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Cytomorphological Evaluation And Thyroid Function Test (Tft) Analysis In Various Thyroid Diseases “Our Experience At Tertiary Care Centre”

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Abstract:

Background – Aim of this study is to evaluate cytomorphological pattern and thyroid hormone profile analysis which provides information about physiological and pathological condition and help in the early detection of various thyroid diseases and there by reduces surgical intervention . Objectives – 1.To obtain the results of fine needle aspiration cytology (FNAC) and thyroid hormone profile in diagnosis of different benign lesions and neoplastic lesions. 2. confirmation of clinically diagnosed neoplastic lesions. Materials and Method – During the study period June 2013 to May 2014 Fine needle aspiration cytology (FNAC) was performed on 198 patients with clinical history of thyroid diseases Thyroid function test also performed whenever possible. Results –One ninety eight cases both males and females were analysed. Analysis of thyroid hormone profile was possible in 147 cases, age range in this study was 1-80 years. Most commonly affected age group was 3rd to 4th decades. There were 171 (86.36%)females and 27(13.64%) males. Most commonly encountered lesion was colloid goiter accounting for 101 cases. There were 188 non neoplastic lesions and 10 cases were found to be neoplastic. Maximum number of patients, 99 cases were euthyroid followed by hyperthyroid (22 cases) and hypothyroid (19 cases). Conclusion – Fine needle aspiration cytology (FNAC) and thyroid hormone profile are highly effective procedure for the assessment of patients with thyroid lesions. All type of thyroid lesions must be analysed in the light of clinical picture , FNAC and thyroid hormone profile to minimize the risk of false negative report. Early and accurate diagnosis of different thyroid lesions minimize surgical intervention and there by morbidity and mortality.

Keywords: FNAC thyroid ,Thyroid hormone profile.

I. INTRODUCTION

Fine needle aspiration cytology of thyroid is a well established out patient department procedure used in primary diagnosis of thyroid swellings. Fine needle aspiration cytology by giving direct morphological information often bridges the gap between clinical findings and

laboratory test to give a definite diagnosis and subsequently reduce the need of surgery [1]. Definite cytological and clinical criteria have been outlined to distinguished various types of thyroid lesions .[2,3] Fine needle aspiration cytology has accuracy rate exceeds 92%. [6]

Fine needle aspiration cytology is simple, cost effective, accurate, readily repeatable and quick to perform procedure in the out patient department with excellent patient compliance. Important factor for the satisfactory test includes representative specimen from the swelling. It is often used as the initial screening test for diagnosis of thyroid nodule. [4] Fine needle aspiration cytology is considered the gold standard diagnostic test in the evaluation of a thyroid nodule and other test like ultrasound and nuclear scan should be used in conjunction with fine needle aspiration cytology [4]. Thyroid nodules are very frequent, with a number of studies showing an annual incidence rate of 4-8%. [5]

3%-16% of patients who undergo thyroidectomy for benign disease are found to have incidental malignancies, mostly small papillary carcinomas less than 10 mm in size. [6] Despite high prevalence of thyroid nodule and incidental malignancies, the prevalence of clinically overt thyroid carcinoma is much lower. [7] Therefore the routine use of fine needle aspiration cytology in the assessment of thyroid nodule has reduced the number of patient subjected to thyroidectomy for benign diseases of the thyroid. [8]

Thyroid diseases are more common in women and the incidence increases with age, a history of radiation exposure and a diet containing goitrogenic substances. Most of the swellings are non neoplastic lesions. However the distinction of these benign lesions from the malignancy can not be based reliably on the clinical presentation only. Several diagnostic tests such as radionuclide scanning, high resolution ultrasonography (USG), and Fine needle aspiration cytology has been used to select the patient population requiring surgical intervention. Recent studies have demonstrated

that among all these diagnostic modalities Fine needle aspiration is the most accurate, cost effective simplest screening test for rapid diagnosis of thyroid swellings. [1]

In this present study findings of cytomorphological features of thyroid FNAC were compared with thyroid function test analysis.

II. MATERIAL AND METHOD –

The present study was conducted at the department of pathology Gauhati Medical College and Hospital Guwahati from June 2013 to May 2014. A total 198 cases were analysed during this period. All patients both male and female in the age group 1-80 years attending various departments of Gauhati Medical College and Hospital having thyroid swellings who were referred to the pathology department for FNAC were analysed.

Prior to aspiration, a physical examination was carried out to note the mobility of the thyroid swelling during swallowing and presence of any cervical lymph node. All aspiration were done by cytopathologists to ensure representative sampling.

The patients were asked to lie down with a pillow beneath the chest for better visualization of the gland. Using sterile precautions FNAC was performed using nonaspiration or aspiration techniques by 23G needle with 10 ml syringe. If the swelling was cystic, the cyst fluid was collected in the syringe for the preparation of smears after centrifugation. The smears were either air dried or alcohol fixed (95%). Air dried smears were stained by the MayGrunwald Giemsa stain while alcohol fixed smears were stained by the Papanicolaou method.

III. RESULTS AND OBSERVATION-

The study was conducted in the Gauhati Medical college and hospital from June 2013 to May 2014. A total 198 cases of thyroid swellings were analysed. In this study total numbers of female was 171 (86.36%) while males were 27 (13.64%). Female is to male ratio is 6.3 : 1 .The age of the youngest patient was 12years.

Table 1 : Age wise distribution of Cases

Age	Male	Female
11-20	0	5
21-30	3	15
31-40	6	36
41-50	5	52
51-60	4	37
61-70	6	20
71-80	3	6
Total	27	171

In this study we found that most of the patients are female and most common age group affected is 31- 40 (4th decade).Out of 198 cases 186 patients clinically presented with neck swelling, 10 patients presented with history of neck pain and only 2 patients presented with neck discomfort. Of these 198 cases 30 patients had less than one month duration of complain, 33 patients had complains of 1-12 months, 50 patients had 1-2 year duration of swelling and 85 patients had complains of >2 years.Most of the patients in this study gives history of > 2 years of complain.

Distribution of cases according to site of involvement shows right lobe involvement is more than left lobe and isthmus involvement. In

this study number of cases with right lobe involvement was 98,left lobe involvement in 64cases ,both right and left lobe involvement in 22 cases and isthmus involvement 14 cases.

In the present study we found 188 (94.95%) benign lesions and 10 (5.05%) neoplastic lesions .

Table 2: Distribution of Cases according to Cyto-Diagnosis

S.no	Cyto-diagnosis	No. of cases	Percentage	Cyto-diagnosis	No. of cases	Percentage
1	Goitre	101	51	Follicular neoplasm	2	1.01
2	Cystic lesion	3	1.52	Hurthle cell neoplasm	1	0.51
3	Thyroglossal cyst	1	0.5	Papillary carcinoma	4	2.02
4	Adenomatoid nodule	32	16.16	Medullary carcinoma	1	0.51
5	Hashimoto's thyroiditis	15	7.58	Anaplastic carcinoma	2	1.01
6	Lymphocytic thyroiditis	10	5.05			
7	Subacute thyroiditis	16	8.08			
8	Primary hyperplasia	10	5.05			

Out of 198 cases of different thyroid diseases most common lesion is the goitre (51.0%). Out of 10 neoplastic lesions most commonly encountered neoplasm is papillary carcinoma. Histopathology was available in 4 cases (2 follicular neoplasm, 2 papillary carcinoma). Follicular neoplasm one turned out to be follicular adenoma another one is nodular goitre. Histology of 2 cases of papillary carcinoma was consistent with cytological diagnosis.

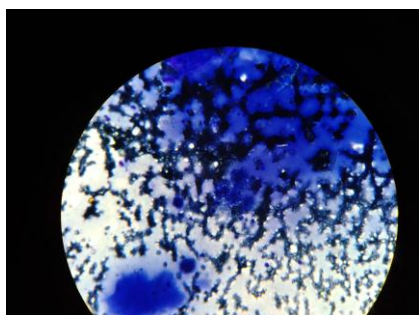
In the present study out of 198 cases of different thyroid diseases thyroid function test was available in 147 cases .Out of these 140 non neoplastic cases and 7 neoplastic cases.

Table : 3 Distribution of Cases according to Hormonal Status

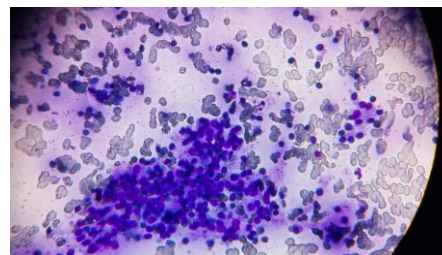
S.No	Hormonal Status	Non-neoplastic	Percentage	Neoplastic	Percentage
1	Euthyroid	99	67.35	5	3.4
2	Hypothyroid	19	12.93	2	1.36
3	Hyperthyroid	22	14.97	0	0
	Total	140		7	

Out of 101 colloid goitre hormonal status was available in 87 cases, 70 cases were euthyroid, 6 cases were hyperthyroid, 11 cases were hypothyroid. Out of 10 cases of primary hyperplasia 6 had hormonal analysis ; 4 were hyperthyroid ,2 were euthyroid. Out of 4 cystic lesions 2 had hormonal analysis ; both the cases were euthyroid. In case of adenomatoid nodule out of 32 cases hormonal analysis was available in 14 cases ; 10 were euthyroid ,3 hyperthyroid 1 hypothyroid. Out of 16 cases of granulomatous thyroiditis 14 had hormonal analysis; 6 hyperthyroid ,2 hypothyroid, 6 euthyroid. Out of 15 cases of Hashimotos thyroiditis 10 had hormonal analysis ;6 euthyroid 3 hypothyroid 1hyperthyroid. We got 10 cases of lymphocytic thyroiditis ,7 had hormonal analysis; 4 euthyroid 2hypothyroid 1 hyperthyroid.

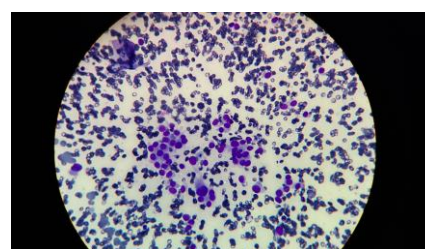
In case of neoplastic lesions out of 10 cases 7 had hormonal analysis ; 5 euthyroid 2 hypothyroid.



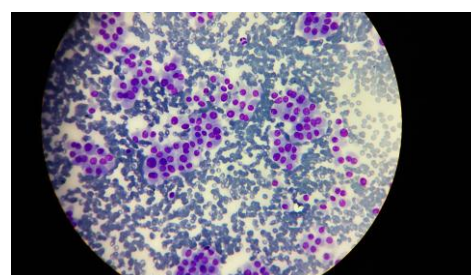
Cytopathology of Colloid Goitre (Low Magnified)



Cytopathology of Lymphocytic Thyroiditis (Low Magnified)



Cytopathology of Follicular Neoplasm (High Magnified)



Cytopathology of Hurthle Cell Neoplasm (High Magnified)

IV. DISCUSSION

Thyroid nodules are very common occurring in 4% of the population aged between 30 and 60.[1] Most of the swellings are benign only between 10% to 20% are malignant .[1,9,10] Thyroid enlargement whether diffuse or in the form of a nodule, leads to a battery of investigations mainly to rule out the possibility of neoplasm or thyroiditis.[8]

Fine needle aspiration cytology (FNAC) is usually the first line of investigation and the other investigations are done subsequently with an aim

to select patient who require surgery and those that can be managed conservatively. Fine needle aspiration cytology is inexpensive, can be performed in a out patient clinic and has few complications including absence of tumor implants along the needle tract.[11]

In the present study age of the patients ranged from 1-80 years. Most commonly affected age group is 31-40 years which is comparable to study done by Monoj Gupta, Sabita Gupta and Ved Bhushan Gupta (2010) [4] and the study done by Bhatia et al 2007 [12]. Female predominance has been observed in present study similar to other studies [8,13,14,15]. In the present study distribution of neoplastic and non neoplastic cases were 4.55% and 94.95% respectively which was similar to studies done by Ritica Choudhary, Zulfikar Ahmed, Umaru N [1] and S. Chandanwale et al [16]. In the present study most common non neoplastic lesion is the colloid goitre which is similar to the studies done by other authors [1,16]. Papillary carcinoma of thyroid is the most commonly encountered neoplasm in our study which is similar to studies done by Chandanwale S. et al [16] and Tabaqchali et al [17]. Follicular neoplasm 2 cases diagnosed cytologically were found to be follicular adenoma and nodular colloid goiter histologically.

Majority of patients (70.95%) both neoplastic and non neoplastic were euthyroid. More than 60% cases of primary hyperplasia were hyperthyroid which is similar to other study [1]. The natural history of chronic lymphocytic thyroiditis is a slow progression to hypothyroidism. [2] Our study show majority of cases of lymphocytic thyroiditis were euthyroid and hypothyroid which is similar to other study [2]. Most of the cases of sub acute thyroiditis were hyperthyroid and euthyroid which is again

comparable to study done by R N Barua and F Zaman [2]. Majority of the cases of colloid goitre and adenomatoid nodule were euthyroid similar to other study [1] and also comparable to FNAC findings.

In the present study we found that most of the neoplastic lesions are euthyroid. No similar study was available for comparison.

V. CONCLUSION-

In our experience Fine needle aspiration cytology (FNAC) is a safe, inexpensive, easy, less time consuming procedure and first line of investigation for evaluation of different thyroid swellings. Together with clinical findings and thyroid function test (TFT) analysis, early and accurate diagnosis of various thyroid diseases is possible which reduces surgical intervention. Again Fine needle aspiration cytology (FNAC) diagnosis of neoplastic lesions is highly significant and such patients should be subjected to surgery.

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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