Original Article

CYTOPATHOLOGICAL CORRELATES OF FINE NEEDLE ASPIRATION CYTOLOGY IN THYROID NODULES

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INTRODUCTION:

Thyroid belongs to the variety of endocrine glands. It is situated in the neck below the thyroid cartilage consisting of two lobes which are connected with isthmus[1].
In addition to protein synthesis, Thyroid gland is responsible for regulating the body sensitivity to other hormones of metabolism through the production of triiodothyronine and thyroxine[2].
Various disorders of the thyroid gland include hyperthyroidism with overproduction of hormones, hypothyroidism with under-production of hormones, thyroditis and thyroid nodules which are usually benign but may be thyroid cancers. All these disorders may cause the enlargement of the gland known as goiter[3].
Presence of thyroid nodules on the gland is noted in many individuals. Prevalence ranges from 4 to 10 % in the general population[4, 5]. Majority of them are benign producing no symptoms. Only 5 – 30% are malignant. They are observed mostly incidentally. There may be many nodules on the gland called as multinodular goiter. Usually, the clinicians perform fine needle aspiration cytology (FNAC) of these nodules for the diagnosis and further treatment of the patients depends upon the findings[6,7].
Fine needle aspiration cytology is considered to be the "gold standard" in the selection of patients for surgery[7]. It is also a cost effective procedure with less complications. It is often used for the selection of the patients requiring surgical intervention[8]. Its use has significantly increased in the recent years because it provides a screening test for the thyroid nodules preventing the unnecessary thyroid surgery[9].
The objective of this study is to determine various cytopathological correlates of goiter in 84 patients based on their FNAC findings.

MATERIAL AND METHODS:

This is a prospective study of 84 patients who visited the department of surgery National hospital Sargodha from January 2009 to January 2011 with the clinical diagnosis of thyroid nodular disease. All the patients were evaluated by clinical examination followed by laboratory investigations and FNAC. Cytological examination was performed at Aamir clinical laboratory, Chiniot.
FNAC was performed on the patients lying in supine position, after surgical scrub and draping. The thyroid nodules were stabilized by the surgeon using his left thumb & index finger. The area was targeted by using a 23 Gauge (10cc disposable/syringe) needle and the cells were aspirated. These cells were blown over a glass slide & spread with the help of another glass slide. Then the slide was left to air dry. The slides were examined by pathologist after routine staining (Giemsa stain) technique. The reports were then analyzed to make different groups according to age of patients & results of cytology. The results were calculated after entering the data with help of Microsoft SPSS programme.

RESULTS:

During this study period, 84 patients were identified with thyroid nodular disease.
Seven patients were found with thyroid lesions (8.33%) in age group ≤ 15 years. Twenty five patients had the thyroid lesions (29.76%) in age group 16-30 year. While in age group 31-45 year & 46-59 years 33 (39.20%) and 19

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(22.61%) patients had the thyroid lesions (Table I).

Table 1 Distribution of thyroid lesions in various age groups (n=84)

Age group	No. of cases	Percentage
= 15 years	7	8.33
16 – 30 years	25	29.76
31 - 45 years	33	39.28
46 – 59 years	19	22.61

n= total no of cases

Twelve patients (14.28%) from male, seventy (85.71%) from female subjects were identified with thyroid nodular disease (Table.2)

Table 2 Distribution of thyroid lesions in various gender groups (n=84)

Gender	No. of cases	Percentage
Male	12	14.28
Female	72	85.71

n= total no of cases

All the subjects included in this study were distributed according to their presentation. In the study thirteen patients (15.47%) who presented with pain were found to have thyroditis. Fifty Nine patients (70.23%) presenting with neck swelling had the thyroid nodular disease. Out of eighty four individuals, seven patients presenting with fever had the thyroid lesion, Two (2.38%) and three (3.5%) subjects were found with thyroid lesion who were presented with tracheal obstruction and weight loss respectively (Table.3)

Table 3 Distribution of thyroid lesions according to presentation (n=84)

Presentation	No. of cases	Percentage
Pain	13	15.47
Neck swelling	59	70.23
Fever	7	8.33
Tracheal obstruction	2	2.38
Weight loss	3	3.57

n= total no of cases

When distribution of thyroid lesions was made according to FNAC findings, 45 (54.87%) patients were found to have benign disease. While 33 (39.28%) were found to have thyroditis and only 5 (5.95%) with thyroid nodular disease were found to be suspicious of thyroid neoplasia. (Table.4)

Table 4 Distribution of thyroid lesions according to FNAC (n=84)

Characteristic	No. of cases	Percentage
Benign	45	54.87
Thyroditis	33	39.28
Suspicious of neoplasia	5	5.95

n= total no of cases

DISCUSSION:

The nodular disease of the thyroid gland consists of various disorders like solitary nodule, multinodular goiter, thyroditis and thyroid neoplasm. Thyroid nodules are quite common in the general population but most of them are benign[10,11].

Literature review illustrates that the thyroid disorders were mentioned in the history. In the book Susrut Samhita which was written 1500 BC goiter is described as Galaganda. Chines used the burnt sponge and seaweed for the treatment of goiter. During that time, Pliny described the epidemics of thyroid goiter[12]. In 1475, Wang Hei described the anatomy of the thyroid gland. In 1656, Thomas Wharton named the gland as Thyroid[13].

FNAC has been considered as the accurate and less expensive procedure for the thyroid nodular disease. It has been included in the routine evaluation of thyroid nodules. It basically reduces the chances of unnecessary thyroid surgery. Chang et al. observed in their study that percentage of the thyroidectomy has lowered by 25 to 50 % after the use of FNAC[14,15].

In the present study, the age distribution of the patients showed that majority of them was in their third decade of life. This finding is in accordance with the previous studies. [16]Thyroid nodules are noted to be rare in the children reported to be affecting only 2% to 3% of their population. Management of the pediatric patients is difficult. Accurate diagnostic approach is necessary to differentiate between benign and malignant lesion[17].

Gender distribution of the thyroid lesions was also analyzed in the present study. Females were found to be 7 times more affected than the males. These findings correlate with the previous work already reported in the literature. Earlier studies show that thyroid nodules are 4-9 times more common in females than males[18].

FNAC is a good screening test to evaluate the thyroid nodules. Most of these are benign as shown by this study. Previous studies also support this finding. This procedure has evolved as a sensitive test for limiting the incidence of thyroid surgeries[19,20,21].

CONCLUSION:

The recent advances in the utilization of radiological imaging and molecular studies have made improvement in the diagnosis and further management of the patients suffering from thyroid lesions. But the FNAC is an appropriate, non invasive and cost effective procedure which differentiates the benign nodules from the malignant to decrease the number of thyroid surgeries[23].

According to this study more chances of thyroid regions are present in females and the subjects between 31-45 years of age. Most of the nodular lesions are benign while the chances of malignancy are low.

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Submitted for publication: 14.12.2015
Accepted for publication: 25.07.2016