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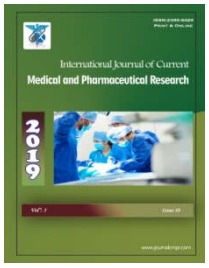

Research Article

A COMPARATIVE STUDY OF FINE NEEDLE ASPIRATION CYTOLOGY (FNAC), BIOCHEMICAL TEST, ULTRASONOGRAM (USG) AND HISTOPATHOLOGICAL EXAMINATION OF THYROID SWELLINGS

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ABSTRACT

Aim: To compare the diagnostic accuracy of preoperative Fine Needle Aspiration Cytology, Thyroid Function Test, Ultrasonography of thyroid swellings with post-operative Histopathological examination results.
Methodology: This study was carried out at Department of Pathology of Sree Balaji Medical College and Hospital during the period of January 2018 to November 2018. Patients of all age groups and both sexes who underwent Fine Needle Aspiration Cytology, Ultrasonography and thyroid function test for thyroid swelling were evaluated. FNAC were compared with the final Histopathological diagnosis.
Results: The sensitivity, specificity and accuracy of the FNAC when compared with HPE were 80 %, 99% and 82% which was compared with other studies of similar parameters.
Conclusion: Fine Needle Aspiration Cytology (FNAC) is the single most important test as well as cost effective diagnostic test for preoperative assessment of thyroid pathology if attention is paid to the clinical features and collection of samples from proper sites and thus avoiding unnecessary surgery.

INTRODUCTION

Thyroid gland is unique among endocrine organs. It is the largest endocrine gland in the body and the first to develop in fetal life.[1] Disorders of thyroid gland are amongst the most common endocrine and surgical problems encountered in clinical practice. The profile of thyroid disorders encountered in pediatric and adolescent age groups in India is similar to that seen in most parts of the world except for the prevalence of IDD in certain endemic regions. The disorders of thyroid gland can be due to inflammatory and neoplastic causes.[2]

Many investigations are used to differentiate between benign and malignant nodule so as to avoid surgery in those who don't need it. Among these Fine Needle Aspiration Cytology (FNAC), Ultrasonography (USG), Thyroid Function test (TFT) are commonly used in association with clinical features but there are drawbacks of each technique. The final diagnostic test is that of histopathological examination (HPE).

The study was carried out with the objective of comparing the findings of USG, FNAC, TFT and HPE of the thyroid swellings and to determine its accuracy.

MATERIALS AND METHODS

This prospective study was carried out from January 2018 to December 2018 in Central Laboratory of Sree Balaji Medical College and Hospital. This study includes a total of 86 patients of all age groups.

For the purpose of inclusion in these study, a thyroid swelling was defined as clinically palpable lesion involving either lobe or the isthmus of the thyroid gland.

Inclusion criteria

Patients with palpable lump without any symptoms
Patients with palpable lump associated with symptoms

Exclusion criteria

Previously diagnosed cases of benign disease and thyroid malignancies Diagnosed cases of carcinoma thyroid on follow up for residual disease or recurrence

A brief history was taken and thorough clinical examination was carried out. FNAC was done in each case and other investigations like TFT & USG details were also collected.[3,4]The swelling was aspirated with 23G needle attached to a 5cc disposable syringe after cleaning and draping the patient.[5,6,7]

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Similarly post thyroidectomy specimens were fixed with 10% formalin. Sections were taken from different parts of the specimen and processed and sections so obtained were stained with haematoxylin and Eosin (HE) staining.[8,9,10]The HPE reports from the patients who underwent surgery were correlated with the findings of FNAC.[11,12]

RESULTS

In this study benign lesions found wereNodular colloid goitre, Thyroiditis, Thyroid cyst and Benign thyroid lesion which constituted 74 (86.05%) cases and Malignant lesions were Papillary carcinoma, Medullary carcinoma and Follicular neoplasm which constituted 12 (13.95%) cases.

DISCUSSION

In the present study age of the patient ranged from 15-70 years with median age of 40 years. Sex distribution of the case numbers was 67 females and 19 males with a ratio of 3.5:1. All cases were evaluated preoperatively and provisional diagnosis was made on the basis of FNAC, TFT and USG.

40 cases out of 86 had done Thyroid function test (TFT). A total of 8 cases showed increased TSH out of which 6 cases were of thyroiditis and 2 cases were nodular colloid goitre.

81 cases out of 86 had done ultrasonography (USG). In the present study, 75cases (92.5%) were reported as benign lesion and 6 cases (7.5%) were reported as malignant lesion by ultrasonography.

USG is considered as first line imaging modality for evaluation of the thyroid gland due to excellent visualization of thyroid parenchyma. It is highly sensitive in detecting small nodules, calcification, septations and cysts as well as in guiding FNA biopsies. The variables considered by several authors to identify malignant lesion includes- hypoechoic nodule, irregular margins, central vascularity and micro calcifications.[13]Considering micro & macrocalcification and increased vascularity as an independent factor for malignant lesion in our case study, it could detect malignancy with sensitivity & specificity of 64% and 81% respectively.

Table 1 Showing FNAC reports in 86 cases

Sr. No	FNAC reports	No of cases	Percentage (%)
1	Nodular colloidal goitre	35	40.7
2	Thyroiditis	5	5.81
3	Thyroid cyst	4	4.65
4	Benign thyroid lesion	10	11.6
5	Carcinomas:		
	Papillary carcinoma	8	9.30
	Follicular carcinoma	3	3.48
	Medullary carcinoma	1	1.16
	TOTAL	86	

Out of 86 cases, 22 cases were operated and specimen was sent for HPE. Preoperatively 7 cases of malignancy were diagnosed while 1 case was missed (were reported on HPE).One case of benign thyroid lesion- nodular hyperplasia of thyroid was found to be papillary carcinoma of thyroid on HPE. It is to be stressed that all malignant cases on FNAC need to surgically treated.

Table 2 Comparison of results of present study with previous studies

Study/year	No of patients	Sensitivity	Specificity	Accuracy
S Gulia et al/2010	140	100%	90%	92.3%
Karki R et al/2012	56	62.69%	100%	82.14%
ChintaVittal et al/2016	100	72%	88%	
Vilas R et al/2018	120		98%	99.15%
Our study/ 2018	86	80%	99%	82%

CONCLUSION

Thyroid nodules are common with prevalence in general population.USG is useful in showing whether the palpable mass is within thyroid or adjacent to it. The sensitivity & specificity of the lesion on sonography correlated with malignancy on FNAC shows a value of 64% and 81% respectively. FNAC is the one of the most recommended diagnostic procedure for the diagnosis of thyroid lesions since it allows the distinction between benign and malignant lesions thus helpinginmaking treatment plans. It should be used as the initial diagnostic test because of its superior diagnostic reliability and cost effectiveness.[14]FNAC has limitations related to specimen adequacy, sampling technique, skill of performing aspiration & overlapping cytological features between benign and malignant follicular neoplasm.
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Our study is in par with other studies and the sensitivity, specificity and accuracy of the test were 80%, 99% and 82% respectively. This study helps to clinician and general physician to know the preoperative evaluation of cases with respect to utilisation of facility like FNAC, TFT, USG and comparing the result with postoperative HPE. Based on the cytological findings patients can be treated accordingly thus avoiding unnecessary surgery.

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