

## The change in the trend of thyroid cytopathology- A retrospective observational study

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### Abstract

Thyroid disorders have become increasingly common over the past few years. The present study aims at comparing the cytomorphological features of the thyroid aspirates obtained from patients attending a rural tertiary care teaching hospital with thyroid enlargement in two different years i.e. 2009 and 2015 and evaluating the change in trend of the presenting thyroid pathology.

**Keywords:** Fine-needle aspiration (FNA), The Bethesda System for Reporting Thyroid Cytopathology (TBSRTC).

### Introduction

Thyroid, an important endocrine organ, is affected by many disease processes which present as diffuse or nodular enlargements of the gland. India has been estimated to have at least 42 million suffering from thyroid related problems.<sup>1</sup>

FNA is the first line of investigation for any thyroid nodule/ enlargement which can be used for early diagnosis and treatment which remain the cornerstone of thyroid disease management to avoid morbidity and/or mortality in patients.<sup>2</sup>

The main purpose of this study is to determine whether the presenting pattern of the thyroid disease has changed in a gap of 5 years and to classify the disorders as per the Bethesda system of reporting thyroid cytology.

### Materials and Methods

This is a retrospective observational comparative study of thyroid cytology findings observed in patients who were subjected to thyroid FNAC in the Pathology department of CMCH&RC, Irungalur, Trichy in 2009 and 2015.

The cytology smear reports from 2009 and 2015 were retrieved and reviewed wherever needed and then

classified according to the Bethesda System for Reporting Thyroid Cytopathology (TBSRTC)<sup>3</sup>

TBSRTC recommends a format which has six diagnostic categories. The general categories of diagnosis and the subcategories are listed here.

Category I: Non diagnostic or unsatisfactory

Category II: Benign

Category III: Atypia of undetermined significance or Follicular Lesion of undetermined significance.

Category IV: Follicular neoplasm or Suspicious for a Follicular Neoplasm.

Category V: Suspicious for malignancy.

Category VI: Malignant

### Observations

#### Comparative observation of thyroid FNAC of 2009 and 2015

According to this study, FNAC for thyroid enlargement was done in a total of 222 patients in 2009 and 204 patients in 2015.

The study recorded a maximum number of cases to be benign under

Category II of BSTRC i.e. a total of 130 in 2009 and 184 cases in 2015.

**Table 1:**

Diagnosis of Thyroid Disease	Number of cases 2009	Number of cases 2015	Category (TBSRTC)
Non- Diagnostic	10	07	CAT-I
Colloid Goiter / Nodular colloid Goiter /colloid nodule	67	118	CAT-II
Hashimoto thyroiditis	51	28	CAT-II
Lymphocytic thyroiditis	12	38	CAT-II
Atypia of undetermined significance	10	05	CAT-III
Suspicious of Follicular neoplasm	40	06	CAT-IV
Suspicious of malignancy	4	0	CAT-V
Malignancy	28	02	CAT-VI

The study also observed that in 2009 a total of 83 males and 139 females were subjected for FNAC of thyroid while in 2015 about 185 females and only nineteen males underwent thyroid FNAC.

The benign lesions of category II were more common in females in both 2009 (80 nos.) and 2015 (171 nos.) though the numbers had doubled over the gap of 5 years. However in contrast to the former, cases cytologically grouped under category III had halved over the period of 5 years.

The number of cases cytologically diagnosed to have thyroiditis (Lymphocytic or Hashimoto's) grouped under category II had not changed much over the years, it was 63 and 66 patients in the years 2009 and 2015 respectively with majority being females. However interestingly, the female to male ratio had altered from 6:1 to 32:1 over the gap of 5 years.

Records revealed that those with lesions under category IV in 2009 were 18 males and 22 females while 4 cases fell under category V with male predominance (3:1). However those aspirated in 2015, grouped under category IV were only 6 and under category VI in 2009 there were twenty eight cases with majority being females (21 patients) while in 2015 only two cases fell in this category much in contrast to the findings of 2009.

The youngest patient to present for FNAC of thyroid enlargement in 2015 was a one year old female child who had goitre with cytological features suggestive of atypia of undetermined significance with clinical suspicion of dysmorphogenetic goitre and in 2009 it was a 12 year female child with colloid goitre.

In 2009 the oldest patient was a 74 year old male diagnosed to have a lesion - Suspicious of follicular neoplasm (CAT IV) while records of 2015 showed that the oldest patient was an 80 year old female diagnosed by cytology to have papillary carcinoma therefore under category VI of TBSRTC.

**Comparison with other Studies:** The mean age at presentation was 42.2 years in 2009 and 39.4 years in 2015. Dorairajan N et al<sup>4</sup> observed that majority of the patients with thyroid lesions were in the age group of 30-50 years and a very small number were below 20 years of age. Our study is in concordance with this study.

N Kukar, V Malhotra, M Saluja<sup>2</sup> say that thyroid lesions are more prevalent in females than males. 89.3% of cases were females and 10.7% males. Male to female ratio was 1:8.4. Similar findings were reported by Dorairajan N et al<sup>4</sup> with Male to Female ratio being 1:9. Our study is in concordance with these studies which shows thyroid lesions are commoner in women (62.6% in 2009 & 90.6% in 2015) when compared to men. In-fact the men presenting with thyroid enlargement for FNA had drastically reduced from 37.4 % in 2009 to 9.3% in 2015.

Diffuse thyroid enlargement was the most common presentation in both 2009 (112 cases) and 2015 (187

cases) with a striking female preponderance, similar findings were noted by N Kukar, V Malhotra, M Saluja<sup>2</sup> who in their study showed diffuse swelling (60.4%) followed by solitary nodule (29.5%).<sup>3</sup> Hyang et al<sup>9</sup> (2003) in a study on 1344 cases of thyroid lesions observed a high incidence of Diffuse enlargement of the thyroid (90%).

The benign lesions under category II had a majority of 63 cases and 66 cases of thyroiditis much in concordance with the study done at a FNA clinic in Malaysia, by Jayaraman and group<sup>6</sup> noted that a greater frequency of thyroiditis was among patients of Indian origin. Shirish et al<sup>7</sup> also points out that the incidence of Hashimoto's thyroiditis seems to be increasing in the recent times and appears to be one of the most common cause of hypothyroidism and thyroid enlargement in Asia.

In 2009 Non diagnostic cases were 10 (4%) and in 2015 it was 7 cases (3.4%) while benign lesions with no signs of any atypia were 130 (58.5%) and 184 (90.1%) cases respectively, which account for the majority of the cases in concordance with the recordings of the 2007 National Cancer Institute Thyroid Fine-Needle Aspiration State-of-the-Science Conference.

In our 2009 study, of the total of 222 cases, 72 cases fell under categories IV, V and VI. Of which those under CAT IV were the commonest (18%) followed by CAT VI (12%) as reported by Kukar et al<sup>2</sup> in their study on 412 cases which said that 66.1% were under CAT IV followed by 8.5% under CAT VI in concordance with ours and a similar observation by Alexander et al<sup>5</sup> also show that 31% was under CAT IV and 21% lesions were CAT V.

However the study of the reports of 2015 shows a very low occurrence of neoplastic lesions with CAT IV only in 6 cases (2.9 %) and CAT VI in 2 cases,

( 0.98 %) as observed in the Baloch study which reported a low incidence of 9.7% cases and 7% of cases under CAT IV and CAT VI respectively.<sup>3</sup>

## Summary and Conclusion

This is a retrospective observational study of the thyroid FNACs done at CMCH&RC, Irungalur, Trichy in the years 2009 and 2015.

A total of 222 patients and 204 patients had undergone Fine needle aspiration for thyroid lesions in the year 2009 and 2015 respectively. Thyroid pathology falling under CAT II of BSRTC was the most common in both years with Thyroiditis being the most common lesion.

A striking female preponderance was observed in 2009 and 2015 and it was also noticed that the female to male ratio of patients had drastically changed from 6:1 to 32:1 between 2009 and 2015 showing a rising incidence of thyroid pathology in females.

Similarly the cases grouped under neoplastic Categories IV, and VI had also markedly reduced since 2009, Cat IV lesions accounted for 18% followed by

Cat VI 12% in 2009 but in 2015, cases with CAT IV lesions were 2.9 % and CAT VI only 0.98 %.

This reduction in the neoplastic lesions may be attributed to the early detection of thyroid enlargement and timely interventional management and awareness regarding Deficiency -related thyroid pathology.

### Limitations of the Study

The study is purely an observational study based on the records collected from the institutional database and since this is a tertiary hospital patient followup is not adequate and hence histopathological evaluation of the cases was not available aplenty to correlate with the cytology.

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