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Original Research Article

Correlation of ultrasonography and fine needle aspiration cytology for diagnosis of malignancy in thyroid lesions: a study of 100 cases

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ABSTRACT

Background: The majority (90%) of thyroid lesions are benign as malignancy occurs only 1 in 10 thyroid nodules. The purpose of ultrasonography (USG) and fine needle aspiration cytology (FNAC) is to pick the patients having malignancy for surgical intervention. The objective of present study is to correlate ultrasonography findings with FNAC for diagnosis of malignancy in thyroid lesions by relating these findings to histopathological examination (HPE) reports.
Methods: A prospective clinical study carried out from September 2019 to February 2021, in the Department of Ear Nose and Throat (ENT), Mamata Medical College, Khammam, in patients with clinical evidence of thyroid swelling. Ultrasound and FNAC were done in all cases and HPE were done in cases where surgeries were performed at our institution. The results were analysed.
Results: According to USG, out of 100 cases 93 cases were found to be of benign thyroid swellings, 4 cases were suspected malignant and 3 cases were found malignant. According to FNAC, out of 100 cases 97 cases were benign and 3 cases were confirmed to be malignant. Two cases which were found to be malignant on both USG and FNAC were confirmed as malignant according to HPE report.
Conclusions: USG is a sensitive modality in the assessment of thyroid swellings with good accuracy. FNAC also provides the most direct and specific information about thyroid lesions. It is suggested that USG followed by FNAC provides better diagnosis in thyroid lesions.

Keywords: Ultrasonography, FNAC, HPE, Thyroid lesion

INTRODUCTION

Thyroid gland is the earliest to develop in the foetus. There is approximately 4-5% incidence of clinically apparent thyroid lesions in general population.[1] The prevalence of thyroid nodules varies from 19 to 67% and increases with age, affecting about 50% of the population older than 40 years of age.[2] Thyroid nodules are more common in females than in males which is about four times**.** Thyroid lesions become vulnerable particularly in countries where iodine intake in diet is low.[3]

The majority (90%) of thyroid lesions are benign as malignancy occurs only 1 in 10 thyroid nodules.[4] Most of thyroid nodules need evaluation to diagnose and treat them at the early stage. A large number of invasive and non-invasive investigations like ultrasonogram (USG), fine needle aspiration cytology and thyroid nuclear scan are available for evaluation of thyroid swellings. The purpose of USG and FNAC is to pick the patients having malignancy for surgical intervention

The majority of thyroid nodules are readily detected by high resolution ultrasound (HRUSG).[5-7] FNAC provides very conclusive information about thyroid lesions. The use of FNAC reduces the number of thyroidectomies by approximately 50%, roughly doubles the surgical yield of

carcinoma and reduces the overall cost of medical care in these patients by 25%.[8,9]

But there are limitations for both USG and FNAC in the diagnosis of thyroid malignancies and still there is a doubt which one is more efficacious.[10] So the present study was aimed to correlate the efficacy of USG with FNAC for the diagnosis of malignancy in thyroid lesions.

METHODS

Present study is a prospective clinical study carried out from September 2019 to February 2021 in the Department of ENT, Mamata Medical College, Khammam. All the patients came to ENT OPD with complaints suggestive of thyroid swelling were enrolled in this study after obtaining written and informed consent. A total of 100 patients were enrolled who met inclusion and exclusion criteria. All the patients were evaluated by detailed clinical history and physical examination, and the patients were sent for USG and FNAC along with thyroid function test. Patient's reports were collected and evaluated.

The HPE reports of patients who underwent thyroid surgery were also collected and interpreted. A preformed proforma was used to record the details of clinical history, physical examination findings and investigation reports. USG and FNAC results were followed up with HPE report.

Patient selection was done by-simple random sampling.

Data was analysed by statistical package for the social sciences (SPSS) computer software.

Inclusion criteria

All patients of both sex with clinically palpable thyroid swellings in lower midline neck or on either side and signs and symptoms suggestive of thyroid disorder (hypo/hyperthyroidism).

Exclusion criteria

Patients who have not given consent, bleeding diathesis patients, patients already diagnosed and treated for thyroid lesion and FNAC showing inadequate aspirated material were excluded from the study.

RESULTS

Out of 100 patients there were 20 males 80 females with male to female ratio 1:4 (Figure 1).

In our study, the youngest patient was 18 years old and eldest person was 65 years. The average age of patients with thyroid lesions according to our study was 33.72 years. So, the thyroid lesions are commoner in females in their active reproductive age group and are uncommon in post-menopausal age group (Figure 2).

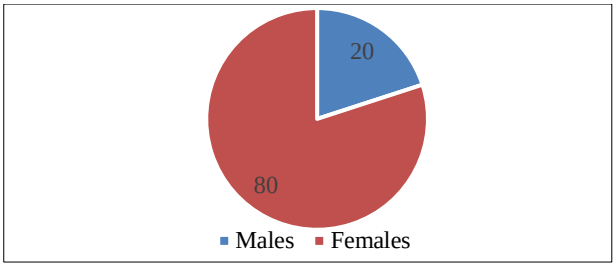

Figure 1: Distribution of sex in the study group (n=100).

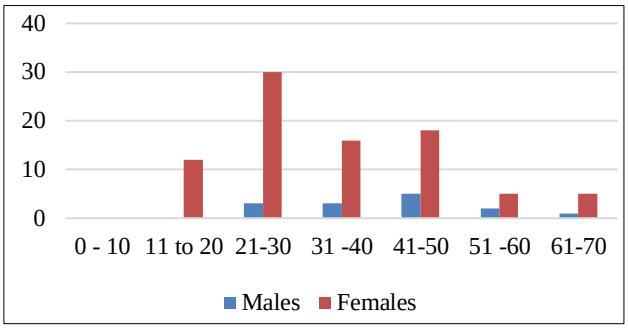

Figure 2: Distribution of age in the study group (n=100).

In present study, out of 100 cases 22 (22%) cases were adenoma, 23 (23%) cases were multinodular goitre, 38 (38%) cases were colloid goitre, 10 (10%) cases were thyroiditis, 4 (4%) cases were suspicious of malignancy, 3 (3%) cases were malignancy. So, in my study most common thyroid lesions were of colloid goitre (Table 1).

Table 1: Distribution of cases according to ultrasound diagnosis.

Ultrasound diagnosis (benign)	No. of cases	%
Non inflammatory		
Adenomatous nodule	22	22
Multinodular goitre	23	23
Colloid goitre	38	38
Inflammatory		
Thyroiditis	10	10
Suspicious of malignancy	4	4
Malignancy/carcinoma	3	3
Total	100	100

In present study, out of 100 cases there were 12 (12%) cases of adenoma, 22 (22%) cases were of multinodular goitre, 37 (37%) cases were of colloid goitre, 10 (10%) cases were of thyroiditis, 3 (3%) cases were of papillary carcinoma, and 16 (16%) cases were of follicular neoplasm (Table 2).

In our study, out of 100 cases 93 (93%) cases were benign according to USG and out of 100 cases 97 (97%) cases were benign according to FNAC. 4 (4%) cases were

suspicious of malignancy in USG which were not confirmed by FNAC and 3 (3%) cases were malignant according to USG which were confirmed as malignant by FNAC (Table 3).

Table 2: Distribution of cases according to FNAC diagnosis.

Benign	No. of cases	%
Non inflammatory		
Adenoma	12	12
Multinodular goitre	22	22
Colloid goitre	37	37
Inflammatory		
Thyroiditis	10	10
Malignant	3	3
Papillary carcinoma		
Follicular neoplasm	16	16
Total	100	100

Table 3: Correlation of USG and FNAC diagnosis.

Diagnosis	USG	FNAC
Benign		
Inflammatory	10	10
Non inflammatory	83	87
Suspicious of malignancy	4	0
Malignancy	3	3

DISCUSSION

Ultrasound of thyroid gland is non-invasive, economically cheap diagnostic tool for evaluation of thyroid swellings and it is patient compliant procedure. 12 MHz transducer can be used for high resolution imaging. But American thyroid association and national comprehensive cancer network states that FNAC should be used as the initial diagnostic test because of its superior diagnostic reliability and cost effectiveness before USG.[11] FNAC is result deciding procedure, which aids in investigating thyroid lesions and assisting clinician in choosing the further mode of treatment. It is the preferred investigation for quick evaluation of thyroid nodules and differentiating between benign and malignant lesions.

But pitfalls in FNAC of the thyroid as mentioned by Shaha are adequacy, accuracy and interpretation of the sample depends on expertise of the pathologist which may influence the diagnosis.

In present study 100 cases of thyroid swellings were followed up at Mamata Medical College and General Hospital, Khammam and USG was performed for all cases followed by FNAC. FNAC is a method first published by Martin and Ellis was performed by 22–23-gauge needles with 10ml disposable syringe.[12-15] The specimen was placed on glass slides and smeared, wet fixed followed by Papanicolaou's staining. Post thyroidectomy specimens were also fixed with 10% formalin. Sections were taken from different parts of the specimen and processed. The section so obtained were stained with haematoxylin and eosin (HE) staining.[16-18]

In present study, out of 100 cases, according to USG, 93 (93%) cases were found to be of benign thyroid swelling while 4 (4%) cases were suspected to be malignant and 3 (3%) cases were malignant. In addition, diagnosis by FNAC, out of 7 (7%) non-benign lesions 4 (4%) patients were diagnosed to be benign rest 3 (3%) patients were confirmed to be malignant.

In our study 44 cases were undergone surgery at our institution. 2 (2%) cases which were found to be malignant on both USG and FNAC were confirmed as malignant according to HPE report.

Similar study done by Ankush et al have found out of 100 (100%) patients, (66%) benign thyroid swelling by USG while 34% found malignant lesion. In addition, diagnosis by FNAC, out of 66% benign lesions (64%) patients diagnosed as benign, rest (2%) patients were confirmed to be malignant. Out of (34%) malignant lesions diagnosed by USG only (10%) patients diagnosed as malignant, rest (24%) patients confirmed to be benign.[19]

In study of Lokhande et al sensitivity of USG was 71.43% and of FNAC is 75%. These results are similar to present study.[20]

Limitations

Our study had some limitations, as we conducted this study in a tertiary care centre where there were limited resources and the sample size was smaller. So, with larger sample size and increased study duration the conclusions would be better.

CONCLUSION

In our study, there was no significant difference between USG and FNAC in diagnosing malignant thyroid lesions. But USG followed by FNAC increases the accuracy to diagnose thyroid lesions so by which unnecessary thyroid gland surgery can be avoided. So, it is suggested that USG followed by FNAC provides better diagnosis in thyroid lesions.

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