

## Research Article

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# Clinico-pathologic profile of women with palpable breast lumps in Chitwan Medical College, Nepal

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## ABSTRACT

**Background:** Spectrum of female breast diseases is manifold and includes various non-neoplastic and neoplastic conditions. This study focused on the clinico-pathological profile of several breast diseases, including fibrocystic change, fibroadenoma and breast carcinoma.

**Methods:** This cross sectional analytic observational study included Fine Needle Aspiration Cytology cases of female breast diseases diagnosed over three years from 2011 to 2014 in Chitwan Medical College Teaching hospital in Central Nepal. Univariate analysis was carried out to find out age group-wise proportion of the diseases in relation to five cytologic categories and various cytomorphologic diagnoses. Independent samples t-test was used to find out the significance of difference between mean age of benign and malignant breast diseases.

**Results:** The proportion of benign, suspicious for malignancy and malignant breast diseases was 90.4 %, 0.8% and 8.8 % respectively. The mean age of patients at diagnosis for benign diseases and malignant disease was  $31.7 \pm 10.4$  years and  $49.2 \pm 12.0$  years respectively. t-test showed difference in mean age between benign and malignant diseases to be statistically significant ( $t=8.79$ ,  $p < 0.001$ ). Fibrocystic change and fibroadenoma were the most common breast disease overall and the most common neoplasm respectively. 58.1 %, 25.9 % and 6.5 % of all carcinoma cases in this study were found below 50, below 40 and below 30 years of age respectively.

**Conclusions:** Fibrocystic change and fibroadenoma are most common disease of breast and most common neoplasm of breast respectively. Breast cancer occurs in younger women in Nepal in comparison to women in developed countries. Therefore, breast cancer prevention programs in Nepal should target young women also.

**Keywords:** Breast lump, Fibrocystic disease, Fibroadenoma, Breast cancer, Prevention, Nepal

## INTRODUCTION

Spectrum of breast diseases includes various non-neoplastic and neoplastic lesions. Non-neoplastic diseases include fibrocystic changes, pyogenic abscess, benign cysts, galactocele, mammary duct ectasia, subareolar abscess, acute and chronic mastitis, granulomatous mastitis and ductal epithelial hyperplasia. Neoplastic diseases of breast include fibroadenoma, lipoma, various types of adenomas and carcinoma.<sup>1</sup>

Fibrocystic changes (FCCs) constitute the most frequent benign disorder of the breast. Such changes generally affect premenopausal women between 20 and 50 years of age. Although many other names have been used to describe this entity over the years (including fibrocystic disease, cystic mastopathy, chronic cystic disease, mazoplastia, Reclus's disease), the term "fibrocystic change" is now preferred, because this process is observed clinically in up to 50 % and histologically in 90 % of women.<sup>2</sup>

Fibroadenoma is the most common benign tumor of the female breast. Most occur in women between ages of 20 and 40 years.<sup>1</sup>

Breast cancer is the most common malignancy in developed nations in women.<sup>1,3</sup> According to a multi-institution hospital-based cancer incidence data, breast cancer is the second most common cancer among women in Nepal.<sup>4</sup>

FNAC is the most common diagnostic modality done for breast lump after finding it on clinical breast examination (CBE) before further evaluation or operative treatment.<sup>5</sup> FNAC is simple, safe and quick procedure with high sensitivity and specificity.<sup>6,7</sup> The accuracy rate of FNAC in diagnosing breast cancer is up to 96%.<sup>8,9</sup>

When the result of three types of investigations of triple assessment concord, its diagnostic accuracy approaches 100 percent. Major objective of triple assessment of breast lumps, with FNAC as the most important component, is to find out whether a breast lump is benign or malignant so that further management can be planned accordingly.<sup>7,10</sup> However, because of logistics constraints, only FNAC and clinical acumen were used for the diagnosis of breast lumps of patients in this study. We hope information obtained from this study can be utilized for the management of breast lumps better and for the prevention of breast cancer. Prevention and early management of breast cancer in Nepal is important because a multi-institution hospital-based cancer incidence data revealed the cancer as the second most common malignancy among women in Nepal.

## METHODS

### Aim and objectives

The aim of this study was to analyze clinico-pathologic profile of women with different diseases of breast with following objectives: to find out age group-wise proportion of breast diseases, to find out mean age at diagnosis of breast diseases and to compare prevalence of breast diseases with the prevalence data of already published national and international work.

### Study design

This research was a cross sectional analytic observational study of FNAC cases carried out over three years from April, 2011 to March, 2014 in Chitwan Medical College Teaching Hospital in Nepal. FNAC procedure was performed following the standard protocol developed in compliance with internationally approved practice. The protocol explains the size of the needle to be used, methods of retrieving sample from lesion and staining techniques.<sup>11</sup>

### Data collection and analysis

Details of cases were retrieved from FNAC record registers. Only those cases which were rendered a diagnosis were included in the study. Cases which lacked sufficient

information about a patient and the lesion viz. age of patient, site of lesion and laterality (right breast or left breast) were excluded from the study. Diagnoses were categorized into five categories as recommended by European Breast Cancer Network (EBCN) Coordination Office, International Agency for Research on Cancer.<sup>12</sup>

- C1. Unsatisfactory
- C2 Benign
- C3. Atypia probably benign
- C4. Suspicious of malignancy
- C5. Malignant

Each category was further elaborated by cytomorphologic diagnosis. Those cases which were unsatisfactory for evaluation were subjected to a second FNAC. If the case could not be categorized in one of the categories C2 to C5 again, it was grouped in C1. On the contrary, if smears were satisfactory for evaluation, the case was grouped in one of the four categories C2 to C5.

Data from the questionnaires were entered into the Statistical Package for Social Sciences 20.0 (SPSS 20.0). Univariate analysis was performed for each variable using frequency distribution and means. Frequency of each breast lesion was tabulated. An independent samples t-test was carried out to find if there was any significant difference in mean age of women at diagnosis between benign and malignant breast diseases. Cross tabulation analysis was performed using Pearson Chi-square test between two types of related variables to find the strength of relationship between them. All statistical tests were performed using two-sided tests at the 0.05 level of significance (95 % confidence interval). Independent samples t-test was used to find out whether difference between mean age of patients at diagnosis for benign breast diseases and malignant breast diseases was statistically significant.

## RESULTS

Over three years, 383 patients had undergone FNAC for breast lesions in the hospital. After excluding 20 patients whose sufficient information was lacking in the record registers, total study population was 362. Even after second FNAC, smears were unsatisfactory for evaluation in nine cases. Therefore, definite cytological diagnosis could be rendered in 353 patients only. Cytological categories of breast diseases is presented in Table 1.

**Table 1: Cytologic categories of breast diseases.**

Category	Number of patients (percentage)
C1	9 (2.49)
C2	319 (88.12)
C3	0 (00.0)
C4	3 (0.83)
C5	31 (8.56)
Total	362 (100.0)

Mean age of patients who were rendered a diagnosis was 33.5 years. Mean age of patients at diagnosis for benign breast diseases and carcinoma was  $31.7 \pm 10.4$  years and  $49.2 \pm 12.0$  years respectively. Findings of independent samples t-test is presented in Table 2 which shows that the difference in mean age between benign and malignant diseases.

**Table 2: Comparison of mean age between benign and malignant diseases by independent samples t-test.**

Variable	Mean ( $\pm$ SD)	t- test value	P value
Malignant diseases	49.2 ( $\pm$ 12.0)		
Benign diseases	31.7 ( $\pm$ 10.4)	8.79	<0.001

Table 3 shows frequency of breast diseases overall and in different age-groups. The table shows the cytological spectrum of breast diseases. Pie diagram is used to supplement the same information. Most diseases were found in the age-group of 26 to 40 years.

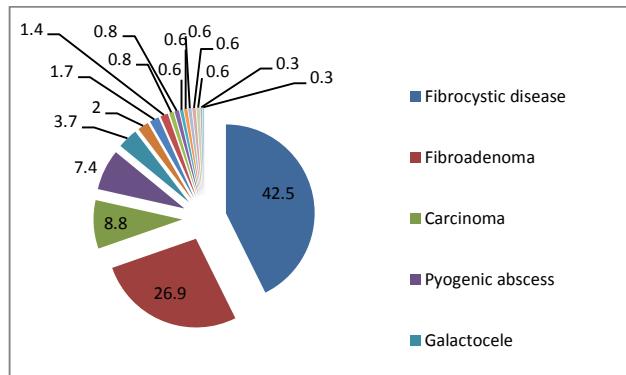
Fibrocystic change was the most common breast disease overall. Fibroadenoma was the most common neoplasm. Malignant neoplasms ranked third with most of the cases in the age-group of 41 to 55 years. No malignant neoplasm was seen in the age-group of 10 to 25 years.

Age-wise distribution of breast carcinomas is shown in Table 4. 58.1 %, 25.9 % and 6.5 % cases of breast carcinoma occurred before 50, 40 and 30 years of age respectively.

Carcinomas were more common in the right breast with 54.8 %. Fibrocystic disease was slightly more common in left breast with 45.3 % while fibroadenoma was slightly more common in the right breast with 50.5 %.

**Table 4: Age-wise distribution of breast carcinomas.**

Age group	Number of patients (%)	Cumulative percent
< 30	2 (6.5)	6.5
31 to 40	6 (19.4)	25.9
41 to 50	10 (32.2)	58.1
> 50	13 (41.9)	100.0



**Figure 1: Proportion of breast diseases.**

**Table 3: Frequency of breast diseases.**

Diagnosis	Age group of patients (%)				Total (%)
	10-25	26-40	41-55	>56	
Fibrocystic disease	35 (23)	90 (60)	24 (16)	1 (0.7)	150 (42.5)
Fibroadenoma	50 (52.6)	35 (36.8)	10 (10.5)	0 (0.0)	95 (26.9)
Carcinoma	0 (0.0)	8 (25.8)	15 (48.4)	8 (25.8)	31 (8.8)
Pyogenic abscess	9 (34.6)	9 (34.6)	6 (23.1)	2 (7.7)	26 (7.3)
Galactocele	7 (53.8)	6 (46.2)	0 (0.0)	0 (0.0)	13 (3.7)
Subareolar abscess	0 (0.0)	5 (71.4)	1 (14.3)	1 (14.3)	7 (2.0)
Benign cystic lesion	0 (0.0)	5 (83.3)	1 (16.7)	0 (0.0)	6 (1.7)
Lipoma	0 (0.0)	1 (20.0)	3 (60.0)	1 (20.0)	5 (1.4)
Mammary duct ectasia	1 (33.3)	0 (0.0)	1 (33.3)	1 (33.3)	3 (0.8)
Suspicious of malignancy	0 (0.0)	0 (0.0)	1 (33.3)	2 (66.7)	3 (0.8)
Chronic mastitis	1 (50.0)	0 (0.0)	1 (50.0)	0 (0.0)	2 (0.6)
Granulomatous mastitis	2 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.6)
Benign phyllodes tumor	0 (0.0)	2 (100.0)	0 (0.0)	0 (0.0)	2 (0.6)
Acute mastitis	2 (50.0)	2 (50.0)	0 (0.0)	0 (0.0)	4 (1.1)
Ductal papillomatosis	0 (0.0)	1 (50.0)	1 (50.0)	0 (0.0)	2 (0.6)
Ductal epithelial hyperplasia	0 (0.0)	1 (100.0)	0 (0.0)	0 (0.0)	1 (0.3)
Lactational adenoma	0 (0.0)	1 (100.0)	0 (0.0)	0 (0.0)	1 (0.3)
Total	107 (30.3)	166 (47.0)	64 (18.1)	16 (4.5)	353 (100.0)

## DISCUSSION

The usefulness of FNAC in breast pathology has been attested by this study on the basis of following facts: diagnostic material could be obtained in 97.51 % of patients, diagnosis of benign disease was given in 90.4 %, diagnosis of suspicious for malignancy was given in 0.8 % and diagnosis of malignant breast disease was given in 8.8 % of patients providing a clear platform for further management of the patients. In this study, fibrocystic change was found as the most common breast lesion with 42.5 % of the total lesions. Second most common was fibroadenoma with 26.9 % and the third most common was carcinoma of breast with 8.8 %. Two studies from Nepal have found fibrocystic change as the most common breast lesion.<sup>13,14</sup> While other studies from Nepal have found fibroadenoma as the most common breast lesion.<sup>15,16</sup> Studies from Lahore, Aurangabad and Mumbai have found fibroadenoma as the most common breast disease.<sup>17-19</sup> Two studies from Pakistan found carcinoma as the most common breast disease.<sup>20,21</sup> Authoritative text books and research published in a highly regarded scientific journal state that fibrocystic change is the most frequent disorder of the breast.<sup>22,23</sup> Fibrocystic changes affect premenopausal women between 20 and 50 years of age.<sup>24-26</sup> In this study, 93.3 % cases of fibrocystic change were found in that age group.

According to a book published by InTech and written by Talei *et al.*, peak incidence of fibrocystic breast disease occurs in the age-group of 35 to 50 years.<sup>27</sup> But, the proportion of patients with fibrocystic change in this age-group in our research was only 37.5 %. Mean age of patients for fibrocystic change in this research was  $32.9 \pm 8.9$ , which means it was found in younger age-group in this study.

Robbins and Cotran Pathologic Basis of Disease states that fibroadenoma is the most common benign tumor of the female breast.<sup>1</sup> According to the Oncologist, its peak is between the ages of 15 and 35 years.<sup>2</sup> In this research, fibroadenoma was found as the most common benign neoplasm and 78.9 % of all the neoplasms were found in that age-group. Essential Practice of Surgery states that peak incidence of fibroadenoma occurs between the ages of 21 to 25 years.<sup>28</sup> Mean age of patients with fibroadenoma in this research was  $27.4 \pm 8.6$  years. In all studies from Nepal, fibroadenoma was found as the most common benign neoplasm.<sup>13-16</sup> And as already mentioned, the neoplasm has been found to be even more common than fibrocystic change in some of those studies.<sup>15,16</sup>

In the developed countries, carcinoma of breast is the most common non-skin malignancy in women.<sup>1,27</sup> The proportion of breast cancers varied among the studies we came across, both national and international. In the present study, breast cancers comprised of 8.8 % of all the breast diseases. The figure varies from 6.6 % to 18.8

% in other national studies.<sup>13-16</sup> The value varies from 12% to 20% in studies from India, Pakistan and Bangladesh.<sup>17-20</sup> Average age at diagnosis of breast cancer was found to be  $49.2 \pm 12.0$  years in the present study. Singh *et al.*, also found mean age of breast cancer for Nepalese women to be lower ( $46.5 \pm 12.8$  years) in comparison to women in developed nations.<sup>29</sup> However, in another study from Nepal, mean age at diagnosis was 54 years.<sup>14</sup> Breast cancer has been seen to occur at a younger age group in other South Asian nations as well. A study from Bangladesh found it to be 44.3 years.<sup>30</sup> In India, a number of hospital-based studies found mean age to be 44.2 years to 49.6 years.<sup>31</sup> Mean age in Pakistani studies ranged from 45 to 50 years.<sup>32</sup> On the contrary, mean age of women with breast cancer in Australia at the time of diagnosis is 60 years.<sup>33</sup> According to Robbins and Cotran Pathologic Basis of Disease, in USA it is 61 years for white women, 56 for Hispanic women and 46 for African-American women. The same book states that only 20 % of non-Hispanic white women are diagnosed at ages younger than 50 years, in contrast with 35 % of African American women and 31 % of Hispanic women.<sup>1</sup> Findings of our study indicate that more cases of breast carcinoma occur in younger women in Nepal than in the developed nations. 58.1 % women below 50 years of age were diagnosed with carcinoma of breast in this study. 25.9 % and 6.5 % of all breast carcinoma cases in this study were found below 40 and below 30 years of age respectively. These findings are in stark contrast with the findings from the USA: Anders *et al.*, state that 6.6 % of all cases are diagnosed before age 40, 2.4 % are diagnosed before age 35, and only 1 % are diagnosed before age 30 in that country.<sup>34</sup>

It has been found that reproductive factors already proven to increase risk of breast carcinoma (nulliparity, early age at menarche, late age at menopause and late age at first full-term pregnancy) do not explain the earlier age of occurrence of the neoplasm in Nepalese women.<sup>35</sup> Family history of breast carcinoma in first degree relatives is also rare in Nepal.<sup>29,36</sup> So, "why breast cancer occurs in younger age-group in Nepal" is the question that needs to be answered.

Mammographic breast density differences does not exist across racial groups which means that mammogram cannot be used for women younger than 40 years for prevention of breast cancer in Nepal like in any other country.<sup>37</sup>

At present, there seems to be no alternative to the guidelines for the prevention of breast cancer which are recommended for women in developed countries even though the malignancy affects younger women in Nepal. But what can be done is to find out risk factors that predispose women to develop breast cancer at younger age in Nepal by carrying out large scale, well-designed prospective studies and address those factors in order to prevent the malignancy.

## CONCLUSIONS

Fibrocystic change was found as the most common breast lesion overall and fibroadenoma was found as the most common benign neoplasm in this study. Both these findings concord with international findings.

It was found in this study that breast cancer occurred in younger women in comparison to women in developed countries. Therefore, target population for health education to prevent breast cancer in Nepal should include young women also. And, while formulating "Breast Cancer Prevention Policy", the fact that breast cancer occurs in younger age-group in Nepal should be taken into consideration.

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