



CORRELATIVE STUDY OF THYROID PROFILE AND CYTOLOGICAL DIAGNOSIS OF THYROID LESIONS

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ABSTRACT

Thyroid disorders are a common entity worldwide, causing significant morbidity. Symptoms range from fatigue, anaemia, menstrual disorders, constipation, weight gain to even psychological effects like mental apathy and depression. One study, conducted in 2015 by Kumaravelu Velayutham et al^[1] states that, one in every eight young women of south India suffer from thyroid disorders. Also, these disorders affect all age group, from children to adults.

The common thyroid disorders seen in India are iodine deficiency disorders, thyroiditis and thyroid tumors. Investigations for thyroid nodules are recommended if a nodule is larger than 10mm, and from 5mm, if the person has a positive family history^[2]. These disorders can be diagnosed by various modalities like Thyroid Profile, Ultrasonogram, Fine needle aspiration cytology (FNAC) and histopathology. Of these, FNAC play a significant role. FNAC is a pre operative tool that plays a significant role in critical decisions like differentiating between benign and malignant conditions. Careful location of the target lesion, thorough microscopic screening of slides and repeat FNAC when warranted are the factors that greatly improve the sensitivity and specificity of this test and greatly reduce errors in diagnosis. USG guided FNAC is a good tool that enhances diagnostic quality. FNAC thyroid is considered as the 'gold standard' in diagnosis of thyroid nodules^[3].

Thyroid hormonal studies that includes total tri-iodothyronine (T3), total thyroxine (T4) and thyroid stimulating hormone (TSH) is one of the preliminary investigation to evaluate thyroid disorders that helps to establish the thyroid status of the patient.

KEYWORDS : Thyroid disorders, FNAC, hormonal studies

AIM

The aim of the study is to correlate the cytological findings of various thyroid lesions with thyroid profile values and to determine if it helps in improved accuracy of diagnosis, if it reduces error and gives better insight for clinical correlation which eventually helps in early diagnosis of both benign and malignant thyroid lesions.

MATERIALS AND METHODS

This study was conducted in a medical college hospital of Southern Tamil Nadu over a period of one and a half years and included 104 cases with thyroid lesions. Cases of thyroid disorders with neck swelling were included in the study. Serological assessment of thyroid hormones was done using automated analyser and the values of Triiodothyronine (T3), Thyroxine (T4) and Thyroid stimulating hormone (TSH) were obtained.

FNAC thyroid was done using 23 to 25 gauge needle by non aspiration technique to avoid excess hemorrhage in smears. Though FNAC by aspiration technique yields diagnostically adequate smears, non aspiration technique is said to yield diagnostically superior smears[4]. FNAC diagnosis and Thyroid profile values were correlated.

RESULTS

This study was conducted on 104 patients, of these 97 were females and seven patients were male.

According to our study, commonly affected age group was between 30 to 40 years (36%), followed by 40 to 50 years (19%) and 20 to 30 years (18%) (chart 1).

The distribution of cases with regard to thyroid profile status (chart 2) showed that majority population of cases had Euthyroid status (57%) despite having thyroid swelling and positive findings in FNAC. The percentage of population with hypothyroidism, subclinical hypothyroidism and hyperthyroidism was 20%, 16% and 7% respectively.

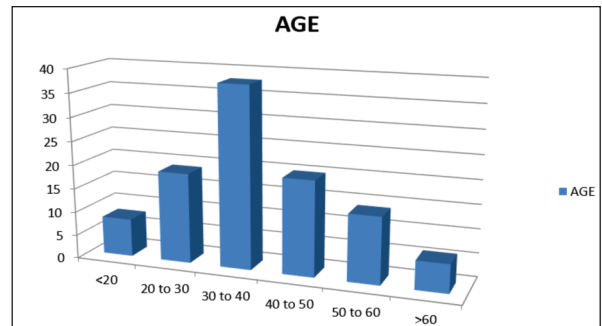


Chart 1 - Age Wise Distribution

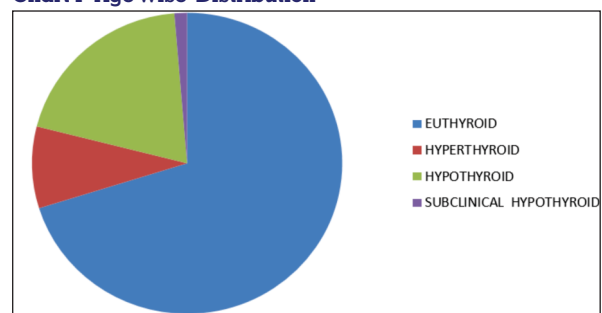


Chart 2 - Thyroid Profile Status

Out of 104 cases, Colloid goitre was the commonest diagnosis (59 cases) followed by hashimoto thyroiditis (16 cases) and lymphocytic thyroiditis (13 cases). (Refer table 1)

DIAGNOSIS	NUMBER OF CASES
COLLOID GOITRE	59
HASHIMOTO THYROIDITIS	16
LYMPHOCYTIC THYROIDITIS	13
ADENOMATOUS HYPERPLASIA	9
TUMOR	7

Of the 7 tumor cases of thyroid, follicular neoplasm constituted of 3 cases, 1 case was suspicious of papillary carcinoma, 2 cases of papillary carcinoma and one case of medullary carcinoma.

DISCUSSION

Thyroid enlargement is a common condition in Indian population and is more common in females than in males. The male to female ratio in various studies was 1:10 [5] and in our study it was 1:14.

Our study population has age group ranging from 19 to 70 years of age. The age group commonly affected in our study is between 30 and 40 years which is similar to the observation in other previous studies by Ambika Gopalakrishnan et al [6].

The common conditions of thyroid according to previous studies [7] is iodine deficiency goitre in iodine deficient areas and thyroiditis in iodine replete areas, which is similar to our study which shows, highest number of cases are colloid goitre followed by thyroiditis.

Investigations commonly done for thyroid enlargement includes thyroid profile, Ultrasonogram, Radioisotope studies and FNAC thyroid.

Thyroid Profile correlation with the FNAC reports revealed that out of the 16 Hashimoto patients, 5 were Euthyroid, 6 were hypothyroid and 5 had subclinical hypothyroidism.

Totally, 59 patients were diagnosed as Colloid Goitre by FNAC. Thyroid profile of these 59 patients revealed that 40 were Euthyroid, 6 were hypothyroid, 8 had subclinical hypothyroidism and 5 were hyperthyroid.

Of the 29 patients diagnosed as thyroiditis, 13 were Euthyroid, nine were hypothyroid, 5 had subclinical hypothyroidism and 2 were hyperthyroid.

Nine cases were diagnosed as Adenomatous hyperplasia, out of which four were Euthyroid, three had hypothyroidism, one patient had subclinical hypothyroidism and 1 patient had hyperthyroidism.

Out of the 7 tumor cases 1 patient was euthyroid and three patients had hypothyroidism and three patients had subclinical hypothyroidism.

The total number of cases in our study was 104. Of these 58 cases were Euthyroid, 21 had hypothyroidism, 17 cases had subclinical hypothyroidism and 8 patients had hyperthyroidism, which is similar to study conducted by Suman Poudel et al [8], which also had a majority of subjects having euthyroid status despite having thyroid lesions. So, thyroid lesions do not always present with abnormal thyroid profile.

Ultrasonogram studies of thyroid gives us information if the underlying lesion is cystic or solid, presence of nodules, microcalcifications and lymphadenopathy. Studies conducted by Ozel et al in 2012 [9] reveal that ultrasound of thyroid has a positive predictive value of 62.5% in diagnosing malignant lesions in nodules more than 1 cm size.

Radioisotope studies work on the principle that nodules that take up isotopes are hot and those that do not take are cold nodules. Usually malignant nodules are non-functioning and cold. Study by NS Neki et al reveals that 85% of thyroid nodules are cold [10] and 15% of nodules are hot. 10 to 25% of cold nodules and 1% of hot nodules are malignant. Thus, these tests need to be correlated clinically.

Molecular screening is an advance investigation for thyroid nodules. These tests are usually done in case of indeterminate cytology. It includes mutations of NRAS, HRAS, BRAF, KRAS, translocations of RET/PTC and PAX/PPARG. These tests indicate high risk lesions that require further follow up [11].

FNAC thyroid is currently reported using the Bethesda system of reporting thyroid cytology (BSRTC). This reporting system was devised in 2007 [12]. Studies done on correlating FNAC thyroid with histopathological results revealed that FNAC had a diagnostic accuracy of 92.7% [13]. Moreover a study by Emilio et al [14] conducted in 2012, reveal a strong positive relation between elevated TSH levels and carcinoma thyroid especially papillary carcinomas. In our study, out of the seven tumor cases, six patients had elevated levels of TSH and all three cases of papillary carcinoma had elevated TSH values.

The main aim of initial investigations in a thyroid enlargement is to differentiate benign from malignant lesion. The management for a benign case may be thyroid conserving approach but for a malignancy it is mostly total thyroidectomy [15]. Moreover, certain studies show that despite increase in incidence of thyroid carcinomas the mortality rate is stable [16]. This could be mainly attributed to early diagnosis by efficient modalities. Thyroid cancers that are diagnosed at an early stage have an overall five year survival rate of 98% [17].

Studies published by You-Seog Jung in 2018 [18] reveal that there is significant early detection and decline in mortality on combining screening detection and clinical detection of thyroid cancers, as opposed to only clinical detection.

CONCLUSION

Thyroid Profile has varying presentations in different thyroid lesions. Previous studies state that there is no correlation between FNAC thyroid and Thyroid profile [19], still TSH measurement and FNAC thyroid should be a part of initial thyroid workup. This is because elevated TSH values are strongly related to thyroid carcinomas and the risk of thyroid malignancy increases with increase in serum TSH values [20].

FNAC thyroid has good sensitivity (84%) and specificity (100%) [21] in diagnosing thyroid lesions. Combined FNAC thyroid with Serum TSH level as an adjunctive diagnostic test, helps greatly in risk stratification of thyroid nodules and helps to decide on further follow up and therapeutic approach.

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