevant radiological investigations were noted. Then procedure of FNAC was performed and slides prepared and examined. **Results** Mean age of patients was 29 years. Majority of patients were married (78%). In majority of cases (51.5%) , left breast was more commonly involved than right breast (45%). Bilateral breast was involved in (3.5%) cases. Majority of patients presented with breast lumps (67.7%). Majority of breast lesions (34.6%) were seen in upper outer quadrant of breast followed by upper inner quadrant of breast (30.4%). Most commonly diagnosed benign breast lesion was fibroadenoma (63.1%) followed by fibrocystic disease (9.2%) and breast abscess (6.5%), (4.2%) cases presented with mastitis. Least commonly diagnosed lesions were papilloma (0.8%) and phyllodes tumor (0.8%). Diagnostic accuracy was 100% in cases of fibroadenoma, fibrocystic disease, phyllodes and papilloma. It was 88.9% in case of breast abscess and 80% in case of granulomatous mastitis. **Conclusion** In females, benign breast disease is common problem as compared to malignancy. Benign conditions of breast can be diagnosed easily on FNA if done accurately. The procedure is devoid of major complications and is well tolerated by the patients. In developing countries like India, FNAC is highly useful in the diagnosis of benign breast diseases.

KEYWORDS

Benign Breast Diseases, FNAC, Fibroadenoma

INTRODUCTION

Breast is a glandular organ. The risk factors for benign and malignant lesions include low parity, nulliparity, low age at 1st birth and late menopause. Benign breast diseases (BBDs) are the common cause of breast problems in females. They are more frequent than the malignant ones and account for 90% of clinical presentation. Until recently, benign disorders of the breast were given less importance than breast cancer **(Anmod GL *et al.*, 2017).**

Fibroadenoma, fibrocystic change and breast abscesses account for most of the benign lesions in most studies in developing countries. The diagnosis can be with the use of mammography, ultrasound, magnetic resonance imaging, fine needle biopsies and incision or excision biopsies **(Chalya P L et al.,2016).** It has been noted that non cancerous pathology of the breast has always been neglected compared to breast cancer inspite of the fact that benign condition account for 90% of the clinical presentation related to breast **(Rajkumar et al.,2017**).

BBDs are common in younger population and incidence rises during 2nd decade and peaks in 3rd and 4th decade. Benign breast disease deserve attention because of increased prevalence and their impact on patients life and cancerous potential of some high risk breast lesions. With increasing vigilance in the general population, especially about breast pathologies, and the associated soltitude and stress that this condition may lead to, the knowledge that breast cancer can have grim consequences compels patients to seek medical advice. **(Usman K et al., 2015**).

Triple assessment by clinical examination,radiological imaging and pathological examination has been a standard approach in evaluation of breast lumps. Both FNAC and core needle biopsy have been used successfully for preoperative diagnosis. FNA is simple and less invasive procedure where cells are disloged into the needle **(Suen MWM*et al.*,1996).**

A palpable breast mass is the most common symptom associated with both benign and malignant diseases of the breast . Although benign breast lesions are common, every patient should be evaluated to exclude or confirm malignancy as malignancy is managed by more radical surgery and adjuvant therapy. FNAC is simple to perform, well accepted by majority of patients, involves minimal discomfort to the patient and can be performed on an outpatient basis.**(Mohan BP *et al.*, 2018).**

FNAC may be used for palpable or non-palpable and benign or malignant breast lesions. Palpable lesions may be either solid or cystic and non palpable lesions are detected by radioimaging study **(Shrestha A et al.,2011).** FNAC has its own benefits, being a quick and simple to perform , cheap procedure featuring a short turnover time: high diagnostic accuracy; less patient discomfort; cosmetically least disfiguring, provision of ancillary tests; and curative relief in some cases, as in case of aspiration of a cyst (**Mitra S et al.,2015).** A method of definitive diagnosis to patients who presented at outpatient department is needed, in order to reassure the patient to offer best possible treatment. FNA can be repeated if an adequate sample is not obtained **(Kochher AK et al., 2013**). It has become a diagnostic tool to access the nature of palpable breast lesions. It helps in planning of treatment of breast lumps. Accuracy can be improved by multiple sampling from different angles and by using ultrasound guidance in very small lumps **(Madan M et al., 2015**) For clinically and radiologically benign looking breast lesions, FNA is the first sampling method and confirmation of benign diagnosis on it has helped in saving time,cost and most important in relieving patient anxiety. It has been a blessing for cystic lesions for being both diagnostic and therapeutic procedure. It has been helpful in identifying infectious diseases namely breast abscess and mastitis **(Nirmala C *et al.*, 2015).** To differentiate benign from malignant lesions is one of the major goals of FNAC. The limitation of FNAC include difficulty to differentiate ductal carcinoma in situ (DCIS), atypical ductal hyperplasia from low grade DCIS, and fibroadenoma from phylloides tumor.

In medically under resourced developing countries, where more than 80% of the worlds population lives, FNA is the test for all palpable lesions, in a setting where preoperative imaging and core biopsy and histopathology are not readily available and are expensive options. FNAC is routinely done in our institution which is tertiary care institute. The present study shall help us to determine the spectrum of benign breast lesions commonly observed in our place and the role of

FNAC in diagnostic workup of females presenting with breast masses.

MATERIAL AND METHODS

This study was conducted in postgraduate department of Pathology, Government Medical College, (Tertiary Care Hospital). It was prospective study for a period of one year from 1st November 2021 to 31stOctober 2022 and retrospective study for a period of 1 year from 31st October 2021 to 1stNovember 2020.

Inclusion Criteria:-

All females with unknown primary diagnosis of breast lump identified by themselves or by clinicians.

Patients consented for inclusion in study according to designed proforma.

Exclusion Criteria:-

Patients with recurrent malignancy.
Patients with obvious clinical features of malignancy or those who on work up were diagnosed as carcinoma.
Past or current chemo therapeutic or prevention treatment.

The cases were subjected to relevant history pertaining to breast lump, duration, marital status, parity, lactation, injury, age of menarche, age at 1st pregnancy, age at menopause, contraception used, any family history of breast disease.

General physical examination, systemic examination and local examination of swelling was done. Whether lump was unilateral/bilateral, well defined/ill defined, size of lump, location, mobility/adherence to adjacent structures, secondary skin changes, nipple discharge/ retraction and axillary lymph node enlargement.

Radiological investigations like USG and mammography were recorded as and when done.

All data was recorded in prestructured proforma. Procedure was explained to patient and FNAC of breast lump was done under all aseptic conditions and slides prepared immediately. The pap and giemsa stained smears were then subjected to microscopic examination and categorized into various benign breast lesions. A correlation with histopathology was done wherever possible.

RESULTS:

During the 2 year study period (retrospective study from October 31 2021 to November 1 2020 and prospective study from November 1 2021 to October 31 2022) a total of 260 female patients presenting with signs and symptoms of benign breast diseases were evaluated with detailed clinical and radiological findings. FNAC was done in all the cases. No major complication was detected. Diagnosis was made after clinical examination and subsequent FNAC. FNAC report was correlated with histopathology report in 136 cases. Most patients were managed conservatively.

Table 1: Age Wise Distribution of the Patients.

AGE GROUP (YRS)	FREQUENCY(n=260)	PERCENTAGE(%)
11-20	44	16.9
21-30	122	46.9
31-40	66	25.4
41-50	23	8.8
51-60	5	1.9
TOTAL	260	100

Majority of patients were between 21 – 40 years of age (72.3%) and least in 51 -60 years age group.

LOCATION OF BREAST LESION	FREQUENCY (n=260)	PERCENTAGE(%)
Upper Outer Quadrant	90	34.6
Upper Inner Quadrant	79	30.4
Lower Outer Quadrant	58	22.3
Lower Inner Quadrant	13	5.0
Subareolar Region	11	4.2
Retroareolar Region	9	3.5
Total	260	100.0

Majority of lesions were located in the upper outer quadrant accounting for 90(34.6%) cases followed by upper inner quadrant accounting for 79(30.4%) cases.

Distribution of the patients on the basis of fnac findings.

DIAGNOSIS BY FNAC	FREQUENCY (n=260)	PERCENTAGE
FIBROADENOMA	164	63.1
FIBROCYSTIC DISEASE	24	9.2
ABSCESS	17	6.5
BENIGN CYST	13	5.0
ACUTE MASTITIS	11	4.2
LACTATIONAL ADENOMA	10	3.8
GALACTOCELE	10	3.8
GRANULOMATOUS MASTITIS	7	2.7
PAPILLOMA	2	0.8
PHYLLODES	2	0.8
TOTAL	260	100.0

Fibroadenoma was the most commonly diagnosed benign breast lesion on FNAC in our study. Least commonly diagnosed lesions in our study were papilloma and phyllodes tumor accounting for 0.8% cases each.

Distribution of the patients on the basis of histopathology findings.

DIAGNOSIS BY HISTOPATHOLOGY (GOLD STANDARD)	FREQUENCY (n=260)	PERCENTAGE(%)
FIBROADENOMA	101	38.8
FIBROCYSTIC DISEASE	14	5.4
PHYLLOIDES	2	0.8
ABSCESS	9	3.5
GRANULOMATOUS MASTITIS	5	1.9
LACTATIONAL ADENOMA	0	0
GALACTOCELE	0	0
PAPILLOMA	2	0.8
BENIEGN CYST	0	0
MASTITIS	1	0.4
MALIGNANT	2	0.8
UNAVAILABLE	124	47.6
TOTAL	260	100.0

In our study, out of the total 260 cases , histopathology was available in only 136 cases and was not available in 124 cases(Because FNAC was diagnostic and therapeutic in cystic swellings and surgery was not done in small lumps and some benign breast diseases). 101 cases which were diagnosed as fibroadenoma on FNAC were confirmed as fibroadenoma on histopathogy. 14 cases which were diagnosed as fibrocystic disease and 2 cases which were diagnosed as phyllodes tumor on FNAC were confirmed on histopathology.Only 1 case which was diagnosed as granulomatous mastitis on FNAC was diagnosed as ductal carcinoma on histopathology and 1 case which was diagnosed as abscess on FNAC was diagnosed as carcinoma on histopathology. Rest cases of granulomatous mastitis and abscess were confirmed on histopathology.

Diagnostic accuracy of FNAC

DISEASE DIAGNOSED ON FNAC	HISTOP-ATHOLOGY	CORRECT	INCORRECT	ACCURACY(%)
FIBROA DENOMA	101	101	-	100
FIBROCYSTIC DISEASE	14	14	-	100
ABSCESS	9	8	1	88.9
GRANULOMATOUS MASTITIS	5	4	1	80
PHYLLODES	2	2	-	100
PAPILLOMA	2	2	-	100
MASTITIS	1	1	-	100

Out of the total cases whose FNAC was done in our hospital, those cases whose histopathology was also done in our hospital were taken in our study and the results of fnac and histopathology were compared

and correlated. Accuracy was 100% in cases of fibroadenoma, fibrocystic disease, phyllodes, papilloma and mastitis. Accuracy was 80% in cases of granulomatous mastitis (1 case of granulomatous mastitis was diagnosed as ductal carcinoma on histopathology). and 88.9% in cases of abscess %(1 case of breast abscess was diagnosed as carcinoma on histopathology

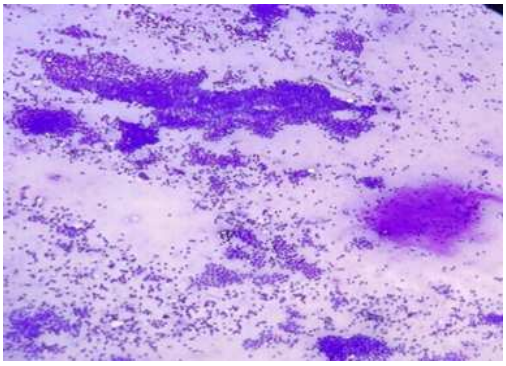

Figure1: Fibroadenoma- FNA Smear showing sheets of ductal epithelial and myoepithelial cells, numerous bare bipolar nuclei and fragment of fibromyxoid stroma (MGG 400X)

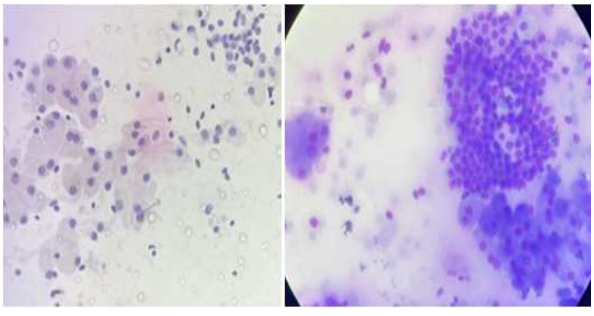

Figure 2&3: Fibrocystic disease- FNA Smear showing sheet of apocrine metaplastic cells, ductal epithelial cells and few bare bipolar nuclei.(PAP & MGG 400X)

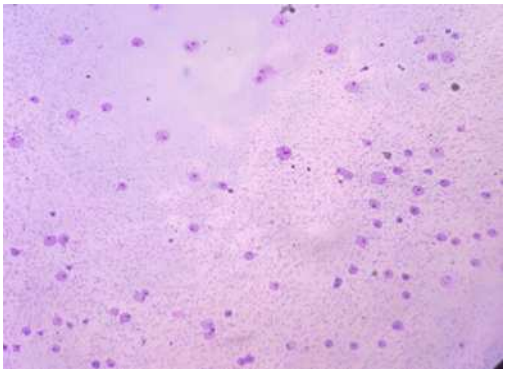

Figure 4: Benign Cyst –FNA Smear showing numerous macrophages in the background containing proteinaceous structureless material (MGG 100X)

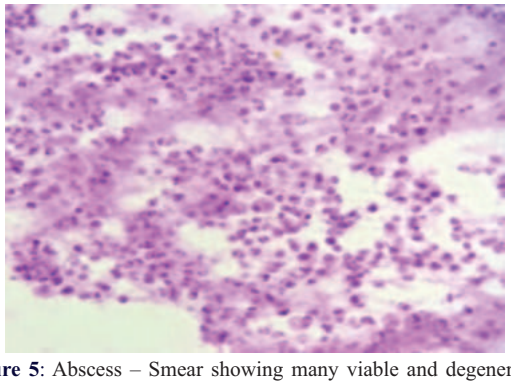

Figure 5: Abscess – Smear showing many viable and degenerated polymorphonuclear cells, cystic macrophages and few eosinophils (PAP 400X)

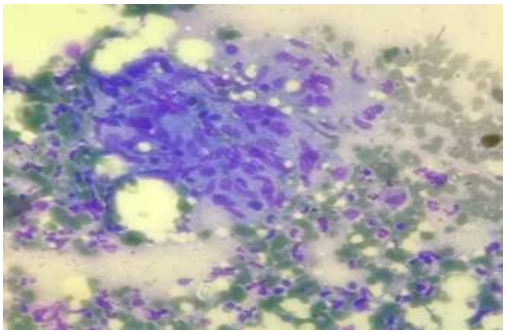

Figure 6: Granulomatous mastitis- FNA Smear showing epithelioid cell granuloma in a haemorrhagic background (MGG 400X)

DISCUSSION AND CONCLUSION

This study was conducted to study the patterns of various benign breast lesions and the role of FNAC in diagnosis of various benign breast lesions.

In the present study, FNAC was performed in 260 patients presenting with breast lesions reffered to postgraduate department of pathology at Government medical college Jammu. All the cases were subjected to relevant history, general physical examination, systemic examination, local examination. Radiological investigations like USG and mammography were recorded wherever available.

In the present study the age of the patient ranged from 13 to 60 years. Mean age was 29 years. The age range reported by other authors was 18 – 60 years by **Nagger S et al.,(2018),** 14-70 years by **Rajkumar et al 2017**, 13- 78 **Mohan B P et al.,(2018**)which is quite comparable to our study.

Majority(46.9%) of patients in our study were in the age group of 21-30 years followed by 25.4% in the age group of 31-40 years. Minimum cases 1.9% were seen in the age group of 51-60. **Bagali et al (2019**) reported maximum number of patients(48%) in the age group of 21-30 years followed by 32% in the age group of 31-40 years which is comparable to our study.

In our present study, the left breast was more commonly involved (51.5%) than right side of breast (45%). 3.5% cases have bilateral breast involvement. In the study by **Gupta R et al,(2017)**, left breast was more commonly involved (49%) than right side of breast (48%). 3% have bilateral breast involvement, which is comparable to our study**.**

In the present study, majority of lesions were located in upper outer quadrant of breast(34.6%) followed by upper inner quadrant (30%). Lower outer quadrant has 22.3% cases, lower inner quadrant has 5%. The results are similar with the study by **Khanan K F et al(2018**) which showed upper outer quadrant of breast involved most commonly

In the present study, most commonly diagnosed benign breast lesion was fibroadenoma accounting for 63.1% of cases. Smears showed clusters of ductal epithelial and myoepithelial cells and numerous bare bipolar nuclei. In the study by **Reddy K R et al(2019)**, fibroadenoma comprised 65.8% of total cases of benign breast disease.

In the present study, second most commonly diagnosed benign breast lesion was fibrocystic disease accounting for 9.2% of cases. Smears show epithelial cells with scattered bare bipolar nuclei, apocrine metaplastic cells, macrophages and fluid. In the study by **Ogbuanya AU et al (2021,)** fibrocystic disease comprised 15.7% of total cases.

In the present study, acute mastitis was seen in 4.2% of cases. Granulomatous mastitis was seen in 2.7% of cases..1 case of granulomatous mastitis turned out to be carcinoma on histopathology, Rest were confirmed on histopathology. In the study by **Banik T et al (2018**), 3.6% cases were mastitis and 2.7% cases were granulomatous mastitis.

In present study, there were 6.5% cases of abscess, 0.8% cases each of papilloma and phyllodes. 1 case of breast abscess turned out to be carcinoma on histopathology, Rest were confirmed on histopathology.

In the study by **Samal S et al,(2019)**, 16% cases were breast abscess, 4% cases were phyllodes tumor and 1% cases of papilloma.

In the present study, 3.8% of cases present with galactocele. In the study by **Dubey B et al (2019)**, 2% of cases present with galactocele. In the study by **Rajkumar et al (2017)**, 1.30% of cases present with galactocele.

In the present study, we see that most cases of breast abscess and galactocele were seen within 1 year of lactation. Few cases of fibroadenoma, fibrocystic disease and mastitis were also seen within 1 year of lactation. **Samal S et al (2019)** in their study showed that 36 out of 110 cases of fibroadenoma were detected during 0-6 months of lactation. All cases of breast abscess were present in 0-6 months of lactation

In the present study, FNAC results were correlated with histopathology wherever possible. Accuracy rates of FNAC were 100% for fibroadenoma, fibrocystic disease, phyllodes, papilloma and mastitis. And rates were 88.9% for breast abscess and 80% for granulomatous mastitis. **Samal S et al (2019)** in their study showed that accuracy of FNAC was 100% in detecting fibroadenoma, breast abscess, duct papilloma and cystic disease.

In conclusion the study shows that FNAC is rapid, cost effective, highly accurate and reliable method of diagnosis in breast lesions as breast is superficial easily accessable organ. The diagnosis depends on cytomorphological features along with clinical and radiological findings. The procedure is devoid of major complications and is well tolerated by the patients. In females, benign breast disease is common problem as compared to malignancy. Benign conditions of breast can be diagnosed easily on FNA if done accurately. In developing countries like India, FNAC is highly useful in the diagnosis of benign breast diseases.

REFERENCES

1. Anmod GL, Swami G, Dhal G. Clinicopathological pattern of benign breast diseases among female patients at a tertiary care centre in india. *Med Pulse International Journal of Surgery* 2017;3(1):12-15.
2. Bagale PS, Dravid NV, Bagale S et al. Clinicopathological study of benign breast diseases. *International Journal of Health Sciences & Research* 2013;3(2):47-54.
3. Bagali N and Bagali M. Benign Breast Diseases- A Clinicopathological Study. *International Journal of Current Research* 2019;11(08):6248-50.
4. Bukhari MH, Arshad M, Jamal S, Niazi S, Bashir S, Bakshi I M et al. Use of fine needle aspiration aspiration in the evaluation of breast lumps. *Pathology Research International* 2011;2011:689521.
5. Banik T, K S, Vaithyanathan A, Kotasthane D S. Cytomorphology of breast lesions with historadiological correlation in a tertiary care centre of puducherry. IP Archives of cytology and histopathology research, January- March 2018;3(1):1-6.
6. Chalya PL, Manyama M, Rambau P F, Kapesa A, Nballaba SE, Masalu N *et al.*Clinicopathological pattern of benign breast diseases among female patients at a tertiary health institution in Tanzania. *Tanzania Journal of Health Research* 2016;18(1):
7. Dubey B, Jalaly F. Spectrum of benign breast lesions in Females of Age group 11-60 years – A hospital based study. *Saudi Journal of Pathology and Microbiology* 2019;4(11):861-867.
8. Gupta R, Dewan D, Kumar D, Sharma R. Utility of fine needle aspiration cytology as a screening tool in diagnosis of breast lumps. *Int Surg J 2017*;
9. Jain SB, Jain I, Shrivastav J and Jain B. A clinicopathological study of breast lumps in patients presenting in surgery OPD in a referral hospital in Madhya Pradesh, India. *International Journal of Current Microbiology and Applied Sciences* 2015;4(8):919-23.
10. Kumbhakar D, Talukdar PP. Cytopathological patterns of palpable breast lumps on fine needle aspiration- a hospital based study. J Evid Based Med healthc 2021;8(06): 319-326.
11. Khanzada TW, Samad A, Sushel C. Spectrum of benign breast diseases. *Pak J Med Science* 2009;25(2):265-68.
12. Kumar R, Ranjan A. Clinicopathological study and management of benign breast lesions. *International Journal of Contemporary Medical Research* 2017;4(12):1-4.
13. Madan M, Sharma M, Mannan R, Manjari M Kaur J, Garg S. Cytomorphological study of spectrum of breast lesions and determination of efficacy of FNAC in the diagnosis of various breast lesions. *Journal of evolution of Medical and Dental Sciences* 2015;4(55):9581-87.
14. Mitra S, Dey P. Grey zone lesions of breast: Potential areas of error in cytology. Journal of Cytology 2015;32:145-52.
15. Mohan BP, Krishnan SK, PH P, Jose L, Das NM, Feroze M. Correlation of fine needle aspiration cytology with histopathology in palpable breast lesions: A study of 200 cases from a tertiary care centre in south india. *Journal Of Medical Science and Clinical Research* 2018;06(07):936-42.
16. Modhia D, Agarwal S, Yadav P, Joshi A. A clinic-pathological study of benign breast disease at tertiary care centre. *Int Surg J* 2022;9:1210-4.
17. Nirmala C, Sejekan SV, Dayananda BS. Spectrum of benign breast lesions:A cytological study. *Journal of Evolution of Medical and Dental Sciences* 2015;4(54)::9305-12.
18. Nagger S, Bali I K, Arun P, Kumar V, Goyal K, Shah P et al. Clinico-pathological study on benign breast diseases in gurugram NCR. *"IOSR Journal of dental and medical sciences(IOSR-JDMS)* 2018;17(4): 59-62.
19. Ogbuanya AU, Anyanwn SNC, Nwigwe GC, Iyare FE. Diagnostic accuracy of FNAC for palpable breast lumps in a Nigerian teaching hospital. *Nigerian Journal of Clinical Practice* 2021;24:69-74.
20. Reddy K R, Poornima M M. Cytology and histopathology correlation of breast lesions. *Saudi Journal of Pathology and Microbiology. 2019;4(2):64-67.*
21. Rajkumar, Alok Ranjan. Clinicopathological study and management of benign breast lesions. *International journal of contemporary medical research 2017;4(12):1-4.*
22. Samal S, Swain PK, Pattnayak S. Clinical, pathological and radiological correlative study of benign breast diseases in a tertiary care hospital. Int Surg J 2019;6: 2428-32.
23. Sangma M M B, Panda K, Dasiah S. A clinico-pathological study on benign breast diseases. *Journal of clinical and diagnostic research,* 2013 ;7(3):503-506
24. Shilpa N, Shridevi S H. Cytological correlation of benign breast diseases with histopathology. *JMSCR*. 2016 : 4(10) 13256- 59.
25. Sharif A, Tabassum T, Riaz M, Akram M, Munir N. Cytomorphological patterns of palpable breast lesions diagnosed on fine needle aspiration cytology in females. *European Journal of inflammation*.2020;18:1-8
26. Shoba SN, Rajashekar YR. Role of FNAC in breast lesions. *Journal of Diagnostic pathology and oncology, 2017;2(1):3-5*
27. Shrestha A, Chalise S, karki S, Shakya G. Fine needle aspiration cytology in a palpable breast lesion. *Journal of pathology of Nepal* 2011;1:131-35.,
28. Sharma M, Gupta A, Kaul R. Cytological evaluation of breast masses during pregnancy and lactation: A retrospective analysis. *Global Journal of Reproductive Medicine 2017*:555594.
29. Singh A, Kumar S. Fine needle aspiration cytology: A reliable tool for diagnosis of spectrum of breast lesions in a tertiary care teaching hospital. *International Archives of Biomedical and Clinical Res*earch 2017;3(4):106-109.
30. Usman K, Nisar B, Sajid M: Diagnostic accuracy of fine needle aspiration cytology in a breast lump using histopathology as gold standard. *P J M H S 2015* ;9(1): 1