

ORIGINAL RESEARCH

Analysis of Accuracy of Fine Needle Aspiration Cytology of Solitary Thyroid Nodule: Study at a Tertiary Care Hospital

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ABSTRACT

Background: Solitary thyroid nodule is defined clinically as the localised thyroid enlargement with apparently normal rest of the gland. The present study was conducted to assess the accuracy of Fine Needle Aspiration Cytology of solitary thyroid nodule. **Material & Methods:** This descriptive study was conducted to assess the accuracy of Fine Needle Aspiration Cytology of solitary thyroid nodule over a period of 6 months. It included 50 cases of solid solitary thyroid nodule fulfilling inclusion criteria. A detailed history was taken and the patient was thoroughly examined. Fine needle aspiration cytology was performed. The statistical analysis was performed using the statistical program for social sciences (SPSS). **Results:** In this study FNAC of solitary thyroid nodule revealed that 62.83% were nodular goitre, 28.57% were benign cyst among benign lesions and 8.57% were Lymphocytic thyroiditis while 53.33% were follicular carcinoma, 33.33% were papillary carcinoma and 6.66% were Hurthle cell lesion and suspicious of neoplasm respectively. In our study histopathological findings of Solitary colloid nodule were as 71.87%, 21.87% benign thyroid cyst while 50% were follicular adenoma, 22.22% were colloid adenoma. In our study 10% were false negative, 14% were false positive, 36% true negative and 40% cases were true positive. **Conclusion:** The present study concluded that FNAC of solitary thyroid nodule revealed 40% cases were true positive on comparing histopathologically.

Keywords: FNAC, Solitary Thyroid Nodule, Histopathology.

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INTRODUCTION

Thyroid nodule is defined as a focal well-defined area of altered echogenicity within thyroid gland that is radiologically distinct from surrounding normal thyroid parenchyma.¹ Nodular thyroid disease is a common clinical problem with a prevalence of 4%–7% and annual incidence of 0.1% in some adult populations.^{2,3} Nodules are more frequent in females and are mostly benign. Fine Needle Aspiration Cytology (FNAC) has been in use since the 1950s and is a safe, cost effective method of diagnosing thyroid nodules.⁴ FNAC is safe, simple and quick with a low complication rate so considered as the gold standard initial investigation in the diagnosis of thyroid swellings.⁵⁻⁷ With the increase use of imaging over the last decades, the number of incidentally discovered thyroid nodules is rising.⁸ The limitations of FNAC include false positive and false negative results and a minor proportion falls into the intermediate

or suspicious group. Thus the present study was conducted to assess the accuracy of Fine Needle Aspiration Cytology of solitary thyroid nodule.

MATERIALS & METHODS

This descriptive study was conducted in the Department of Pathology, Rama Medical College Hospital & Research Centre, Kanpur, Uttar Pradesh (India) to assess the accuracy of Fine Needle Aspiration Cytology of solitary thyroid nodule over a period of 6 months. Before the commencement of the study ethical approval was taken from the Ethical committee of the institute and informed consent was taken from the participants after explaining the study. It included 50 cases of solid solitary thyroid nodule fulfilling inclusion criteria. Both male and female patients, all age groups, solitary thyroid nodule were included in the study. Non-thyroidal neck masses, Diffuse goiter and Multinodular goiter were excluded

from the study. The diagnostic criterion for solitary thyroid nodule was the triple assessment including clinical, radiological and tissue diagnoses. A detailed history was taken and the patient was thoroughly examined. Mucosal lining of upper aero-digestive tract was examined and systemic examination was also carried out. Routine investigations were performed in all cases. Ultrasonography, radioiodine scan, thyroid function tests, computed tomography, MRI and endoscopy were done when indicated. Fine needle aspiration cytology was performed in all cases by the same cytopathologist. Thyroid surgery was performed and specimens were examined by the same histopathologist. The statistical analysis was performed using the statistical program for social sciences (SPSS).

Table 1: FNAC of thyroid nodule

Diagnosis	No. of patients	Total (%)
Non neoplastic lesions		35(70%)
Nodular goitre	22(62.83%)	
Benign cyst	10(28.57%)	
Lymphocytic thyroiditis	3(8.57%)	
Neoplastic lesions		15(30%)
Follicular carcinoma	8(53.33%)	
Papillary carcinoma	5(33.33%)	
Hurthle cell lesion	1(6.66%)	
Suspicious of neoplasm	1(6.66%)	

Table 2: Histopathology of thyroid nodule

Diagnosis	No. of patients	Total (%)
Non neoplastic lesions		32(64%)
Solitary colloid nodule	23(71.87%)	
Benign thyroid cyst	7(21.87%)	
Ch.Lymphocytic thyroiditis	1(3.12%)	
Hashimoto's thyroiditis	1(3.12%)	
Neoplastic lesions		18(36%)
Follicular adenoma	9(50%)	
Colloid adenoma	4(22.22%)	
Papillary carcinoma	2(11.11%)	
Hurthle cell adenoma	1(5.55%)	
Follicular carcinoma	1(5.55%)	

Table 3: Diagnostic comparison between FNAC and histopathology for solitary thyroid nodule

Test result	N(%)
True Positive	20(40%)
False Positive	7(14%)
True Negative	18(36%)
False Negative	5(10%)

DISCUSSION

Fine needle aspiration cytology is regarded as the gold standard initial investigation in the diagnosis of thyroid swellings. The technique is safe, simple and quick with low complication rates. Several other tests such as high-resolution ultrasonography, radioisotope scanning and FNA biopsy have been used for evaluation of thyroid swellings before proceeding to thyroid surgery. Studies have demonstrated that among all these diagnostic modalities, FNAC is the

RESULTS

Our study included 50 cases of solitary thyroid nodule in which 30 were females and 20 were males. In this study FNAC of solitary thyroid nodule revealed that 62.83% were nodular goitre, 28.57% were benign cyst among benign lesions and 8.57% were Lymphocytic thyroiditis while 53.33% were follicular carcinoma, 33.33% were papillary carcinoma and 6.66% were Hurthle cell lesion and suspicious of neoplasm respectively. In our study histopathological findings of Solitary colloid nodule were as 71.87%, 21.87% benign thyroid cyst while 50% were follicular adenoma, 22.22% were colloid adenoma. In our study 10% were false negative, 14% were false positive, 36% true negative and 40% cases were true positive.

most accurate and cost effective screening test for rapid diagnosis of thyroid swellings.⁹⁻¹¹

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respectively. In our study histopathological findings of Solitary colloid nodule were as 71.87%, 21.87% benign thyroid cyst while 50% were follicular adenoma, 22.22% were colloid adenoma. In our study 10% were false negative, 14% were false positive, 36% true negative and 40% cases were true positive. Wahid FI et al evaluating these nodules by FNAC is to identify nodules with malignant potential and get prompt management of them, considering the limitations of open biopsy and advantages of FNAC. This study included 82 cases consisting on 57 female and 25 male, with female: male ratio of 2.28: 1. The age of the patients was ranged from 16-65 years with mean age of 42.56 + S.D 11.60 years. Most of the patients presented in 3rd and 4th decade followed by the 5th and 2nd decade. The diagnostic yield of Fine Needle Aspiration Cytology (FNAC) in this study was accuracy 82.92%, sensitivity 88.09%, specificity 77.50% and positive predictive value was 80.43%.¹² Kumar revealed sensitivity and specificity of 77% and 100% respectively (24). In Moosa study the yield of FNAC was as follows: sensitivity 77.7%, specificity 98.9%, positive predictive value 87.5% and negative predictive value 97.8%.¹³ El Hennawy HM et al compared the accuracy of FNAC in diagnosis of thyroid nodules in Al Khor community hospital versus that of tertiary hospital (Hamad General Hospital) in Qatar. Free hand FNAC in group A and group B achieved a sensitivity of (10% vs. 50%), specificity of 93% in both groups, positive predictive value of (25% vs. 17%), negative predictive value of (82% vs. 98%), and a total accuracy of (82% vs. 94%) respectively, while US guided FNAC in group A and group B achieved a sensitivity of (10% vs. 86%), specificity of (98% vs. 94%), positive predictive value of (50% vs. 60%), negative predictive value of (86% vs. 98%), and a total accuracy of (85% vs. 97%) respectively.¹⁴

CONCLUSION

The present study concluded that FNAC of solitary thyroid nodule revealed 40% cases were true positive on comparing histopathologically.

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