VOLUME-6 | ISSUE-2 | FEBRUARY-2017 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 78.46

A CLINICAL STUDY OF THYROID MALIGNANCY AND ROLE OF TSH IN PREDICTING MALIGNANCY

General Surgery

KEYWORDS:

Dr.F.CelineFoustinaMary	MS, Assistant Professor, Madurai Medical college
Dr.K.AshokKumar	MS, Assistant Civil Surgeon, Government hospital, thiruvallur
Dr. Shiva Kumar Rathlawath	Final year Post graduate, Madurai medical college

ABSTRACT

BACKGROUND: Many patients present to the surgical department with a thyroid nodule.However not all require surgery and only 5-6% of these are malignant. There are many methods to diagnose and predict malignancy in a thyroid nodule. This study throws light on the usefulness of TSH estimation and its role in predicting malignancy.

AIMS AND OBJECTIVES

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

2) To study the clinical presentation and management of various thyroid malignancies.

MATERIAL AND METHODS: This prospective study involved 50 patients admitted to Madurai medical college, madurai with thyroid swellings suspicious of malignancy. A descriptive analysis of clinical presentation and a correlation of TSH level and final histopathology were done.

OBSERVATION AND RESULTS: Most patients were females. The Mean age of malignancy was 40 years with a higher mean age in males (59 years) as compared to females (38 years). Commonest presentation was a rapidly growing thyroid swelling of short duration or development of secondary symptoms in a long standing goitre.

Majority of patients presented with a SNT. The incidence of malignancy was higher in SNT (36%) compared to MNG (19%). 4 patients presented with primary complaints other than a neck swelling. patients presented with cystic swelling of neck which turned out to be cervical lymph node metastasis. The incidence of neck nodes was 20% and distant metastasis was 0%. .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 relooked to confirm the diagnosis.

INTRODUCTION

Thyroid diseases have always been an enigma. The management of thyroid diseases has undergone a tremendous change over the ages, from the crude surgeries of the ancient times to the multidisciplinary approach of the modern era. However in the present situation surgery still plays an prominent role in the management of thyroid malignancies.

Thyroid malignancies account for 90% of endocrinal malignancies. In past three decades incidence of thyroid malignancy is increasing. Many patients present to the surgical outpatient department with a thyroid nodule. However not all these patients require surgery as only 5-6% of these are malignant [2, 3]. There are many methods to diagnose and predict malignancy in a thyroid nodule.

First step is clinical examination of thyroid swelling. 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 important tool for ascertain the risk of malignancy [1]. Other tests include ultrasonography, thyroid scintigraphy, CT scan and MRI.

Recent studies and research have found that levels of serum TSH can be an independent predictor of malignancy in thyroid nodules .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 malignancies.

OBSERVATION AND RESULTS

This was a prospective study done in the Department of General Surgery at Madurai medical college,madurai.

Total number of cases - 50

Total number of confirmed malignancy – 15

Study Design:

A prospective study with a sample size of 50 patients was conducted at the Department of General surgery, Madurai medical college, Madurai. Patients with clinical features suggestive of thyroid malignancy were included. The preoperative TSH levels were analyzed 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 confirmedthyroid malignancy was done. The observed results were subjected tostatistical analysis. The following observations were made

DISCUSSION

PREDICTORS OF MALIGNACY IN THYROID NODULES

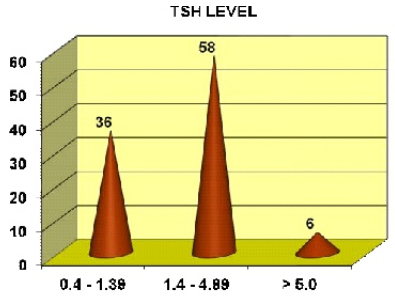
There are many predictors of malignancy in a thyroid nodule. A history of previous radiation exposure especially during childhood is more common in many cases of papillary carcinoma. Similarly, exposure to certain environmental risk factors such as excess dietary intake of iodine, retinol and vitamin E has shown to have an increased chance of malignancy. Age factors: Younger age group (<20 years) and older age group (>70years) have a higher risk of malignancy. Associations with other inherited syndromes such as familial polyposis coli, Gardner's syndrome and Cowden's syndrome is seen with medullary carcinoma thyroid[9,10]. In the presence of certain clinical signs and symptoms i.e. hard and fixed nodules, large nodules (>4cm) with presence of neck lymph nodes, rapid increase in size of thyroid nodules, associated hoarseness of voice, dysphagia, dyspnea and Horner's syndrome malignancy should always be suspected.

Suspicious criteria by ultrasound include central hypervascularity, microcalcifications solid and cystic component ratio, smaller than

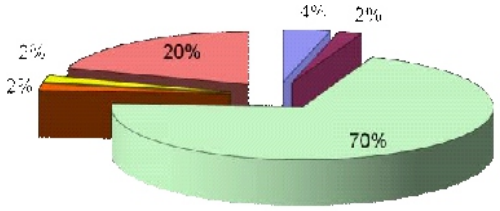
2mm in diameter, irregular borders and invasion into surrounding tissues. Ultrasound scan is more sensitive than clinical examination in the identification of enlarged neck nodes. Cervical lymph nodes, infiltrated by papillary carcinoma may be entirely cystic and mimic other cystic masses of the neck, such as a branchial cyst, while calcification may be seen within nodes invaded by medullary carcinoma. Serum TSH levels – a novel method in predicting malignancy Many studies have shown a definite relation between preoperative serum TSH levels and thyroid malignancy. Furthermore, preoperative serum TSH concentrations are higher in patients with more aggressive tumors. Thus a baseline TSH would predict which nodules require a more aggressive approach and surgery. Rational behind choosing TSH levels as a predictor of Malignancy Thyroid stimulating hormone is a wellknown thyroid growth stimulating factor. Well-differentiated thyroid cancers express TSH receptors.

Although oncogenes and other growth factors are involved in thyroid cancer growth and development, it is possible that TSH can act as a cancer promoter. This hypothesis is supported by increased disease free survival in thyroid cancer patients treated with suppressive doses of levothyroxine and by cases of tumor growth post-T4 withdrawal or recombinant TSH. Some clinical studies have showed higher serum TSH levels associated with advanced stages of thyroid cancer. These proves that TSH possibly play a main role in the development and /or progression of thyroid carcinomas. Supportive of the TSH receptor's role in cancer are the data on autoimmune thyroid disease and thyroid cancer.

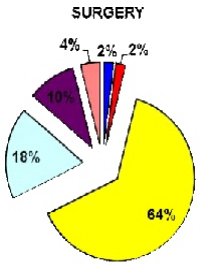
OBSERVATIONS:



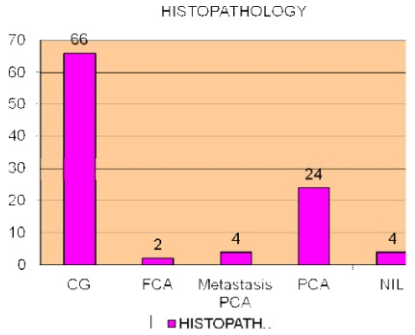
TSH LEVEL	No.of Cases	PERCENTAGE
0.4 - 1.39	18	36
1.4 - 4.99	29	58
> 5.0	3	6
TOTAL	50	100



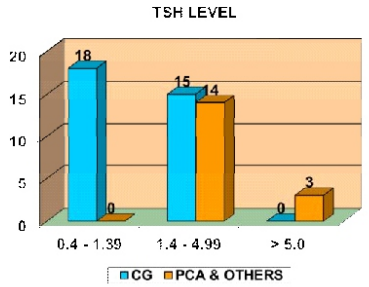
FNAC	No.of Cases	PERCENTAGE
BC	2	4
CAT	1	2
CG	35	70
FN	1	2
MNG	1	2
PCA	10	20
TOTAL	50	100



SURGERY	No.of Cases	PERCENTAGE
Excision	1	2
Excision TT+LND	1	2
STT	32	64
TT	9	18
TT+LND	5	10
NIL	2	4
TOTAL	50	100



HISTOPATHOLOGY	No.of Cases	PERCENTAGE
CG	33	66
FCA	1	2
Metastasis PCA	2	4
PCA	12	24
NIL	2	4
TOTAL	50	100



TSH LEVEL	CG	PCA & OTHERS
0.4 - 1.39	18	0
1.4 - 4.99	15	14
> 5.0	0	3

incidence of malignancy significantly associated with higher range of TSH

In this study we had a total of 50 patients who presented with clinical features suspicious of thyroid malignancy. The main objective was to evaluate the role of TSH as a biochemical predictor of malignancy. Only patients that were euthyroid were included.

Of those patients with confirmed malignancy a descriptive analysis of the clinical presentation and management was done. The observations and results were subjected to statistical analysis and compared with other studies.

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GENDER DISTRIBUTION:
There were 43 female patients and 7 male patients in this study. 15 (13 female and 2 male) out of these 50 patients had FNAC /histopathologically proven malignancy.

As thyroid diseases are more common in females the incidence of thyroid carcinoma is also more in the female sex.

AGE DISTRIBUTION
The age distribution of our study group ranged from 19 years to 85 years. With mean age of mean age was 44.62 years ±15.12.

The mean age for thyroid malignancy was 40 years which was comparable to other studies [4, 5, 6].Mean age in males was 59 years whereas in females was 38.

RISK FACTORS:
On eliciting the history none of the patients had direct exposure to risk factors such as ionizing radiation, family history, high iodine diet and goitrogens.

There is a higher incidence of malignant thyroid nodules in extremes of age. In this study majority of male patients (50%) presented after 60 years. In the females 46% presented in the 2nd and 3rd decade of life.

There was a higher percentage of malignant nodules in male patients (50 percent) which in consistent with the findings of Haymart, et al (4) that male sex is a risk factor for malignancy [7, 8].

DURATION OF DISEASE
Most patients presented with rapidly growing thyroid swellings of duration of 1-2years. Some patients had goiters for more than a decade and presented with a recent change in size or appearance of certain new symptoms.

A sudden rapid increase in the size of a thyroid swelling or any compressive symptoms such as dyspnea, dysphagia, dysphonia or Horner's syndrome is suggestive of a malignant change.

CLINICAL FEATURES
The most common presenting symptom is a thyroid swelling. Majority presented with a solitary nodule of thyroid. Others presented with a dominant nodule in a multinodulargoitre. The next common complaint was pain and discomfort in the neck (8%). 17% of the patients had compressive symptoms in the form of dyspnea, dysphonia and dysphagia.

occurence of thyroid malignancy in a solitary nodule of thyroid was more (36%) than the incidence of malignancy in multinodulargoitre (19%). 4 patients presented with complaints of a neck swelling other than a thyroid swelling.

2 of these patients presented with solitary cystic swelling of neck which turned out to be cervical lymph node metastasis with occult primary thyroid malignancy.

Solitary lateral cervical cystic swelling is an uncommon presentation of papillary thyroid carcinoma (PTC). The results of the USG and FNAC are usually inconclusive, excision biopsy of the cyst is essential for early diagnosis and management.

In this study both FNAC and USG were inconclusive. Diagnosis could only be confirmed on histopathology.

CERVICAL LYMPH NODE INVOLVEMENT
Neck nodes is a most common presentation in thyroid malignancy.

Approximately 30% to 60% of patients with papillary thyroid carcinoma will have involvement of clinically significant cervical lymph nodes at the time of presentation.

DISTANT METASTASIS
The incidence of distant metastasis in this study was 0%.

HISTOPATHOLOGY
In this series all were well differentiated carcinoma. Papillary carcinoma was the commonest histopathological type (93%) followed by follicular type (7%).

TSH LEVELS AND THE RISK OF MALIGNANCY.
In this study the mean preoperative TSH value was: 2.39±1.42mU/L. All patients were euthyroid. The mean TSH value was significantly higher in malignancy than in benign disease i.e. 3.71±1.22mU/L vs. 1.80±1.03mU/L.

On analysis of the preoperative TSH values it was found that TSH level was an independent predictor of thyroid malignancy. Patients with values of 0.40-1.39 mU/L had no chance of malignancy. Those with range of 1.40-4.99mU/L had 36.7% chance of malignancy whereas those with TSH levels >5mU/L had 75% chance of malignancy

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

Most patients were females with mean age of 44.62±15.12 years. Mean age of malignancy was 4o years with a higher mean age in males (59 years) as compared to females (38 years).

- Commonest presentation was a rapidly growing thyroid swelling of short duration. In some cases there was history of a longstanding goitre with sudden development of secondary symptoms such as pain and compressive symptoms.
- Majority of patients presented with a SNT. The incidence of malignancy was higher in SNT (36%) compared to MNG (19%). 4 patients presented with primary complaints other than a neck swelling. 2 patients (4%) presented with cystic swelling of neck which turned out to be cervical lymph node metastasis.
- The incidence of neck nodes was 12% and distant metastasis was 0%.
- 24% of patients had FNAC positive for malignancy with 2% doubtful results.
- Papillary carcinoma was the most common histopathological type.
- The mean preoperative TSH value was 1.4 to 4.9 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 value

CONCLUSION
Thyroid malignancies have a varied clinical presentation. The commonest presentation being that of a solitary thyroid nodule. 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 relooked to confirm the diagnosis.

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