



STUDY OF ASSOCIATION BETWEEN SERUM “TSH” AND THYROID NODULE

General Surgery

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ABSTRACT

Introduction: The Thyroid nodule is a common clinical problem. It includes both benign and malignant tumours arising in the thyroid gland. Thyroid cancers are heterogenous group of tumours with variable rates of growth, biological aggressiveness, histological features, and response to therapy. As thyroid carcinoma comprises a small percentage of thyroid nodules, doing FNAC in all patients of thyroid nodules may not be a good proposition. So if there is any biochemical parameter, it has a positive correlation with thyroid carcinoma, it may be a good guide to subsequent FNAC and planning management protocol later.

Aims And Objectives:

- 1) To study the association between serum TSH and thyroid nodules.
- 2) To assess serum TSH concentration as a predictor of thyroid malignancy in patients with thyroid nodule.

Methodology: This prospective study included 100 patients presenting with thyroid swellings satisfying the inclusion and exclusion criteria from inpatient registry of DEPARTMENT OF GENERAL SURGERY, ASRAM Hospital, during study period MAY2021-MAY 2022. **Results:** The post-operative biopsy report correlated with pre-operative TSH values, benign being 1.6-1.9mIU/ml and malignant being 2.6-2.9 mIU/ml. **Conclusion:** Thyroid diseases are common in female population. Nodules in male are associated with high chances of malignancy. Swellings that are hard or variable from hard to firm in consistency are more likely malignant. Swellings of size >4 cms are more likely to be malignant. The incidence of malignancy is higher in SNT when compared to MNG, but papillary carcinoma is commonest in both. Mean TSH value is significantly higher in malignancy than in benign disease. TSH levels also show variation in different malignancies : papillary>follicular>medullary

KEYWORDS

INTRODUCTION:

Thyroid nodules includes both benign and malignant tumours arising in the thyroid gland. In India, thyroid cancer accounts for less than 1% of all malignancies (2% of women and 0.5% of men). Thyroid cancer is responsible for 6 deaths per 1 million persons annually. Although thyroid cancer accounts for less than 1% of all cancers, it is the commonest endocrine tumour that shows a geographic variation in the incidence of tumour type and natural history. Thyroid cancers are heterogeneous group of tumours with variable rates of growth, biological aggressiveness, histological responses and response to therapy.

The incidence of thyroid carcinoma in clinically evident solitary thyroid nodules that are surgically resected varies from 15 to 30% in different series. Women in middle age about 5 times more commonly affected than men. These tumours also demonstrate a 3:1 female predominance. There are about 30 to 40 new cases of thyroid cancer /million/year, of which annual mortality from thyroid cancer is about 4 to 5 /million/year. Difference between incidence and mortality reflects the favourable prognosis of most thyroid carcinomas. Though these lesions have the potentiality to aggressiveness and metastasis, 90 to 95% of thyroid cancer cases are categorized as well-differentiated tumours arising from follicular cell, have a favourable prognosis.

In thyroid, nodules become palpable, if they increase beyond 1cm in size. 4% of the general population has detectable enlargement of thyroid. Although nodules are common, clinically detectable thyroid cancer is rare. Serum TSH is a well-established growth factor for thyroid nodules and suppression of TSH concentrations by administering exogenous thyroxine may interfere with growth of established nodules as well as formation of new nodules. Objective of the study was to determine the association between serum Thyroid stimulating hormone (TSH) concentration with thyroid nodules, secondly to predict thyroid malignancy by using Serum TSH concentration in patients with thyroid nodules.

AIMS & OBJECTIVES:

- 1) To study the association between serum TSH and thyroid nodules.
- 2) To assess serum TSH concentration as a predictor of thyroid malignancy in patients with thyroid nodule.

MATERIALS AND METHODS:

This prospective study included 100 patients presenting with thyroid swellings satisfying the inclusion and exclusion criteria from inpatient registry of DEPARTMENT OF GENERAL SURGERY, ASRAM Hospital, during study period MAY 2021 to MAY 2022.

Inclusion Criteria:

- Any thyroid swelling.
- Age group above 15 years.
- Thyroid profile especially TSH levels measured before any medical intervention.
- All cases must be clinically and biochemically euthyroid.

Exclusion Criteria:

- Those cases are not in euthyroid.
- Thyroid lymphomas.
- Thyroiditis.
- Graves disease.
- Patients with comorbid conditions.
- Patients whose serum TSH levels were obtained while on thyroid hormone therapy.

OBSERVATION AND RESULTS:

- Total number of cases 100
- Total number of confirmed malignancies 20

Table:1

GENDER	NUMBER OF PATIENTS
MALE	18
FEMALE	82
TOTAL	100

Table: 2

SIZE	NUMBER OF CASES	MALIGNANT
1-2Cm	8	0
2-3cm	24	0
3-4cm	36	4
>4cm	32	16

Table: 3

TYPE	TOTAL	MALE	FEMALE
PAPILLARY	14	4	10
FOLLICULAR	4	3	1
MEDULLARY	2	1	1

The post-operative biopsy report correlated with pre-operative TSH values, benign being 1.6-1.9mIU/ml and malignant being 2.6-2.9 mIU/ml.

Table: 4

	BENIGN	MALIGNANT
TSH	1.6 – 1.9mIU/ml	2.6 – 2.9 mIU/ml

DISCUSSION:

Thyroid enlargement is a common clinical problem. Most patients with thyroid enlargement can be managed conservatively after malignancy is ruled out. The challenge to the clinician being to identify the minority of patients with thyroid cancer who therefore require surgical intervention. Thyroid cancer is the most common endocrine malignancy and its incidence continues to rise. Thyroid carcinoma in most cases, presents clinically as a solitary nodule or as a dominant nodule within a multinodular thyroid gland. In the general population, thyroid nodules are very common with reported prevalence of palpable nodules in 4-7% of adults (0.5% of cancers in men and 1.5% in women). In most cases, thyroid glands harboring malignancy are clinically indistinguishable from those that do not and physical examination is therefore deemed largely unhelpful in identifying those patients with thyroid cancer.

A major aim of clinical evaluation of patients presenting with thyroid enlargement is to minimize the risk of overlooking thyroid cancer. Recognized clinical parameters raising the suspicion for malignancy include young (<20 yrs) or old age (>70 yrs), male gender, large (>4 cm) or rapidly growing nodules (especially during thyroid hormone therapy) and radiation exposure history. It has been widely perceived that rates of malignancy are higher in subjects with solitary nodules than in those with multinodular goitres, although some of the studies have reported similar rates in these two groups.

Moreover, higher serum TSH levels have been found associated with advanced stages of thyroid cancer. TSH is a well-established growth factor for thyroid nodules and suppression of serum TSH concentrations by administering exogenous thyroid hormone may inhibit the growth of established nodules as well as the development of new thyroid nodules. Moreover, therapy with suppressive doses of thyroxine (T4) has long been known to positively affect outcomes in differentiated thyroid cancer and retrospective studies have shown that TSH suppression is an independent predictor of recurrence of differentiated thyroid cancer. Prospective studies have indicated reductions in thyroid cancer-related death and relapse with aggressive TSH suppression, especially in high-risk patients. Based on these findings, it is plausible that the higher rates of malignancy with increasing serum TSH concentrations reflect a tropic effect of TSH on thyroid tissue promoting neoplasia and carcinogenesis.

These findings suggest that TSH may play a central role in the development and/or progression of thyroid carcinomas. Although oncogenes and other growth factors are involved in thyroid cancer growth and development, it seems probable that TSH can act as a cancer stimulus. This hypothesis is supported by improved survival in thyroid cancer patients treated with suppressive doses of levothyroxine or recombinant TSH.

It is documented that TSH has a trophic effect on thyroid cancer growth, which is most likely mediated by TSH receptors on tumor cells and furthermore that TSH suppression is an independent predictor of relapse-free survival from differentiated thyroid cancer. Studies have shown that the risk increases, associated with serum TSH concentrations in the upper half of the normal range and even more strikingly in those whose TSH measurements were above normal, may at least in part be mediated by this trophic effect of TSH. An alternative explanation is that the patients with lower TSH concentrations were developing autonomous function, which is itself associated with lower rates of malignancy.

Considering serum TSH concentration as an independent predictor of thyroid malignancy, studies have predicted probability of diagnosis of thyroid malignancy, increases from less than 10% for serum TSH concentrations at the lower end of the normal range up to 25% if the

same patient has a TSH concentration at the upper end of the normal range.

With the underlying hypothesis that TSH, a known thyroid growth factor, may have a fundamental role in thyroid cancer development and progression. We looked at the association between serum TSH concentration and thyroid cancer.

CONCLUSION:

- Following conclusion have been drawn from the present study:
- Thyroid diseases are common in female population.
- Nodules in male are associated with high chances of malignancy.
- Swellings that are hard or variable from hard to firm in consistency are more likely malignant.
- Swellings of size >4 cms are more likely to be malignant.
- The incidence of malignancy is higher in SNT when compared to MNG, but papillary carcinoma is commonest in both.
- Mean TSH value is significantly higher in malignancy than in benign disease.
- TSH levels also show variation in different malignancies : papillary>follicular>medullary

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