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A PROSPECTIVE STUDY OF ASSOCIATION BETWEEN SERUM TSH CONCENTRATION AND THYROID CANCER

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ABSTRACT

More recently a few studies have suggested that higher concentration of TSH, even within the normal range are associated with subsequent diagnosis of thyroid cancer in patients with thyroid nodules and even higher serum TSH levels have been found associated with advanced stages of thyroid cancer.

AIMS AND OBJECTIVES

- To evaluate the utility of serum TSH estimation as a biochemical predictor of malignancy in suspicious thyroid nodules.

MATERIALAND METHODS:

PLACE: Chennai Medical College and Hospital Research centre, Trichy
DURATION: November 2015 to June2017 which included a 6 month follow up.
NO.OF PATIENTS:50 patients with thyroid swellings suspicious of malignancy
TYPE OF STUDY:descriptive analysis of clinical presentation and a correlation of TSH level and final histopathology were done.

OBSERVATION AND RESULTS:

Mean preoperative TSH value in malignancy was higher compared to those with benign disease. Incidence of malignancy increased with higher TSH values.

CONCLUSION:

There is a definite relationship between higher TSH levels and malignancy. TSH levels could be used as predictor in clinically suspect malignant thyroid swelling with a benign FNAC report. In such cases where TSH value is high, the FNAC can be repeated to confirm the diagnosis.

KEYWORDS

Thyroid malignancy, serum TSH, thyroid stimulating Hormone

INTRODUCTION

A clinical examination is always the first step to assess a nodule. A thyroid profile is also essential. This is accompanied by certain tests which increase the rate of detection. Fine needle aspiration cytology (FNAC) is the present gold standard and primary tool for assessing risk of malignancy [1]. Other tests include ultrasonography, thyroid scintigraphy, CT scan and MRI.

Recent studies have found levels of serum TSH to be an independent predictor of malignancy in thyroid nodules [2, 3, and 5].This biochemical marker could be used as a screening test for malignancy. In this study we investigated the utility of TSH in predicting malignancy and the common clinical presentation of thyroid malignancy.

AIMS AND OBJECTIVES

The main objective of this study is to evaluate the utility of serum TSH estimation as a biochemical predictor of malignancy in suspicious thyroid nodules.

MATERIALS AND METHODS

This prospective study included 50 patients presenting with thyroid swellings clinically suspicious of malignancy at the department of general surgery, Chennai Medical College and Hospital, Trichy. Duration of study was November 2015 to june 2017which included a 6 month follow up.

Inclusion Criteria:

- Cases presenting with thyroid swellings clinically suspicious of malignancy including those with metastasis.
- At least one FNAC done at the time of initial presentation.
- Thyroid profile especially TSH levels measured before any medical intervention.
- All cases must be clinically and biochemically euthyroid.

Exclusion Criteria:

- Those cases not in euthyroid state.
- Those cases in which FNAC has not been done.

Study Design:

A prospective study with a sample size of 50 patients was conducted at the Patients with clinical features suggestive of thyroid malignancy were included. The preoperative TSH levels were analysed to check for any relationship between TSH levels and the likelihood of a thyroid nodule being malignant. At the same time a clinical study of those patients with confirmed thyroid malignancy was done. The observed results were subjected to statistical analysis. The following observations were made.

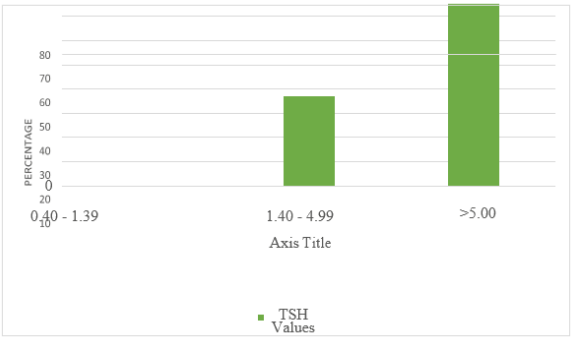
Table : Comparison of TSH values according to histopatho logically confirmed benign disease and carcinoma

TSH	Histopathologically confirmed benign disease	Histopathologically confirmed carcinoma	Pvalue
Min - Max	0.43 – 4.42	1.72 – 5.28	t = 5.124; p < 0.001**
Mean ± S.D	1.80 ± 1.03	3.71 ± 1.22	
95% C.I	1.36 – 2.24	3.00 – 4.42	

Table : Incidence of malignancy according to TSH values in patients studied

TSH values	No. of patients	No. of patients with malignancy	Percentage (%)
0.40 – 1.39	16	0	0.0
1.40 – 4.99	30	11	36.7
>5.00	4	3	75%
Inference	Incidence of malignancy is significantly associated with higher range of TSH with P<0.001**		

TSH Values



- Incidence of malignancy was significantly associated with higher range of TSH.
- The presence of neck nodes was the clinical variable with the strongest association with malignancy

The following table shows the various studies that have shown a relationship between serum TSH concentration and thyroid cancer.

Table : Summary of studies investigating the relationship between serum TSH concentration and thyroid cancer

Authors	Journal	No.of patients	Country	Significant findings
Boelaert et al. (2006) (2)	Journal of Clinical Endocrinology and Metabolism	1500	U.K	Serum TSH is independent predictor of malignancy in thyroid nodules. Risk of malignancy rises in parallel with serum TSH within normal range.
Haymart et al. (2008a)(3)	Journal of Clinical Endocrinology and Metabolism	843	U.S.A	Likelihood of thyroid cancer increases with higher TSH concentration. Higher serum TSH associated with advanced stage differentiated thyroid cancer
Jonklaas et al. (2008) (4)	Thyroid	50	U.S.A	Higher TSH concentrations are associated with diagnosis of thyroid cancer. Patients with thyroid cancer have lower serum total T3 concentrations
Polyzos et al. (2008) (2)	Journal of Cancer Research and Clinical Oncology	565	Greece	Higher rates of thyroid malignancy in patients with TSH in upper tertile of normal range
Fiore et al. (2009) (5)	Endocrine-Related Cancer	10,178	Italy	Higher TSH in patients with T3– T4 disease and in those with lymph node metastases. Autonomously functioning thyroid nodules are less likely to be malignant
Mondal et al.(2011) (7)	JIMA	33	India	There is an obvious trend towards cancer risk with higher TSH value

SUMMARY

This was a prospective study involving 50 patients admitted to our hospital with thyroid swellings suspicious of malignancy. The objective was to evaluate the utility of serum TSH estimation as a biochemical predictor of malignancy in suspicious thyroid nodules. The observations of this study can be summarized as follows:

- The mean preoperative TSH value was 2.39±1.42 mU/L.
- Mean TSH value in malignancy was higher (3.71±1.22mU/L) compared to those with benign disease 1.80±1.03mU/L)
- Incidence of malignancy increased with higher TSH values.

CONCLUSION

Though there are many predictors of thyroid malignancy, none of them can conclusively predict the nature of a thyroid nodule.

In our study we evaluated the utility of preoperative serum TSH levels as a predictor of malignancy and it did show a statistically significant correlation (P=<0.01) between higher TSH levels and malignant nodules. However this relationship between higher TSH levels was not seen in those presenting with no primary thyroid swelling and only cervical lymph node metastasis. The utility of TSH in poorly differentiated carcinoma could not be assessed as all the patients in this series had well differentiated carcinoma.

However, as all patients with a thyroid swelling undergo a thyroid function test it is important to pay special attention to the TSH values. . TSH levels could be used as predictor in clinically suspect malignant thyroid swelling with a benign FNAC report. In such cases where TSH value is high, the FNAC can be repeated to confirm the diagnosis

REFERENCES

1. Williams NS, Bulstrode CJK, O'Connell PR, The Thyroid and Parathyroids, Bailey & Love's Short Practice of Surgery. 26th ed. CRC Press; 2013; 741- 777.
2. Boelaert K, Horacek J, Holder RL, et al., Serum thyrotropin concentration as a novel predictor of malignancy in thyroid nodules investigated by fine needle aspiration, J. Clin Endocrinal Metab. 2006; 91:4295-4301.
3. Haymart MR, Repplinger DJ, Leverson GE, et al, Higher TSH level in thyroid nodule patients is associated with greater risks of differentiated thyroid cancer and advanced tumor stage, J Clin Endocrinal Metab. 2008;93:809-14.
4. Manoj Gupta, Savita Gupta, and Ved Bhushan Gupta, "Correlation of Fine Needle Aspiration Cytology with Histopathology in the Diagnosis of Solitary Thyroid Nodule," Journal of Thyroid Research, vol. 2010, Article ID 379051, 5 pages, 2010. doi:10.4061/2010/379051.
5. Stergios A. Polyzos, Marina Kita, Zoe Efstathiadou et al, Serum thyrotropin Concentration as a biochemical predictor of thyroid malignancy in patients presenting with thyroid nodules, J Cancer Res Clin Oncol. 2008; 134:953-96.
6. Townsend M jr, Beauchamp RD, Evers BM, Mattox KL. Sabiston textbook of surgery. 19th edition, Saunders Elsevier; 2012; 886-923.
7. Oertli D, Udelsman R. Surgery of Thyroid and Parathyroid Glands. History of thyroid and parathyroid surgery. 1st edition, Springer, 2007; 1:311-21.
8. Duffy BJ Jr, Fitzgerald PJ. Cancer of thyroid in children, a report of 28 cases. J Clinical Endocrine Metabolism. 1950; 159:1007.
9. Langman J, Sadler TW, Langman's medical embryology. 9th edition, Philadelphia: Lippincott Williams & Wilkins, 2004; 384-6.
10. Skandalakis J E, Skandalakis P N, Skandalakis' Surgical Anatomy and technique. 4th edition, Springer, 2014; 32-41.