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CYTOLOGICAL PATTERNS OF THYROID LESIONS: A HOSPITAL-BASED STUDY DONE AT DISTRICT HOSPITAL (JLNM) SRINAGAR.

Pathology

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ABSTRACT

BACKGROUND: Most of the thyroid lesions clinically present as thyroid swellings either as thyroid nodules or as diffuse enlargement of the gland itself. Fine Needle Aspiration Cytology (FNAC) is a rapid, easy to perform, minimally invasive and cost-effective first line high diagnostic accuracy test for cytological evaluation of thyroid lesions with minimum complications.. The accurate cytological diagnosis of the thyroid lesions can direct the treatment modalities of the lesions and reduce unnecessary thyroid surgeries.

AIMS AND OBJECTIVES : TO study cytological patterns of thyroid swellings in patients attending a district hospital using fine needle aspiration cytology(FNAC).

MATERIALS AND METHODS: The prospective hospital based study done at district hospital (JLNM) Rainawari Srinagar.The study was based on "FNAC analysis of 51 thyroid lesions presented as thyroid swellings" (study group) in the period of two (01) years from June 1, 2016, to May 31, 2017, in the Pathology Department of JLNM Hospital, Srinagar.

Results and observations: The study included 51 patients. Female patients 35 comprised majority of thyroid lesions , while male patients were 16 of thyroid lesions with a male and female patients ratio of 1:2.18. Maximum patients with thyroid lesions, irrespective of sex in the study group were in the age group of 31-40 years. The youngest patient in the study group was a 15years and the oldest patient in the study group was a 70 years old. Out of 51 thyroid lesions in the study, FNA smears of 06 thyroid lesions were non dianostic . Out of remaining 45 thyroid lesions in the study, which had adequate FNA smears for cytological reporting, there were 29 (64.44) non-neoplastic lesions and 16 (35.55%) neoplastic lesions with a non-neoplastic and neoplastic ratio of 1.81:1. Colloid goitres were the commonest non-neoplastic thyroid lesions in the study.. Malignant tumors were more common neoplastic lesions 9(56.25%) were found to be more common than benign ones (43.75%) with a benign and malignant tumours ratio of 1:1.28 in the study. Follicular neoplasms were the commonest benign tumours and papillary thyroid carcinomas were the commonest malignant tumours amongst the studied thyroid lesions

CONCLUSION: . FNAC is a minimally invasive, highly accurate and cost-effective procedure for the assessment of patients with thyroid lesions. It also helps in differentiating lesions that require surgery from those that can be managed otherwise.

KEYWORDS

Fine needle aspiration cytology; ; thyroid neoplasms; colloid goiter; thyroiditis

Introduction

Thyroid nodules are becoming an epidemic problem in the world in the general population, and have a reported prevalence of 4–7% of adult population. However, fewer than 5% of adult thyroid nodules are malignant, and the vast majority is non-neoplastic lesions or benign neoplasms. [1-3]. The diagnosis of thyroid lesions using aspiration cytology was first reported by Martin and Ellis in 1930.[4] The routine use of fine needle aspiration cytology (FNAC) in the assessment of thyroid nodules has reduced the number of patients subjected to thyroidectomy for benign diseases of the thyroid.[5-8] As a result, the incidence of malignancy at thyroidectomy has increased from 5-10% to 30-50% in the recent years.[9] This relatively simple procedure has assumed a dominant role in determining the management of patients with thyroid nodules.[10,11].

AIMS AND OBJECTIVES

To study the cytological patterns of thyroid lesions by FNAC in patients presenting with thyroid swellings at district hospital JLNM Rainawari Srinagar.

MATERIALS AND METHODS

This prospective study was carried out in Pathology Department of JLNM district hospital Rainawari Srinagar for a period of 1 year from 1 june 2016 to 31 may 2017.The study included all 51 patients who presented with thyroid swellings in pathology department for FNAC. Fine Needle Aspirations (FNA) were done on the thyroid lesions to collect specimens for cytological evaluation using 23/24 gauge disposable needles attached with 10/20 ml airtight disposable syringes according standard operative procedure. Specimens were collected by to and fro motion supplying negative pressure. FNA procedures were performed after detailed clinical history and physical examination of the patients. The aspirated materials from the thyroid lesions were smeared onto clean grease-free glass slides, air dry smears for May-Grunwald Giemsa (MGG) staining and 95% alcohol fixed smears for H & E staining. In case of cystic thyroid lesions, the cysts contents were aspirated, centrifuged, and slides made from the sediment for cytological analysis.The cytological features were evaluated and the reporting was done according to The Bethesda System.

Results; The study included a total of 51 patients that underwent FNAC for evaluation of thyroid lesions presented as thyroid swellings in the Pathology Department of JLNM Hospital, Rainawari Srinagar, during the study period. Out of 51 patients majority were females 35 (68.62%) and 16 (31.37%) were males with male: female ratio of 1:2.18.(fig 1)

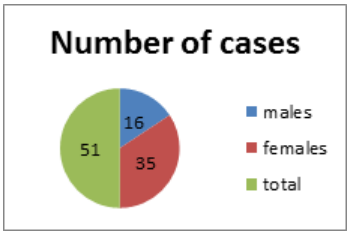

Fig 1 showing gender distribution.

In study period the age range was 15 to 70 years with mean age of 40 years. Maximum patients with thyroid lesions, irrespective of sex in the study group were in the age group of 31-40 years followed by 41-50 years.

Table 1 Age distribution of thyroid lesions (n= 51)

Age	male	Female	total	%age
10-20	0	2	2	3.9
21-30	4	2	6	11.7
31-40	5	12	17	33.33
41-50	4	9	13	25.49
51-60	0	4	4	7.8
61-70	3	6	9	17.64
total	16	35	51	100

Out of 51 thyroid lesions in the study, FNA smears of 06 thyroid lesions showed only colloid with no follicular cells. So 06 thyroid lesions in the study were categorised as non diagnostic or TBSRTC category I. Depending on the cytomorphological features of the adequate FNA smears for cytological reporting of remaining 45 thyroid lesions in the study were classified into two categories: non-neoplastic and neoplastic. Out of the remaining 45 thyroid lesions in the study, which had adequate FNA smears for cytological reporting, there were 29 (64.44%) non-neoplastic lesions and 16 (35.55%) neoplastic lesions with a non-neoplastic and neoplastic ratio of 1.81:1 . fig 2

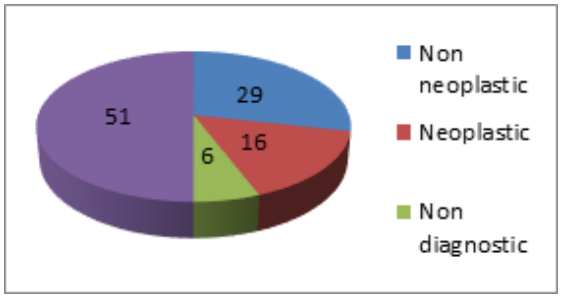

Fig 2 showing distribution of thyroid lesions.

Table 2 Age and sex distribution of thyroid lesions (n= 51)

Age group years	Non diagnostic		Colloid goitre		Thyroiditis		Follicular neoplasm		Papillary carcinoma		Medullary carcinoma		Total	%age
10-20	M	F	M	F	M	F	M	F	M	F	M	F		
		1								1			2	3.9
21-30		1		3		2							6	11.7
31-40		1	4	4		5	1	1		1			17	33.33
41-50	1			4	1	2	1	2	1	1			13	25.49
51-60		1		3									4	7.8
61-70	1			1				2	1	2	1	1	9	17.64
Total	2	4	4	15	1	9	2	5	2	5	1	1	51	100

Among the all thyroid lesions in the study, with adequate FNA smears for cytological reporting, 19 (42.22%) thyroid lesions were goitres with or without secondary changes, Out of the 10(22.22%) thyroid lesions diagnosed as thyroiditis in the study, lymphocytic thyroiditis (04) were the commonest .Among 16 neoplastic lesions 07 (43.75%) thyroid lesions were benign neoplasms, and 09 (56.25%) thyroid lesions were malignant neoplasms. So malignant lesions were common 09 cases (20%) than benign 07 cases(15.55%) with benign to malignant ration of 0.77 : 1. Among benign lesions all 7 cases were follicular neoplasms and in malignant lesions 7 cases were papillary thyroid carcinomas and 2 were medullary carcinomas.

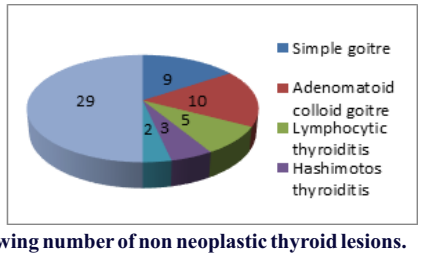

Fig 3 showing number of non neoplastic thyroid lesions.

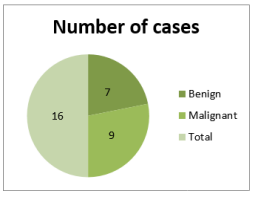

Fig 4 showing number of neoplastic cases

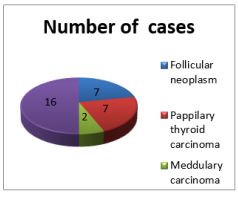

Fig 5 showing cytological diagnosis of neoplastic lesions.

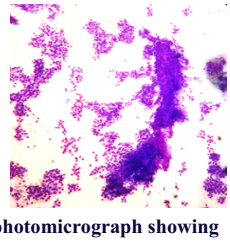

Fig 6 photomicrograph showing papillary

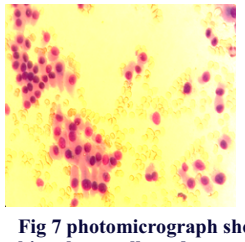

Fig 7 photomicrograph showings binucleate cells and structures with fibrovascular cores in PTC (100X MGG) salt & pepper chromatin in medullary carcinoma (400X MGG)

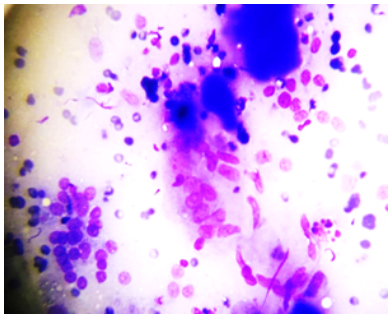

Fig 7 photomicrograph showing epitheloid cell granulomas (400X MGG)

Discussion

Thyroid enlargement, whether diffuse or in the form of a nodule, leads to a battery of investigations, mainly to rule out the possibility of a neoplasm or thyroiditis. FNAC is usually the first line of investigation and other investigations like ultrasound (US) examination, thyroid function tests, thyroid scan, and antibody levels are done subsequently with an aim to select the patients who require surgery and those that can be managed conservatively.[12,13.] Studies have demonstrated that among all the diagnostic modalities, FNAC is the most accurate, cost effective screening test for rapid diagnosis of thyroid swellings [14]. As reported in other literatures, age and gender were associated factors of thyroid lesions [13]. In present study, there was a female predominance giving a female-to-male ratio of 2.18:1, The age of patients ranged from 15 to70 - years, with median of 40 years. which is comparable to many studies in which age ranged from 36.5 to 46.0 years,

Table 3: Comparison of Age Range and Mean Age of Patients of Thyroid Lesions with Other Studies

Authors	Age Range (Years)	Mean Age (Years)
Sathiyamurthy K et al 2014[15]	10-76	36.5
Silverman JF et al 1986[16]	16-79	44.8
Arvinthan T et al 2007[17]	26-59	46.0
Gupta M et al 2010[18]	22-58	38.9
Our study	15-70	40

As in other literature, the benign cases represented the majority of cases (56.86%) [19]. Colloid goitre constituted the majority of benign

lesions (65.51%). Papillary carcinoma was the most frequent malignant lesion, with an incidence of (77.7%), while medullary carcinomas (22.3%) second most common malignant lesions,

Table 3: Comparison of Non-Neoplastic and Neoplastic Thyroid Lesions with Other Studies

Study	Non neoplastic	Neoplastic	Ratio
Silverman JF et al 1986[16]	193	80	2.41:1
Godinho-Matos L et al 1992[20]	109	22	4.91:1
Sekhar A et al 2015[21]	118	31	3.80:1
Our Study	29	16	1.8:1

Fine-needle aspiration cytology has greatly improved the clinical management of thyroid nodules. However, FNA has inherent limitations related not only to inadequate sampling but also, most importantly, to its inability to distinguish between benign and malignant follicular lesions in the absence of nuclear features of papillary carcinoma. The indeterminate diagnosis of follicular neoplasm encompasses a number of heterogeneous thyroid lesions including cellular adenomatoid nodule, follicular adenoma, and follicular carcinoma [22]. Additionally, the interpretation of follicular variant of papillary carcinoma (FVPC) in cytology may be difficult when prominent classic nuclear features of papillary thyroid carcinoma are absent. In such cases, a preoperative diagnosis of 'follicular lesion suggestive of papillary carcinoma'' results in conservative surgical assessment until a definitive diagnosis can determine the appropriate treatment [23]. Another limitation of FNAC is the presence of false negative and positive results particularly with small tumors and when there is associated degenerative or inflammatory change in adjacent thyroid tissue. In addition, there is a group of lesions which overlap benign and malignant features. For instance, the distinction between a cellular colloid goiter and a follicular neoplasm may be impossible [24].

CONCLUSION

FNAC has high sensitivity in cytological diagnosis of thyroid lesions and proper cytological diagnosis may be considered as a primary line of investigation of thyroid lesions and its management. Based on the cytological diagnosis of the thyroid lesions, patients with thyroid lesions may put for surgeries or medical treatments and can decrease the rate of unnecessary thyroid surgeries. This study was a hospital-based study that described the cytological patterns of thyroid lesions that encountered in this institute within the study period and histopathological diagnosis comparison was not done. The limitation of the study was absence of histopathological correlation as all patients were reffered to tertiary care centre for further management. But,with increasing thyroid pathologies, any coastal region falling under the goitrogenic belts, FNAC is recommended to identify the pathological pattern as early as possible to enable a successful outcome.

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