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Synchronous malignancies of breast and thyroid gland: A case report and review of literature

ABSTRACT

The relationship and coincidence of breast cancer with thyroid disorders is a subject of extensive debate and controversy. Many studies have shown that thyroid diseases are common among women with breast cancer. We present a case of concomitant malignancy of breast and thyroid with review of literature on the association of breast with thyroid neoplasm. The potential association and plausible mechanisms of breast carcinoma development after or before the thyroid carcinoma should be evaluated in larger cohorts of patients.

KEY WORDS: Breast, concomitant malignancy, thyroid

CASE REPORT

A 50-year-old postmenopausal female with complaints of lump in left breast and burning sensation in left axilla sought medical consultation in April 2006. On examination a lump of 2 × 2 cm in size in upper inner quadrant of left breast was found. Fixed, firm to hard lymphnodes were palpable in left axilla. A 4 × 3 cm in size, firm to hard lymph node was palpable in left supraclavicular region. Mammography revealed an ill-defined mass with faint micro calcifications in deep central inner quadrant and enlarged lymphnodes in left axilla. FNAC of breast lump showed invasive ductal carcinoma. CT scan of chest and bone-scan ruled out any metastasis. Six cycles of cyclophosphamide, doxorubicin and 5-flurouracil based chemotherapy was given to the patient. The lesions of breast and axilla responded very well and disappeared in scinti–mammography but the supraclavicular lymphnode did not regress in size. Modified Radical Mastectomy (MRM) of left breast with the left supraclavicular lymphnode dissection was done. Histopathology report confirmed the breast lesion as infiltrating duct carcinoma and all the dissected lymphnodes were positive for metastasis. Surprisingly, the histopathology of supraclavicular lymphnode was of metastatic papillary carcinoma of thyroid. The estrogen receptors and progesterone receptors (ER and PR) status was negative and the concentration of ER and PR was only ten percent of the specimen. In Thyroid-scan, there was no hot or cold nodule but the thyroid gland showed the borderline low uptake of radiotracer. Ultrasonography of thyroid showed one small nodule with internal microcalcification in the left lobe with another small colloid nodule in right lobe. Serum T3, T4, TSH values were normal.

DISCUSSION

The coincidence of thyroid disorders and breast cancer has long been a subject of debate. Carcinoma of breast and thyroid has been linked by common genetic and hormonal changes as both are more common in females with peak age in postmenopausal. Thyroid and breast, both are under the influence of similar hormones.[1] TSH receptors are present abundantly in breast tissue.[1] On the other hand estrogen may influence the development, physiology and pathology of human thyroid glands.[2] Geographic variation of the incidence of breast cancers has been attributed due to difference in dietary uptake of iodine.[3] Iodine and iodine rich seaweed was found to inhibit the development of breast tumor and it is supported by the relatively low rate of breast cancer in Japanese women who consume diets rich of seaweed.[3] Increased level of Thyroid peroxidase (TPO) has been associated with significant improvement in outcome of breast cancer patients and has the same prognostic importance like axillary nodal status and tumor size.[1] Non-toxic goiter and antithyroid peroxidase autoantibodies have been found more than twice as common in the breast carcinoma patients compared than in controls.[4] Almost every form of thyroid disease, including nodular hyperplasia, hyperthyroidism, thyroiditis, nontoxic goitre and thyroid cancer has been identified in association with breast cancer.[1]
Giani et al. found that the overall prevalence of thyroid disease was 47 in 102 (46%) in breast cancer patients and 14 in 100 (14%) in controls ($P < 0.0001$).\(^3\) Shering et al. suggested a direct relationship between the thyroid enlargement and breast cancer.\(^4\) In his study 45.5% of breast carcinoma patients showed thyroid enlargement compared with only 10.5% of controls.\(^4\) The chances of developing second malignancy after primary thyroid or breast cancer may be up to 30% higher compared with general population.\(^5,6\) A significantly elevated risk of thyroid cancer following breast cancer (standardized incidence ratios (SIR) = 1.68) and breast cancer following thyroid cancer (SIR = 1.89) was demonstrated in data from the Connecticut Tumor Registry.\(^6\) Tanaka et al. noted that Japanese females with history of breast cancer expressed increased risk (number observed/number expected (O/E) = 3.7, 95% confidence interval (CI) = 1.5 - 7.6) of developing second cancer of thyroid.\(^7\) Data of primary breast cancer patients from the Cancer Registry of Slovenia also showed increased risk (SIR = 2.5, CI = 1.2-4.6) for second primary cancer of the thyroid.\(^8\) In another study, women with history of breast cancer showed almost three times (95% CI = 0.78-7.9) more chances to develop thyroid cancer than women with no such history.\(^10\)

The results of these studies indicate a significant association between breast cancer and thyroid disorders. However, more research on this subject is required to confirm this association.

**CONCLUSION**

The coincidence between breast cancer and thyroid disorders is a matter of extensive debate. This may be due to the close medical surveillance of cancer patients, early exposure to common risk factors or genetic susceptibility of certain subpopulations for both malignancies. More research in a larger cohort of patients is needed to confirm this association.

**REFERENCES**