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PREVALENCE OF THYROID DISEASE ALONG WITH BREAST CANCER

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ABSTRACT

Some authors have observed a higher prevalence of AITDs in BC patients compared to age-matched controls; thus, this association is not new. Some studies have found that the presence of TPO antibodies is associated with a significantly better outcome among BC patients and that this improvement is comparable to that seen with other prognostic indices such as axillary node status and tumor size, though the exact significance of this association is unclear.Therefore, the purpose of this study was to assess TD with BC in relation to the female population. All cases that meet the inclusion criteria will be considered after receiving approval from the IEC. The demographic characteristics, clinical, medical, social, and family H/O were documented using a semi-structured, standardized, and pre-validated case record. In addition, a comprehensive and systematic evaluation was conducted on all patients diagnosed with breast cancer. This evaluation included clinical, radiological, and laboratory screenings, involving a total of 69 patients. In our study, we found that the occurrence of abnormal TFT results was more frequently linked to cases of BC in comparison to the control group. The data was analyzed using the Chi-square test, which yielded a highly statistically significant result with a p-value of 0.0006. The findings of our study demonstrate a substantial correlation between BC and TD. Further investigation is necessary to validate this correlation.

Keywords: BC, TD, TPO, AITDs, antibodies, TFT, prognostic indices, correlation , tumor size.

INTRODUCTION

Researchers concluded that, about 1 million women globally will be affected by BC, making it the most common MT among women. No clinically significant risk factors for BC have been identified outside of genetics, lifestyle, reproductive and endocrine systems. The usual prognostic markers are the tumor's size, histopathological type, lymph node involvement, grading, hormone receptor type, and Her/2-neu status. In comparison to healthy controls, a high percentage of women with BC test positive for antibodies to thyroid peroxidase(T-EPO) at an early age. Thyroid autoimmune alterations have been linked to BC prognostic factors in several studies. Recent studies suggest that 10.0-19.7% of patients with BC have elevated levels of thyroid-stimulating hormone (TSH) in their serum, indicating that they have either subclinical or apparent hypothyroidism.[1,2,3]

Many studies have shown that thyroid diseases are common in women with breast cancer; however, other reports have not shown such an association. The association between breast cancer and almost every type of thyroid disorder, including nodular hyperplasia, hyperthyroidism, and TC, has been established. These findings prompted researchers to look into the relationship between breast cancer and autoimmune thyroid diseases (AITDs). This relationship is not new, as some writers have observed a higher prevalence of AITDs among breast cancer patients than in age-matched control individuals. The precise significance of this association is unknown, but some reports have found that the presence of thyroid peroxidase (TPO) antibodies is associated with a significant improvement in outcome among breast cancer patients, and is comparable to other prognostic indices like axillary nodal status and tumour size.[4,5,6] Hence, the goal of our study was to evaluate TD with BC as compared with the female population.

AIM

To determined prevalence of thyroid disease(TD) in patients with breast cancer (BC) as compared with female population.

INCLUSION CRITERIA

1. BC patinets between 38-80 years old.
2. Before starting chemotherapy.
3. Before starting hormone therapy.
4. Before starting radiotherapy.

EXCLUSION CRITERIA

1. Already diagnosed TD patients.
2. Benign starting radiotherapy.

MATERIALS & METHOD

We conducted a prospective, observational study in the department of general surgery in KH&MRC, Karad , for 18 months starting from December 2017 ending from July 2019 with total of 69 patients.

METHOD

All cases fullfilling the inclusion criteria, after approval of IEC . The demographic character, clinical, medical,social & family H/O was recorded withhelp of semi-structured , standard, pre-validated case record . Furthermore, general, systemic examination were done and all patients diagnosed BC were screened for TD clinically, radiologically & by laboratory.

COLLECTION OF DATA

Informed onsent obtained from all patients . Demographic character, clinical H/O, past medical H/O, family H/O & social H/O were recorded with help of standard, semi-structured ,pre-validated case record.

STATISTICAL ANALYSIS

The data collected was inputted using the Microsoft Excel spreadsheet software, specifically version 2016. The analysis was conducted using IBM SPSS version 22.0 software. Parametric tests of significance were employed to analyze the distributed variables. In addition, the association between categorical and nominal variables was assessed using a non-parametric test, specifically the Chi-square test.

RESULT

Age group (in years)	Number of cases	Percentage
<40	**10**	**14.49**
41-50	**23**	**33.33**
51-60	**15**	**21.73**
61-70	15	21.73
>70	6	8.69
Total	69	100
Mean age ± SD	54.21 ± 12.48 years	

Table 1: Age-wise distribution(case group)

In our study, we found that, the majority of the patients belonged to groups 41–50 with 33.33%, followed by 51–60 and 61–70 years with 21.73%, respectively. Hence, the mean age was 54.21±12.48 years.

Age group (in years)	Number of controls	Percentage
<40	29	42.02
41-50	11	15.94
51-60	6	8.69
61-70	18	26.08
>70	5	7.24
Total	69	100
Mean age ± SD	50.39 ± 14.46 years	

Table 2: Age-wise (Control group)

In our study, we found that the majority of the patients belonged to the age group of less than 40 years (42.02%), followed by 61–70 years (26.08%) in each group. Hence, the mean age was 50.39±14.46 years.

Type of carcinoma	Number of cases	Percentage
Invasive ductal	54	78.26%
Invasive lobular	9	13.04%
Mixed type	6	8.69%
Total	69	100%

Table 3: Distribution of caese according to type of BC

In our study we found that, majority of the patients had invasive ductal carcinoma (78.26%), followed by invasive lobular type of carcinoma (13.04%)& 8.69% had mixed type of BC.

TFT results	Number of cases	Percentage
Hypothyroidism	7	10.14
Hyperthyroidism	6	8.69
Normal	56	81.15
Total	69	100

Table 4: Distribution of BC according to results of TFT

In our study, we found that the prevalence of hypothyroidism observed among BC was 10.14%, whereas hyperthyroidism was up to 8.69%. Hence, the total prevalence of TD among BC cases was reported to be 18.84%.

TFT results	Number of controls	Percentage
Hypothyroidism	1	1.44
Hyperthyroidism	1	1.44
Normal	67	97.10
Total	69	100

Table 5: Distribution control according to result of their TFT

In our study, we found that the prevalence of hypothyroidism observed among the control population was 1.44%, whereas hyperthyroidism was 1.44%. Hence, the total prevalence of TD among controls was 2.88%.

USG neck results	Number of cases	Percentage
Positive	4	5.79
Normal	65	94.20
Total	69	100

Table 6: Distribution of cases (USG neck)

In our study, we found that 5.79% of cases had positive USG findings.

FNAC neck results	Number of cases	Percentage
Positive	2	2.89

Normal	67	97.10
Total	69	100

Table 7: Distribution of cases (FNAC neck)

In our study, we found that 2.89% of cases had positive FNAC neck results.

USG neck results	Number of controls	Percentage
Positive	0	0
Normal	69	100
Total	69	100

Table 8: Distribution of control (USG neck)

In our study we have found that, no positive results were seen for USG neck.

FNAC neck results	Number of controls	Percentage
Positive	0	0
Normal	69	100
Total	69	100

Table 9: Distribution of control (FNAC neck)

In our study we found that, no positive results were seen for FNAC neck.

Type of thyroid abnormality	Number of cases	Percentage (outof all cases)	Percentage (Among thyroid dysfunction)
Nodular goitre	3	4.34%	30.76%
Diffuse goitre	1	1.44%	7.69%
Sub-clinical disease	9	13.03%	69.23%
Total	13	18.84%	100%

Table 10: Distribution of cases according to type of goitre present

In our study, we found that the majority of the cases with thyroid dysfunction were associated with subclinical disease (13.03%), followed by 4.34% of cases with nodular type of goiter and 1.44% of cases with diffuse type of goiter. When compared within the group (thyroid dysfunction), 7.69% had diffuse goiter, 30.76% had nodular goiter, and 69.23% had subclinical thyroid dysfunction.

TFT Vs Breast cancer		BREAST CANCER		Total
		CASES	CONTROLS	
TFT	**Abnormal**	13	2	15
	Normal	56	67	123

Total	69	69	138
Significance	**Chi-square value: 7.47, p-value: 0.0006**		

Table 11: Comparison of TFT (cases & control)

In our study we have found that, the occurrence of abnormal TFT results was found to be more frequently linked to cases of BC in comparison to the control group. The data was analyzed using the Chi-square test, which yielded a highly statistically significant result as p-value = 0.0006.

DISCUSSION

The majority of cases in the present study belonged to the age group of 41 to 50 years (33.33%), followed by 51 to 60 and 61 to 70 years (21.73% each). The cases in the present study had a mean age of 54.21 12.48 years. In the present study, the majority of controls belonged to the present age group of less than 40 years (42.02%), followed by those between 61 and 70 years (26.08% each). Cases in the present study had a mean age of 50.39 ±14.46 years.

Authors	Mean age ± SD
Current study	54.21 ± 12.48 years
OrhanTurken et al[7]	63 years
Mohammad Reza Motie et al[8]	46.6 ± 11.27 years
Nagi B. Kumar et al[9]	50.65 ± 10.59 years

Table 12: Mean age comparative studies

Distribution of cases according to type of carcinoma

In the present study, we classified the study cases according to the type of breast carcinoma diagnosed. The majority of the cases had invasive ductal carcinoma (78.26%), followed by invasive lobular carcinoma (14.04%), and 8.69% had mixed-type breast carcinoma.

Authors	Types of carcinoma		
	Ductal	**Lobular**	**Mixed**
Current study	78.26%	13.04%	8.69%
OrhanTurken et al[7]	79%	10%	11%
Mohammad Reza Motie et al[8]	72.1%	1.2%	26% (DCIS)

Table 13:Distribution of case

Prevalence of Thyroid Abnormality (cases)

The current study found a prevalence of 10.14% for hypothyroidism among BC cases, while hyperthyroidism was reported to have a prevalence of 8.69%.The overall prevalence of TD among BC cases was reported to be 18.84%. The current study found a prevalence of 1.44% for hypothyroidism among the control population, while hyperthyroidism was reported to have the same prevalence of 1.44%.The overall prevalence of TD among the control group was found to be 2.88%. According to a study by Orhan Turken et al., 4% of cases showed

hyperthyroidism, while 3% of patients showed hypothyroidism.[7] In a study conducted by Nagi B. Kumar et al., it was found that the prevalence of mild or overt hypothyroidism in breast cancer patients in the US was 15.4%. This percentage was observed to be higher compared to the prevalence in Indian breast cancer patients.[9]

Ultrasonography of neck

Ultrasonography of the neck was performed to evaluate the symptomatic cases. A total of 5.79% of the cases in our study exhibited positive findings on USG. In contrast, a total of 2.89% of cases exhibited positive findings in the neck region through FNAC. No cases were found in which the controls exhibited positive results for USG or FNAC. In this study, the case group was classified based on the specific thyroid abnormalities observed (type of goiter). The findings revealed that the majority of cases with TD were linked to subclinical disease, accounting for 13.03% of the cases. This was followed by 4.34% of cases with nodular goiter and 1.44% of cases with diffuse goiter. Among the group of individuals with TD, the diffuse type of goiter was observed in 7.69% of cases, while nodular goiter was present in 30.76% of cases. The remaining 69.23% of cases exhibited subclinical TD.

Comparison of TFT (case & control)

In this study, a comparison was made between the thyroid function test results of cases and controls. It was observed that breast cancer cases had a higher prevalence of abnormal thyroid function test results compared to controls. The data was analyzed using the Chi-square test, which yielded a highly statistically significant result with a p-value of 0.0006. In anothe study, they came to the conclusion that there was a significantly increased risk of BC. After stratification by age group (age 45, 45-55, and >55 years), patients with hypothyroidism also had an increased risk of thyroid cancer without statistical significance.[10]

CONCLUSION

The study findings indicate that the average age of the cases included in this research was 54.21 ± 12.48 years. This observation is primarily attributed to the prevalence of invasive ductal carcinoma among the cases. In addition, a study found that the occurrence of hypothyroidism among individuals with breast cancer was 10.14%, while the prevalence of hyperthyroidism was reported to be 8.69%. The overall prevalence of TD among BC cases was reported to be 18.84%. The patients with BC exhibited a significantly higher incidence of nodular goiter. Furthermore, the BC patients displayed abnormal characteristics in their thyroid glands when compared to the control group. The findings of our study demonstrate a substantial correlation between BC and TD. Further investigation is necessary to validate this correlation.

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