Assessment of the Diagnostic Accuracy of Thyroid Lesions by FNAC

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Research Article

Abstract: **Introduction:** Fine needle aspiration cytology has become an accepted and cost effective procedure for rapid diagnosis of thyroid lesions It's a simple, noninvasive technique with minimal complications. This procedure was firmly established as an important test for the evaluation of thyroid disease and an effective test for the preoperative diagnosis of thyroid nodule. **Objectives:** To assess the diagnostic accuracy [sensitivity, specificity, positive predictive value (ppv) and negative predictive value(npv)]. **Materials and Methods:** During the prospective study, 110 fine needle aspiration of thyroid was performed during a period of two years (2008-2010) in department of pathology, Navodaya Medical College, Raichur. Cytological diagnoses were classified diagnostically, and histological and cytological correlations were determined and diagnostic accuracy of FNAC in thyroid lesions is studied and statistical analysis was performed. **Results:** Out of the 110 patients studied, 100 cases were of non neoplastic thyroid lesions, 10 were neoplastic. In Histopathological examination of non neoplastic category out of 5 cases 1 were diagnosed as follicular adenoma which were diagnosed as nodular goitre by FNAC. In neoplastic category 4 showed follicular adenoma and 2 cases as nodular goitre out of 6 which was diagnosed as follicular neoplasm in FNAC. Papillary carcinoma (3 cases) and medullary carcinoma (1 case) were diagnosed same as FNAC results. **Interpretation and Conclusion:** By comparing the results of FNAC and histopathology, FNAC has sensitivity of 88.88% and specificity of 66.66% in the diagnosis of malignant thyroid diseases. Although histopathology is a gold standard procedure, FNAC of thyroid lesions has got good sensitivity and specificity.

Keywords: Fine needle aspiration cytology, thyroid lesions, sensitivity, specificity.

Introduction

Thyroid nodules are a source of concern for the patients and a diagnostic dilemma for physicians[1]. The prevalence of patients with thyroid nodules ranges from 4- 25%.[2] The vast majority of nodules are non-neoplastic or benign neoplasms[3], whereas 5-10% are estimated to be malignant nodules[2].FNAC of the thyroid gland is now a well established,[4] most important modality[5] and first line[4], preoperative and pathological[6] diagnostic test, for the evaluation of diffuse thyroid lesions as well as of thyroid nodules, [4]as it is a rapid, inexpensive investigation and has high diagnostic accuracy.[5] Different imaging techniques are now used for preoperative diagnosis of thyroid nodules like radionuclide scanning, high resolution Ultrasonography etc. However, rapid assessment and accurate diagnosis of fine needle aspiration smears has become increasingly popular due to the global trend in reducing health care costs.[6] Hence, this study is undertaken to evaluate the diagnostic accuracy [sensitivity, specificity, positive predictive value (ppv) and negative predictive value(npv)] of FNAC of thyroid lesions.

Methodology

The present study was undertaken to analyze the cytology of palpable thyroid lesions and compare them with histopathology wherever possible, to determine its diagnostic accuracy. All the patients referred to FNAC of thyroid lesions were studied prospectively for a period of two years in Department of Pathology, Navodaya Medical College Raichur. All the patients were clinically examined in detail according to the proforma and a careful palpation of the thyroid was done to guide precisely the location for doing aspiration. Details of the procedure were explained to the patients and the procedure was performed under aseptic precautions. Smears were studied and evaluated.

Cytological diagnosis was correlated with the histopathology and accuracy of FNAC was estimated by using the methodology of Galen and Gambino.

Results

In present study out of total 110 cases 15 cases were subjected to histopathological correlation, 12 cases showed correlation while 3 cases were not correlated. In the study, 76 cases were diagnosed as nodular and colloid goiter; histopathological studies were available in 5 cases. Four cases proved to be same in the tissue section. In one case because of the rich cellularity and scant colloid on smear, the case was allowed for histopathological

examination, and was finally diagnosed as micro-follicular adenoma. In the present study, 6 cases were diagnosed as follicular neoplasm on cytology. Histopathology study was possible in all 6 cases that showed 4 cases as follicular adenoma whereas 2 cases were initially diagnosed as follicular neoplasm on cytology, as the smears showed features like rich cellularity and focal micro-follicular pattern of arrangement of the cells and when compared with histopathology, these cases were diagnosed as nodular goiter. In the present study cytological diagnosis of papillary carcinoma was made in 3 cases and medullary carcinoma in 1 case. All the cases were subjected to histopathological correlation and found to be 100% correct. In this study, there were 4 true negatives, 8 true positive, 1 false negatives and 2 false positive. This gives sensitivity of 88.88 %, specificity of 66.66%, positive predictive value of 80%, a negative predictive value of 80% and accuracy of 80%in neoplastic lesions and 66.66% and 88.88% of sensitivity and specificity respectively in benign lesion, other parameter like PPV, NPV and accuracy remain same as neoplastic lesions. The results were similar when compared to the study by Gupta M *et al* (2010) with specificity, accuracy, positive predictive value and negative predictive value while sensitivity was higher compared to present study in neoplastic lesions.

Table 1: Comparison of statistical values of this study and other studies

Author and year	Positive PV	Negative PV	Sensitivity	Specificity	Accuracy
Gupta M *et al* 2010[08]	80%	86.6%	80%	86.6%	84%
Nart d *et al* 2010[09]	80%	72%	43%	68%	73%
Burch HB *et al* 1995[10]	55.8%	90%	80%	73.2%	75.2%
Mundasad B *et al* 2006 [11]	38.4%	90.4%	52.6%	86.6%	94.2
Present study 2010	80%	80%	66.66	88.88	80%

Conclusion

Fine needle aspiration is an easy technique of obtaining material for cytological examination, with little discomfort to the patient. The rapidity, reliability, reproducibility and low cost of the method, are the main merits of its popularity as an accepted method for the diagnosis of various thyroid lesions. All the fine needle aspiration diagnosis must be viewed in the light of the clinical picture and other investigations to minimize the risks of a false- negative report.

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