

BENIGN BREAST DISORDERS AND THEIR ASSOCIATION WITH THYROID DISORDERSEldo Varkey George¹, Jacob Jayakar Raju Mandapati², Ashwin Chand³¹Resident, Department of General Surgery, Pondicherry Institute of Medical Sciences, Pondicherry, Puducherry.²Associate Professor, Department of General Surgery, Pondicherry Institute of Medical Sciences, Pondicherry, Puducherry.³Associate Professor, Department of General Surgery, Pondicherry Institute of Medical Sciences, Pondicherry, Puducherry.**ABSTRACT****BACKGROUND**

The evidence that breast diseases and thyroid disorders are related is ever increasing. Many recent publications have highlighted the relation of breast cancer to hyperthyroidism. It has led to many institutions screening patients with breast cancer for thyroid disorders. We wanted to find the likelihood of patients with benign breast diseases having thyroid disorders.

METHODS

This was a case control study conducted in the Department of General Surgery, Pondicherry Institute of Medical Sciences, Puducherry during a period of 18 months from September 2016 to March 2018. Patients who were diagnosed to have breast lesions were categorized as case group (Group A) and patients without breast lesions as control group (Group B). Totally, 48 patients came under case group and 96 patients came under control group. All these patients underwent clinical and laboratory examination to determine their thyroid function status and other thyroid dysfunction that they might have.

RESULTS

70.8% of the patients in the case group were categorized as BIRADS category II on mammogram and 29.2% were categorized as BIRADS category III. The most common breast benign disease seen among the patients in our case group was fibroadenosis (60.4%) followed by fibroadenoma (35.4%). Thyroid dysfunction was present in 62.5% and 8.33% of the case and control groups respectively. In the case group, 62.5% of the patients were hypothyroid and 37.5% were euthyroid. In the control group, 6.25% of the patients were hypothyroid and 91.67% were euthyroid.

CONCLUSION

A patient with a benign breast disease was 18 times more likely to be having thyroid dysfunction as compared to a patient in the control group and this association was found to be statistically significant (p-value<0.01). Also, a patient with benign breast disease was 24 times more likely to be having hypothyroidism as compared to a patient in the control group and this association was found to be statistically significant (p-value<0.01).

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BACKGROUND

Benign breast disease is the most common cause of breast problems in females. It is more frequent than malignancy of breast.¹ It is 10 times more common than breast cancer in the west. Prevalence has ranged from 16 to 50% in various reports.^{2,3,4}

Thyroid disorders are among the most common endocrine diseases in India.⁵ The prevalence of thyroid disorders is more common in women than in men.⁶ Studies have suggested an increased prevalence of thyroid disorders in women with benign breast disorders. Various endocrine and non-endocrine theories on the aetiology of benign breast disease have been proposed.⁷ The vast majority of the lesions that occur in the breast are benign. The

commonest age group which is affected is the 21-30 years age group.⁸ The total burden of thyroid disorders in India is 42 million.⁵ In a study conducted in Pondicherry on 505 subjects in the age group of 20-80 years, 15.8% had thyroid dysfunction and 84.2% were euthyroid.⁹

After the demonstration of sodium iodide symporter (NIS) activity in breast tissue, it was understood that at certain stages of life, breast epithelium is actively involved in iodine uptake and concentration.¹⁰ Most of the published work has focused on the relationship between breast cancer with thyroid disease despite the fact that the prevalence of benign breast disease is far more common than breast cancer. An increased prevalence of thyroid disorders in women with benign breast disorders was seen in some studies.

METHODS

This is a case-control study of 18 months duration from September 2016 to March 2018. For an anticipated odds ratio of 6, with a 1:2 allocation of case and control, the sample size required for the case group was 48 and the control group was 96. To achieve the alpha power of 80% and a significance level of 5%.

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Case

Inclusion Criteria

- All female patients found to have benign breast disease.
- Age between 18 and 70 years.

Exclusion Criteria

- All diagnosed cases of breast malignancy.

Control

- All female patients between the age of 18 and 70 years without any breast diseases.

Investigations Used

- TSH
- Ultrasound breast
- Mammogram

Methodology

- All patients were evaluated by a thorough History and clinical examination of both breasts. If they were found to have breast lesions, they were evaluated further with mammogram or ultrasound of breast. In case there was no palpable clinical lump, but if the patient complained of breast pain or nipple discharge or heaviness, mammo-sonogram was done.
- If they were found to have breast lesions either clinically and/or by mammo-sonogram, they were included in the case group and if they didn't have breast lesions on clinical examination, they were included in the control group.
- TSH was evaluated for all patients, who were involved in the study (case and control) and the patients were categorized as hypothyroid, hyperthyroid and euthyroid based on their TSH levels.
- TSH levels of serum samples were analysed using the 3rd generation Chemiluminescence immunometric assay kits (Diagnostic Product Corporation (DPC), Los Angeles, USA) on the Immulite 1000 Chemiluminescence Analyser. The analytical sensitivity was 0.004 μ IU/ml. All sera samples were stored -20°C. The laboratory's reference value was TSH (0.4 – 4.0 μ IU/ml).
- The patients with TSH values < 0.4 μ IU/ml, >4.0 μ IU/ml and between 0.4 – 4.0 μ IU/ml were classified as being hyperthyroid, hypothyroid and euthyroid respectively.

RESULTS

In the present study, 81% of the patients were from the 17-25-year age group, 46% were from the 26-40-year age group and 17% were more than 40 years old. (Figure 1)

60.4% of the patients in the case group had breast lumps and 39.6% had no lump but showed findings on mammo-sonogram. (Table 1)

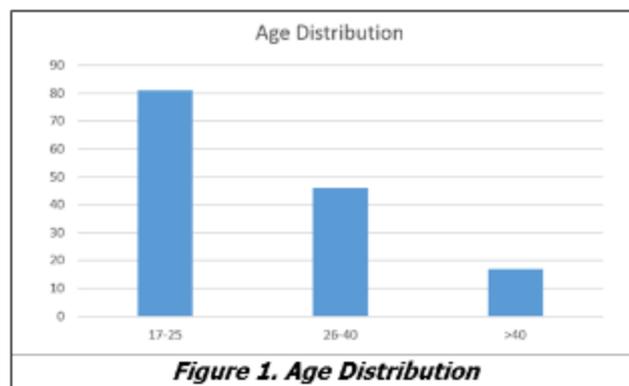


Figure 1. Age Distribution

Breast Lump	Number	Percent
Absent	19	39.6
Present	29	60.4
Total	48	100

Table 1. Distribution of Patients in the Case Group Showing Breast Lump

In our study, 40(83.3%) of the patients in the case group had breast pain and 8(16.7%) had no pain whereas 47(97.9%) of the patients in the case group had no complaints of nipple discharge and 1(2.1%) had nipple discharge. (Figure 2)

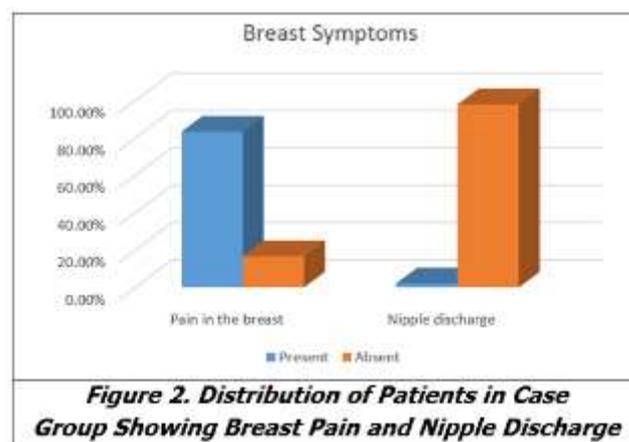


Figure 2. Distribution of Patients in Case Group Showing Breast Pain and Nipple Discharge

The Number of patients in BIRADS category II were 34 (70.8%) and the rest 14(29.2%) were in category III. (Figure 3)

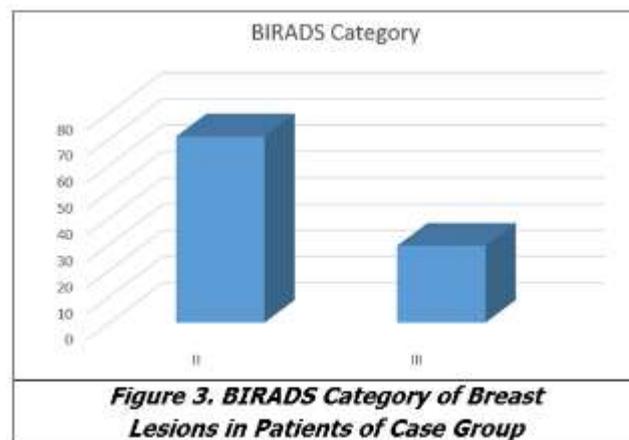


Figure 3. BIRADS Category of Breast Lesions in Patients of Case Group

29(60.4%) of the patients in the case group were found to have fibroadenosis. Fibroadenoma and duct ectasia were found in 17(35.4%) and 2(4.2%) of the patients respectively. (Figure 4)

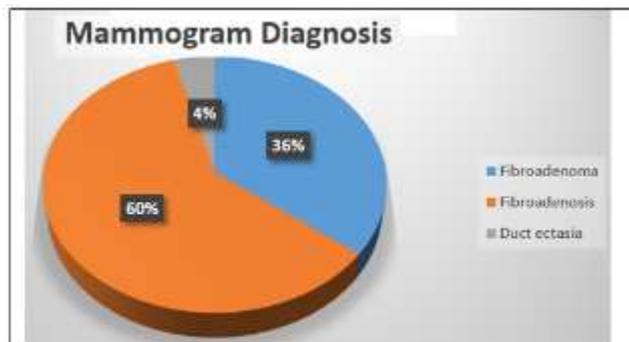


Figure 4. Distribution of Patients in The Case Group Based on Mammogram Findings

23.53% of the patients with fibroadenomas were from the age group of 18-25 years. 41.18% and 35.29% were from the age groups of 26-40 years and above 40 years respectively. 17.24% of the patients with fibroadenosis were from the age group of 26-40 years, 82.76% were above the age of 40 years and there were no patients from the 18-25 years age group. Of the patients with duct ectasia, 50% were from the 26-40 years age group and the other 50% were from the above 40 years age group. There is a statistically significant association between breast diseases and age group. (Table 2)

Age Group	Benign Breast Disease			Total
	Fibroadenoma	Fibroadenosis	Duct Ectasia	
18-25	4 (23.53%)	0 (0%)	0 (0%)	4
26-40	7 (41.18%)	5 (17.24%)	1 (50%)	13
>40	6 (35.29%)	24 (82.76%)	1 (50%)	31
Total	17	29	2	48

Table 2. Distribution of Breast Diseases in The Case Group According to Age

Among the patients who were euthyroid, 13.21%, 31.13% and 55.66% were from the age groups 18-25 years, 26-40 years and above 40 years respectively. Among the patients who were hypothyroid, 8.33%, 33.33% and 58.33% were from the age groups 18-25 years, 26-40 years and above 40 years respectively. Among the patients who were hyperthyroid, 50% were from the 26-40 years age group and 50% were above the age of 40 years. There is no statistically significant association between thyroid status and age group. (Table 3)

Age Group	Thyroid Status			Total
	Euthyroid	Hypothyroid	Hyperthyroid	
18-25	14 (13.21%)	3 (8.33%)	0 (0%)	17
26-40	33 (31.13%)	12 (33.33%)	1 (50%)	46
>40	59 (55.66%)	21 (58.33%)	1 (50%)	81
Total	106	36	2	144

Table 3. Distribution of Thyroid Disorder According to Age

In the patients with breast diseases, among the euthyroid cases, 5.56%, 27.78% and 66.67% were from the age groups 18-25 years, 26-40 years and above 40 years respectively. Among the patients who were hypothyroid, 10%, 26.67% and 63.33% were from the age groups 18-25 years, 26-40 years and above 40 years respectively. None of the patients with breast diseases were found to be hyperthyroid. There is no statistically significant association between thyroid status and age group. (Table 4)

Age Group	Thyroid Status			Total
	Euthyroid	Hypothyroid	Hyperthyroid	
18-25	1 (5.56%)	3 (10%)	0 (0%)	4
26-40	5 (27.78%)	8 (26.67%)	0 (0%)	13
>40	12 (66.67%)	19 (63.33%)	0 (0%)	31
Total	18	30	0	48

Table 4. Distribution of Thyroid Disorder According to Age Among Patients with Breast Diseases

A patient of case group is 18 times more likely to be having thyroid dysfunction as compared to a patient in control group and this association was found to be statistically significant (p-value <0.01). 62.5% of the patients in control group had thyroid dysfunction as compared to only 8.33% in the control group. A patient of case group is 24 times more likely to be having hypothyroidism as compared to a patient in the control group and this association was found to be statistically significant (p-value <0.01). A patient with breast disease is more likely to have hypothyroidism than a person without breast disease. In the

case group, 62.5% of the patients were hypothyroid and 37.5% were euthyroid. In the control group, 6.25% of the patients were hypothyroid and 91.67% of the patients were euthyroid. (Table 5)

Thyroid Status	Case Group	Control Group	Total
Thyroid Dysfunction	30 (62.5%)	8 (8.33%)	38
Euthyroid	18 (37.5%)	88 (91.67%)	106
Total	48	96	144

Table 5. Distribution of Patients with Thyroid Dysfunction in The Case and Control Groups

The most common breast disease seen among the patients in our case group was fibroadenosis followed by fibroadenoma. 20 hypothyroid and 9 euthyroid patients were found to have fibroadenosis. Majority of the patients with fibroadenosis were above the age of 40 years. Among the euthyroid group, there is no statistically significant association between breast diseases and age group (p value=0.4017; Yate’s corrected chi-square test; Degree of freedom=1).

Among the hypothyroid group, there is a statistically significant association between breast diseases and age group (p value=0.0082; Yate’s corrected chi-square test; Degree of freedom=1. (Table 6)

Thyroid Status			Breast Disease			Total
			Fibroadenoma	Fibroadenosis	Duct Ectasia	
Euthyroid	Age Group	18-25	1	0	0	1
		26-40	3	2	0	5
		>40	4	7	1	12
	Total		8	9	1	18
Hypothyroid	Age Group	18-25	3	0	0	3
		26-40	4	3	1	8
		>40	2	17	0	19
	Total		9	20	1	30
Total	Age Group	18-25	4	0	0	4
		26-40	7	5	1	13
		>40	6	24	1	31
	Total		17	29	2	48

Table 6. Distribution of Breast Diseases and Thyroid Status According to Age Among The Case Group

DISCUSSION

This present study was done to find an association between benign breast disorders and thyroid disorders. The case group had 48 patients who were all diagnosed cases of benign breast disorder through clinical examination and mammogram. The control group consisted of 96 patients who were clinically examined and not found to have any breast disorders. TSH level was measured for all patients.

In the control group, 91% of the patients were found to be euthyroid, 2% were hyperthyroid and 7% were found to be hypothyroid. Similar results were also observed in a study conducted in the same population and geographic location by Abraham et al where they found that of the total 505 women examined, 15.8% had thyroid dysfunction and 84.2% were euthyroid.⁹

An Indian study conducted by Hiremath et al reported benign breast disorders to occur in 57.8% of all patients who came with breast symptoms.¹¹ The case group were diagnosed cases of benign breast disorder on basis of clinical and radiological examination, out of which fibroadenoma was 35.4%, fibroadenosis was 60.4% and duct ectasia was 4.2%. Similar results were also observed in a study conducted in the same population and geographic location by Mima et al where they found that out of the 100 female patients who were studied, 87 patients who presented with

breast lumps and fibroadenoma, accounted for 48% of the cases. Fibrocystic changes and breast abscesses came next with 18% and 12% cases respectively.⁸

The radiological investigation in the study population following BIRADS system, 70.8% of the study population were categorized under BIRADS II and 29.2% were categorized under BIRADS III.

The thyroid status of the case group showed varied thyroid status. 37% of the case group were euthyroid and 73% hypothyroid, no case of hyperthyroidism were identified in the case group. All the patients who were found to have abnormal TSH were referred to an endocrinologist for further evaluation and management of their thyroid condition.

Dimitri et al observed in their study higher percentage of enlarged thyroid glands were found in groups of benign breast disease when compared to women with no breast diseases.¹² The association of benign breast disease and hypothyroidism were found to be statistically significant by Panchagan et al.¹³ They observed that the overall prevalence of hypothyroidism was 23.2% in patients with benign breast diseases and benign breast disorder symptoms were alleviated in 83% of the hypothyroid patients with only thyroxine replacement. Identical conclusions were drawn in

studies by Humprey LJ et al and Backwinkel et al that hypothyroidism is associated with breast disease.^{14,15}

CONCLUSION

A patient with a benign breast disease was 18 times more likely to be having thyroid dysfunction as compared to a patient in the control group and this association was found to be statistically significant (p -value <0.01). Also, a patient with benign breast disease was 24 times more likely to be having hypothyroidism as compared to a patient in the control group and this association was found to be statistically significant (p -value <0.01).

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