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THE YIELD OF FNAC IN THYROID NODULE

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ABSTRACT:

Objectives: To assess the diagnostic yield of FNAC in patients presenting with cold thyroid nodules and to identify features that might be useful for making practical decisions about their management.
Study Design: Retrospective, descriptive.
Place and Duration of Study: Department of Ear, Nose, Throat, Head & Neck Surgery, Dow University of Health Sciences and Civil Hospital Karachi during 2008 to 2010.
Subjects and Methods: Total of 90 cases who presented with thyroid nodule in out patient department was included in this study. Out of 90 cases, 30 were excluded from the study either because histopathological confirmation could not be obtained or the aspirate sent for cytopathological study was unsatisfactory for diagnosis. Remaining 60 cases were included in this study. These cases were subjected to radio- isotope scanning and FNAC was performed on those showing cold nodules. The yield of FNAC was later correlated with the histopathological reports of the excised thyroid specimens.
Results: Out of 60 cases included in the study 08(13.3%) were males and 52(86.6%) were females. The cases were divided into 6 groups according to age with peak incidence in Group II comprising 33.3% and least incidence in Group VI comprising 3% of the subjects. The accuracy of FNAC was determined as a percentage of correct diagnosis made by this technique compared to the final diagnosis established on histopathology report. In this study accuracy of FNAC was found to be 96.6%. Sensitivity was 91.6% and specificity was 81.6%.
Conclusion: FNAC of thyroid nodule is sensitive, specific, accurate, rapid, minimally invasive and cost effective. It is the first line procedure in the evaluation of thyroid nodules. FNAC sample results accurately predict the diagnosis and are suggestive of appropriate treatment in most cases. However, atypical FNAC results need to be considered in combination with clinical presentation, imaging data and individual patient risk factor.

Key words: Thyroid nodule, FNAC, Histopathology.

INTRODUCTION:

Nodular goiter is the world most common endocrine disorder affecting about 580-600 million people [1]. Thyroid disease includes single and multiple palpable nodules[2]. Solitary nodule is a discrete swelling in otherwise impalpable gland, whereas swelling in a clinically multinodular gland is termed as dominant.

The commonest cause of thyroid enlargement is iodine deficiency. Insufficient dietary iodine intake leads to inadequate release of thyroid hormones. Thyroid cancer is characterized by lack of affinity for radio-iodine, so thyroid scanning following radio- iodine or technetium can provide functional status of thyroid nodule. Thyroid scan differentiates cold nodules from hot nodules which are less likely to be malignant than the former ones. The life time risk of developing thyroid nodule is estimated to be 10%[3]. Approximately 275,000 thyroid nodules are detected per year of which about 1400 are thyroid cancers[4]. Thyroid nodules are more likely to be malignant in males than in females[5]. Patients younger than 20 years of age or older than 60 years of age are more likely to have

malignant nodules[6]. Thyroid carcinomas estimate about 0.5% cancers in men and 1.5 in women[7].

FNAC is considered the initial, cost effective and reliable test for the diagnosis of thyroid nodules[8]; however, it is less effective in diagnosing the follicular neoplasms. FNAC is recommended for palpable nodules, but the indication for this procedure in non-palpable nodules is a matter of controversy[9], some recommend ultrasonography or CT guided FNAC whereas others consider that clinical follow-up is sufficient in absence history of familiar thyroid cancer or head/ neck irradiation[9]. The information provided by U/S scans can be ascertained by FNAC.

The aim of this study is to evaluate the diagnostic yield of FNAC in patients presenting with cold thyroid nodules and to identify features that might be useful for making practical decisions about their management.

SUBJECTS AND METHODS:

This retrospective study was conducted in the Department of ENT and Head & Neck Surgery, Dow University of Health Sciences and Civil Hospital Karachi, which is a tertiary care hospital serving the patients from all over Sind and parts of Baluchistan. This study was carried out during February 2008 to March 2010.

Total of 90 cases who presented with thyroid nodule in out patient department were included in this study. Out of 90 cases, 30 were excluded from the study either because histopathological confirmation could not be obtained or the aspirate sent for cytopathological study was unsatisfactory for diagnosis.

Remaining 60 cases were included in this study. All the cases underwent complete history taking, physical examination, routine lab tests, hormonal assay i.e. serum T3 T4 & TSH and radioisotope scan. FNAC was performed on all cases showing cold nodules. On the basis of clinical assessment, cases were preoperatively classified into solitary thyroid nodule or mutinodular goiter. The yield of FNAC was later correlated with the histopathological reports of the excised thyroid specimens.

RESULTS:

Total of 60 cases were included in the study. There were 08 males and 52 females with male to female ratio 1: 6. Their percentage distribution was found to be 13.3% and 86.6% respectively.

The cases were divided into 6 groups according to age. Group I comprised of cases under 10 years of age. Group II included subjects from 21-30 years of age. Group III had cases between 31-40 years. Group IV comprised of cases between 41-50 years. Group V was of subjects from 51-60 yrs whereas Group VI comprised of cases between 61-70 years and above.

The peak incidence of thyroid disease was observed in Group II with maximum of 20 cases constituting 33.3%. Group IV was second highest with 14 cases comprising 23.3% whereas Group VI contained least number of subjects constituting 3% on the whole

The study included 90 cases in total. In 10 cases aspirate was found to be unsatisfactory for diagnosis and in other 20 cases surgery was not performed for various reasons. In remaining 60 cases histopathological correlation was available. Amongst these, 49 were reported as benign and 6 as follicular neoplasms on FNAC whereas on histology 47 and 8 were to be so, respectively. FNAC reported 2 cases as suspicious and 03 as malignant which all proved to be malignant on histology.

FIGURE I: GENDER DISTRIBUTION

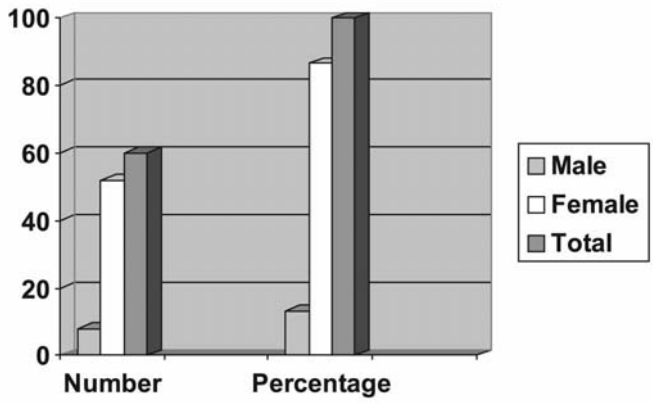
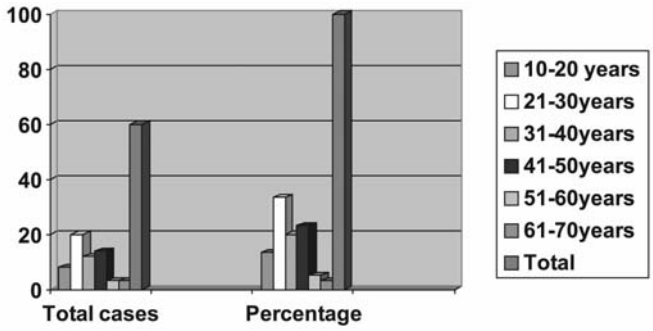


TABLE I: GENDER

Gender	Number	Percentage
Male	08	13.3%
Female	52	86.6%
Total	60	99.9%

FIGURE II: AGE DISTRIBUTION



Age	Male	Female	Total	%
10-20	1	7	8	13.3
21-30	3	17	20	33.3
31-40	1	11	12	20
41-50	2	12	14	23.3
51-60	0	3	3	5
61-70	1	2	3	3
Total	8	52	60	100

The accuracy of FNAC was determined as a percentage of correct diagnosis made by this technique compared to the final diagnosis established on histopathology report. In this study accuracy of FNAC was found to be 96.6%. Sensitivity was 91.6% and specificity was 81.6%. The study affirms the recommendation by Silverman (1986), Fride (1976) Akerman et al (1985), Cusik et al (1990) and La Rosect al (1991).

Our study revealed FNAC superior to other diagnostic techniques for early and correct diagnosis of thyroid nodule minimizing the need of other expensive investigations.

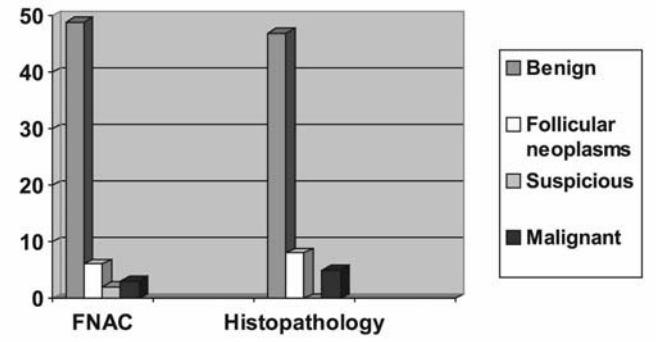
TABLE III: THE YIELD OF FNAC IN THYROID NODULE

Benign	49
Follicular Neoplasms	06
Suspicious	02
Malignant	03
Total	**60**

TABLE IV: RESULTS OF HISTOPATHOLOGY OF THE EXCISED THYROID NODULE

Benign	47
Follicular Neoplasms	08
Suspicious	00
Malignant	05
Total	**60**

FIGURE III: CORRELATION OF FNAC REPORTS WITH HISTOPATHOLOGY REPORTS



DISCUSSION:

Thyroid nodules are a common problem in clinical practice[10-12]. Only 5% of such nodules represent malignant disease[17]. Thus in an effort to avoid unnecessary intervention and associated morbidity, it is critical to accurately identify which nodules require definitive treatment such as surgical resection. Techniques like radio-isotope scan and ultrasound are commonly used, but the information provided is limited to the functional status of the nodule.

There are no specific clinical symptoms which can differentiate benign lesion from malignant. Patients are usually asymptomatic when thyroid nodules are first identified, as most are discovered incidentally[12]. Observation alone is often sufficient for the majority of benign lesions but surgical excision is needed for malignant lesions or benign nodules large enough to cause symptoms of compression. Consequently, many clinician favour an early diagnostic approach to avoid missing a potentially malignant condition, while others favour a more constructive approach because only a relatively small number of patients with nodules are ultimately be diagnosed as having malignant disease. Therefore, accurate diagnostic information may help to avoid the morbidity or mortality of prophylactic surgery in patients with benign disease and observation in patients with malignant disease.

FNAC is an important tool in the treatment of patients with thyroid nodules because it yields an accurate diagnosis upto 80% of the time[13]. Although there are currently no standardized reporting guidelines for the cytopathological diagnosis of well-differentiated cancers by FNAC, there are treatment algorithms that correspond to FNAC results categorized as malignant, benign and indeterminate. Although details of these algorithms differ among treatment centres, malignant nodules are generally treated by surgical resection; benign nodules are treated more conservatively and indeterminate samples present as a challenge that is sometimes solved by repeated biopsies. Several studies have examined the situation in which FNAC results are categorized as suspicious for malignancy for which treatment recommendations range from surgical resection of all suspicious nodules[14] to an individualized approach in which specific cytopathological features and other clinicopathologic features are considered[15, 16].

Simplicity of FNAC is well established since its use on larger scale by Martin and Ellis (1930). It requires no specific equipment that makes it superior to all other diagnostic techniques.

CONCLUSION:

Thyroid nodule disease is common but only a small proportion of nodules are malignant.

FNAC of thyroid nodule is sensitive, specific, accurate, rapid, minimally invasive and cost effective. It is the first line procedure in the evaluation of thyroid nodules.

FNAC sample results accurately predict the diagnosis and are suggestive of appropriate treatment in most cases. However, the treatment of patients with results categorized as atypical is less well defined. Atypical FNAC results need to be considered in combination with clinical presentation, imaging data and individual patient risk factor.

In experienced hands, it is safe and reliable with low insufficient sampling rate, thus allowing correct histopathological diagnosis.

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