SERUM ANTI – TPO LEVELS IN BENIGN AND MALIGNANT BREAST TUMORS

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ABSTRACT

Breast cancer is a hormone dependent neoplasm. Conflicting results regarding the clinical correlation between breast cancer and thyroid diseases have been reported. The objective of this study was to determine the association of anti – TPO levels in patients having complaints of a lump in breast. Serum samples and Fine needle aspiration cytology (FNAC) samples were collected from 31 female patients with a lump in breast between the age group of 20 – 75 years. 31 age matched normal healthy controls were also examined for the same parameters. Serum samples were analyzed for its anti – TPO levels. FNAC reports confirmed patients as having duct cell carcinoma. They had raised serum anti – TPO levels compared to controls. FNAC results of others (n=26) were reported as fibroadenoma whose anti – TPO levels were less than the controls.

KEY WORDS

anti – TPO, FNAC, Breast cancer.

INTRODUCTION

Breast cancer is one of the commonest causes of death in many developed countries in middle aged women and is becoming frequent in developing countries. The incidence of breast cancer varies between urban and rural women. The number of breast cancer cases is estimated to have reached 1.2 million world wide. Geographical variations in the incidence of breast cancer have been attributed to differences in dietary iodine intake (1). An association between autoimmune thyroid disease and breast carcinoma were reported (2,3), but this was not confirmed in other studies (4). Higher frequency of thyroid peroxidase antibodies (TPO Ab) in breast carcinoma patients, compared with control groups were also reported (5) and more recently, it has been demonstrated (6) that there was an overall increased prevalence of both thyroid disorders and TPO Ab in patients with breast carcinoma (7). An effect of iodine on the breast tissue has also been postulated (8, 9). The possible interactions between thyroid gland and breast

tissue are based on the common property of the mammary and thyroid epithelial cell to concentrate iodine by a membrane active transport mechanism as well as on the presence of TSH receptors in fatty tissue, which is abundant in mammary gland (10, 11).

This area of endemic fluorosis has a high incidence of subclinical hypothyroidism (2-10%). This geographical area has also a very high incidence of breast cancer (16.2%). The drinking water level of fluoride is 5.2ppm in this area. The aim of this study was to determine the serum anti – TPO levels in patients with duct cell carcinoma and fibroadenoma lesions of the breast.

MATERIALS AND METHODS

The present study group (n=31) included patients from a village named Narketpally, Nalgonda Dist. A detailed history regarding the intake of iodised salt as well as family history was taken. Most patients belonged to low socio-economic status group. Demographic details are given in Table 1. Fine needle aspiration cytology (FNAC) was done for all the patients to diagnose the type of growth. In all patients diagnosis was histologically or cytologically proven and type of malignancy was invasive ductal carcinoma. The patients were recruited before any treatment (chemotherapy, radiotherapy or surgery) was initiated. At the first admission patients were divided into two groups according to presence or absence of distant organ

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Table 1: Demographic details of controls and patients

Parameters	Controls	Patients
Number	31	31
Age (Range in Years)	30-65	20-75
Gender	Female	Female
Parity: Nulliparous	Nil	Nil
Duration of symptoms (Months)	Nil	6months – 2 years
Family history of Cancer	NS	1
History of Thyroid disease or goiter	NS	1/31:3.2%

NS – Not significant

metastasis The control population was age and sex matched persons who came for a general check up to the hospital. Venous blood (5 ml) was also collected for estimating anti – TPO levels. Anti – TPO was determined on ELECSYS 1010 using the principle of electrochemiluminescence. The iodine levels was analysed in drinking water of this region and was found to be normal.

Data was expressed as mean $\pm$ SD. Statistical analysis was done by using paired 't' test. P - value less than 0.05 was considered to be significant.

RESULTS AND DISCUSSION

FNAC reports confirmed 5 patients having duct cell carcinoma and 26 with fibroadenoma. Table 2 shows the anti TPO levels in patients and controls. The mean values for serum anti-TPO were significantly high in patients confirmed as duct cell carcinoma than in control groups ($p < 0.001$) and is less in fibroadenoma patients (benign lesions) compared to controls ($p < 0.001$).

Table2: Serum anti-TPO levels in patients and controls

	Serum anti TPO (IU/L)
Duct cell carcinoma(n=5)	59.6 $\pm$ 9.37
Fibroadenoma (n=26)	7.55 $\pm$ 3.62
Control (n=31)	14.99 $\pm$ 7.74

Values are mean $\pm$ SD

Thyroid profile was done in patients and controls Table 3 shows the mean values of thyroid profile. Moreover, FNAC reports confirmed as Duct cell carcinoma belong to age group of 45-65 years. As age advances, reduced dietary iodine intake are associated with raised anti-TPO levels and abnormalities in breast tissue. Thyroid function, thyroid

Table 3: Thyroid profile in patients and control (mean $\pm$ SD)

Thyroid profile (n=31)	Patients	Control
TSH (mIU/L)	3.34 $\pm$ 1.30	2.32 $\pm$ 1.20
T ₄ (μ gm/dl)	8.93 $\pm$ 3.7	9.35 $\pm$ 4.2
T ₃ (ng/ml)	1.73 $\pm$ 0.65	1.62 $\pm$ 0.58

antibodies and clinically relevant thyroid diseases were investigated in several patients with breast carcinoma (2, 3, 10, 11). Some endocrine stimuli identified in thyroid products that exert a simultaneous action on the breast and the various thyroid antibodies, which could also interact with receptors on breast tumors, have been postulated to be responsible for the coincidence of mammary and thyroid gland disorders (12, 13).

In our study we have shown higher levels of anti TPO in patients with duct cell carcinoma when compared with fibroadenoma and controls. Higher frequency of thyroid peroxidase antibodies (TPOAb) in breast carcinoma patients, compared with controls, has been reported and it has been demonstrated that there was an overall increased prevalence of both thyroid disorders and TPO Ab in patients with breast carcinoma (6, 7, 8).

It has been proposed that the presence of thyroid abnormalities may influence breast cancer progression. Smyth et al. suggested a better prognosis for breast cancer among patients with increased levels of TPO (7). Although high TPO levels have been shown to be a very important in antibody dependent cell cytotoxicity in thyroid, there may be a possible association between autoimmune thyroiditis and the immune system. Studies report no agreement on the significance of its association with breast cancer.

Anticarcinogenic role for iodine in experimental animals was suggested by the Funhashi & coworkers (15), who found that administration of lugol's iodine or iodine-rich Wakame seaweed to rats treated with the carcinogen dimethylbenzanthracene suppressed the development of mammary tumors. In further study (16), the same group demonstrated that seaweed induced apoptosis in human breast cancer cells with greater potency than that of flurouracil, a chemotherapeutic agent used to treat breast cancer. This finding led the authors to speculate that seaweed may be applicable for prevention of breast cancer (15, 16). In conclusion, thyroid functions of these patients should be monitored. Further studies are required to confirm the association of breast related abnormalities, increased anti-TPO levels and age. From this study we can conclude that there is a possible association between age,

reduced dietary iodine intake, raised anti-TPO levels and abnormalities of breast tissue. Further studies are required to confirm its association.

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