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Original Research Article

Spectrum of Thyroid Lesions and its Clinicopathological Correlation – A Two Year Study from A Tertiary Care Centre

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Abstract
Introduction: *Thyroid diseases are one of the common endocrine abnormality both in India and worldwide. Clinically apparent thyroid nodules are seen in 4-5 % of population. Majority of thyroid swellings are non-neoplastic, only <5 % are malignant. Non-neoplastic diseases of thyroid gland manifests as enlargement of thyroid, altered hormone secretion and its consequences or as both. Papillary carcinoma thyroid is the most common primary malignancy of thyroid. Our attempt was to study the spectrum of thyroid lesions and to correlate histopathological findings with biochemical, radiological & cytological features.*
Materials & Method: *Descriptive study over 2 years where all thyroidectomies received in our department satisfying the inclusion and exclusion criteria were studied and statistically analysed.*
Results: *Thyroid diseases were most commonly seen in 40-50 years of age with females being more affected than males. Multinodular goitre was the most common lesion cytologically, radiologically and histo pathologically. Papillary carcinoma was the most common malignancy detected, most common variant being classic papillary type. Most common associated lesion with papillary carcinoma thyroid was multinodular goitre. Fine needle aspiration cytology and ultrasound showed moderate agreement with histopathology as far as the diagnosis of papillary carcinoma was concerned.*
Conclusion: *Thyroid diseases showed definite female predominance, with most of them occurring in an age group of 30-50 years. Multi nodular goitre remains the most common disease clinically, radiologically and cytologically even after vigorous iodisation programmes. Fine needle aspiration findings and ultrasonogram findings showed moderate agreement with histopathology as far as papillary carcinoma was concerned. Papillary carcinoma was the most common neoplastic disease, with classic papillary variant being most common. Most common associated lesion with Papillary Carcinoma was Multi nodular goitre. This study emphasises the need of periodic evaluation in middle aged female patients with multi nodular goitre for early detection of papillary carcinoma. It also highlights the significance of FNAC as an indispensable tool for early diagnosis of papillary carcinoma. A combined cytological and radiological approach is expected to yield better results.*
Keywords: *goitre, thyroid nodule/ swelling, thyroiditis, papillary carcinoma, FNAC, Thyroid function tests.*

INTRODUCTION

Thyroid diseases comprise one of the most common endocrine abnormality in India and worldwide [1,2]. India owns the largest goitre belt in the sub Himalayan region[1]. Clinically apparent thyroid nodules are seen in 4-5 % of population[3]. Majority of thyroid swellings are non-neoplastic, only <5 % are malignant[4]. Non -neoplastic diseases of thyroid gland manifest as enlargement of thyroid, improper hormone secretion and its consequences or as both. Papillary carcinoma thyroid is the most common primary malignancy of thyroid. The initial screening procedures in thyroid evaluation include ultrasonogram, thyroid function tests, fine needle aspiration cytology and radionuclide scan, among which FNAC is considered the best initial diagnostic procedure[4] . The measurement of thyroid hormones in the blood (serum T3, T4 and TSH) is most helpful for evaluation of hypo and hyperthyroidism, among which the most sensitive one is TSH levels[5]. Grave's disease and Hashimoto's thyroiditis are interrelated autoimmune thyroid diseases with a variety of clinical manifestations, the diagnostic hallmark being anti thyroglobulin antibody and anti-thyroid peroxidase antibody for Hashimotos thyroiditis and antibody to TSH receptor for Graves's disease (TRAB). The prevalence of clinically palpable nodules is only 4 to 7%, ultrasonography is far more sensitive, as it detects nodules of any size in up to 67% of the general population [6]. Ultra sound features suggestive of malignancy include calcifications (microcalcifi-cations called as psammoma bodies), local invasion & direct lymph node metastasis, marked intrinsic hypervascularity and hypoechoic solid nodule [7]. Accurate diagnosis of thyroid nodule is necessary for appropriate clinical management of patients and to avoid unnecessary surgical interventions. Our attempt was to study the spectrum of thyroid lesions and to correlate histopathological findings with biochemical, radiological & cytological features.

AIMS AND OBJECTIVES

To study the spectrum of thyroid lesions & to correlate the histopathology of various thyroid diseases with clinical, radiological and cytopathological features.

MATERIALS AND METHOD

STUDY DESIGN: Descriptive study

STUDY PERIOD: 2 years

STUDY SETTING: Department of Pathology at a tertiary centre in Kerala.

SAMPLE SIZE: All thyroidectomy specimens received in our department during the study period.

INCLUSION CRITERIA: All thyroidectomy specimens received during the study period.

EXCLUSION CRITERIA: Those cases whose anti thyroid antibody levels, thyroid function tests, USG findings and FNA findings were not available.

METHODOLOGY

All the thyroidectomy specimens satisfying the inclusion and exclusion criteria were selected for study after ethical clearance. Gross weight, dimensions, any grey white granular area if present, were noted. Later representative sections were taken which were hematoxylin and eosin stained and studied for microscopic features. The results thus obtained along with patient details were entered in Microsoft excel and further analysis done using SPSS (Statistical package for Social Science) software.

RESULTS

Most common age group affected by thyroid diseases was 40-50yrs followed by 30 to 39 yrs. The mean age was 42.25 years as in table no 1. Thyroiditis was found most commonly in 30 to 50 years while papillary carcinoma was most commonly found in 40 to 50 years. Non-neoplastic diseases were more common than neoplastic ones in all age groups with multi nodular goiter being the most common. Neoplasms encountered were Papillary carcinoma

thyroid followed by follicular adenoma as depicted in table no 2. There was a striking female predominance noted in thyroid diseases with females nine times more affected than males as in figure 1. Papillary Carcinoma was also most commonly seen in females. But in our study, there was no statistical association between the sex and incidence of papillary carcinoma thyroid as in table no 3. According to thyroid function tests, majority of patients with thyroid disease were euthyroid and 33% were hypothyroid as seen in table no 4. The most common thyroid disease diagnosed sonologically was multinodular goiter, as in table no 5. Most common thyroid disease diagnosed by FNAC was colloid goiter, Papillary carcinoma was detected in 9.3% as in table no 6 . Histopathologically the most common thyroid disease was multinodular goiter, Papillary carcinoma constituted 16.1% of thyroid diseases as depicted in figure no 2. Ultrasonogram could predict Papillary carcinoma with moderate agreement taking histopathology as gold standard (table no 7). FNAC findings goes in agreement with histopathology findings as far as Papillary carcinoma thyroid is concerned (table no 8). Papillary Carcinoma was most commonly associated with multinodular goiter (56%). Lymphocytic thyroiditis was associated in 36% cases as seen in table no 9. The most common variant of Papillary carcinoma thyroid histopathologically was classical type (56%), followed by papillary microcarcinoma as depicted in figure no 3.

TABLE NO 1

Age	Count	Percent
<20	4	1.3
20-29	32	10.3
30-39	93	29.9
40-49	102	32.8
50-59	62	19.9
60-69	16	5.1
70-79	2	0.6
Mean ±SD	42.25 ± 10.86	

TABLE NO 2

	MICROSCOPY	<20	20-29	30-39	40-49	50-59	60-69	70+
Neoplastic	Papillary Carcinoma and its variants	1 (2)	9 (18)	13 (26)	15 (30)	9 (18)	3 (6)	0 (0)
	Follicular Adenoma	0 (0)	2 (20)	4 (40)	1 (10)	2 (20)	1 (10)	0 (0)
	Follicular Carcinoma	0 (0)	0 (0)	4 (80)	1 (20)	0 (0)	0 (0)	0 (0)
	Others	0 (0)	0 (0)	0 (0)	1 (33.3)	2 (66.7)	0 (0)	0 (0)
Non Neoplastic	Others	0 (0)	0 (0)	1 (33.3)	1 (33.3)	0 (0)	1 (33.3)	0 (0)
	Multinodular goitre	1 (0.8)	6 (4.8)	35 (28)	47 (37.6)	28 (22.4)	6 (4.8)	2 (1.6)
	Multinodular goitre with cellular nodule	1 (3.7)	7 (25.9)	7 (25.9)	9 (33.3)	2 (7.4)	1 (3.7)	0 (0)
	Cellular nodule	0 (0)	2 (25)	4 (50)	1 (12.5)	1 (12.5)	0 (0)	0 (0)
	Multinodular goitre with thyroiditis	0 (0)	5 (12.2)	11 (26.8)	16 (39)	8 (19.5)	1 (2.4)	0 (0)
	Lymphocytic thyroiditis	1 (5)	1 (5)	8 (40)	2 (10)	7 (35)	1 (5)	0 (0)
	Hashimoto's thyroiditis	0 (0)	0 (0)	6 (31.6)	8 (42.1)	3 (15.8)	2 (10.5)	0 (0)

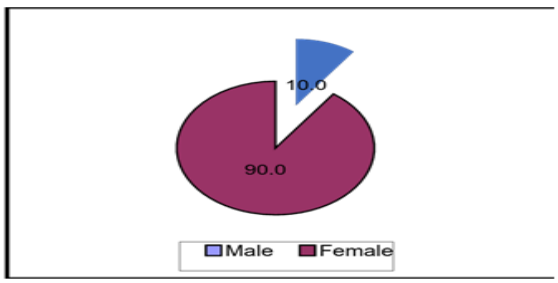

Fig 1

TABLE NO 3

Microscopy	Male		Female		x^2	p
	Count	Percent	Count	Percent		
Papillary carcinoma	6	19.4	44	15.7	0.27	0.601
Others	25	80.6	236	84.3		

TABLE NO 4

TFT	Count	Percent
Normal	198	63.7
Hypothyroid	104	33.4
Hyper thyroid	9	2.9

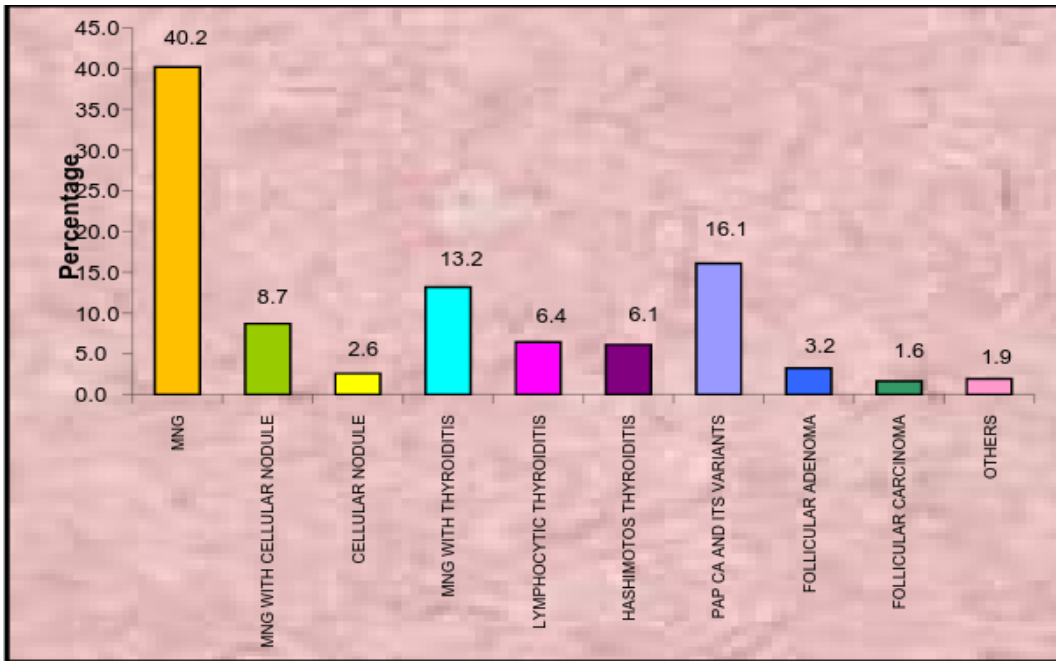

Fig 02

TABLE NO 5

USG Findings	Count	Percent
MNG	189	60.8
THYROIDITIS	43	13.8
MNG WITH THYROIDITIS	18	5.8
BENIGN NODULE/CELLULAR NODULE	13	4.2
FOLLICULAR NEOPLASM	13	4.2
HYPOECHOIC AREAS SUSPICIOUS OF MALIGNANCY	25	8.0
OTHERS	10	3.2

TABLE NO 6

FNAC	Count	Percent
COLLOID GOITRE	191	61.4
LYMPHOCYTIC THYROIDITS	32	10.3
HASIMOTO'S THYROIDITIS	12	3.9
COLLOID GOITRE WITH THYROIDITIS	10	3.2
COLLOID GOITRE WITH CELLULAR NODULE	13	4.2
FOLLICULAR NEOPLASM	18	5.8
PAPILLARY CARCINOMA THYROID	29	9.3
OTHERS	6	1.9

TABLE NO 7

USG	Microscopy		
	Pap ca	Others	Total
Papillary carcinoma	24	1	25
Others	26	260	286
Total	50	261	311

Ultrasonogram goes in moderate agreement with histopathology with a kappa value of 0.6

TABLE NO 8

FNAC	Microscopy		
	Pap ca	Others	Total
Papillary Ca	27	2	29
Others	23	259	282
Total	50	261	311

The agreement of FNAC diagnosis of thyroid lesions with histopathology was found to be 64 % (kappa value 0.64), which shows moderate agreement

TABLE NO 9

ASSOCIATED LESION	Count	Percent
MNG	14	56.0
Lymphocytic thyroiditis	9	36.0
Hashimoto's thyroiditis	2	8.0

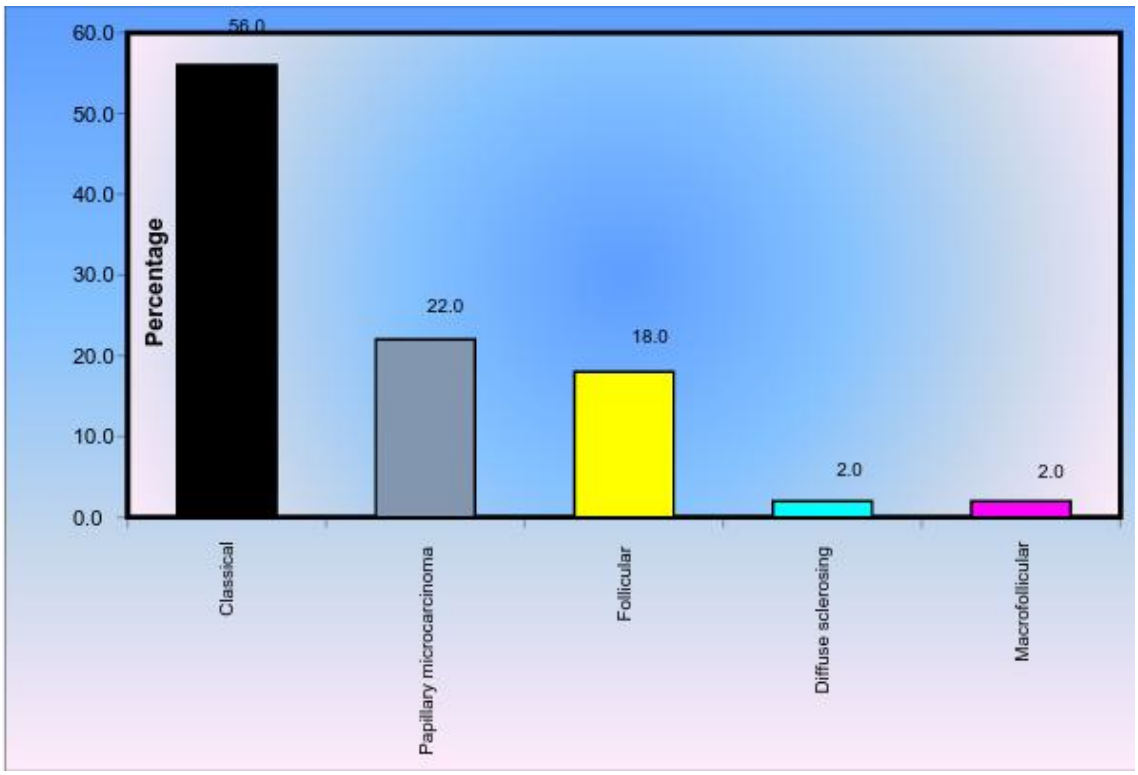

Fig 03

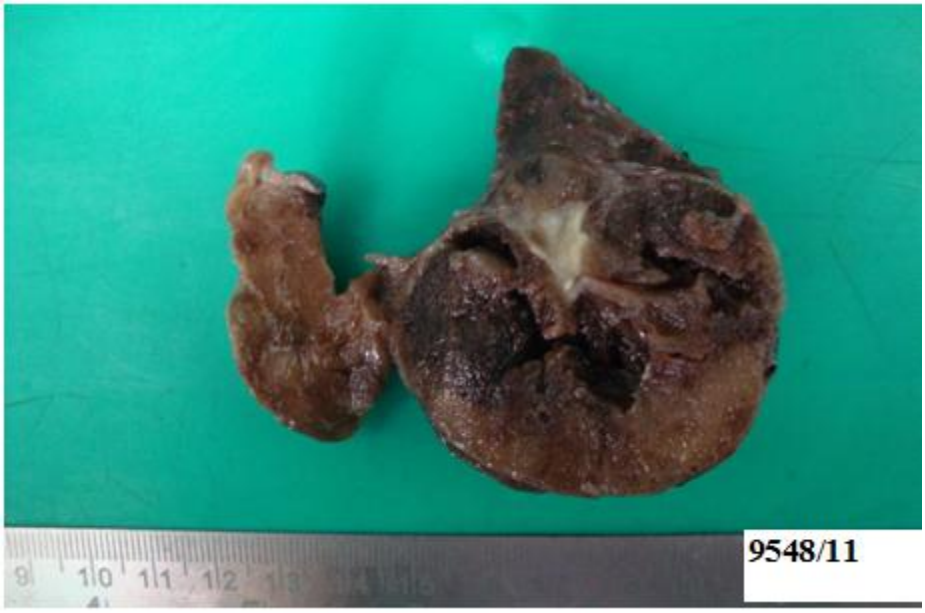

Fig 04 Multi Nodular Goitre

Fig 05 Papillary Carcinoma Thyroid

DISCUSSION

Occurrence of thyroid diseases vary according to different geographical areas, age and sex [(2)]. Inspite of promotion of iodisation, goiter still continues to be a public health problem [(1)]. In our study, we attempted to figure out the histopathological pattern of thyroid diseases in those undergoing thyroidectomies along with their clinical, radiological and cytological correlation. A total of 352 thyroidectomy specimens were sampled. As per exclusion criteria, 41 cases were excluded and a total of 311 cases were analyzed in detail. In the present study, non-neoplastic diseases were common than neoplastic among all age groups as in earlier studies [(8)]. Multinodular goiter was the most common disease diagnosed

clinically, radiologically and by FNAC as comparable to previous studies [8–10]. Thyroid diseases were found to be common at 40- 50 years as proven by studies done earlier [8]. Age group in which thyroiditis was most prevalent was 30-50 years[11,12]. Females were more commonly affected from thyroid diseases with a female to male incidence ratio of 9:1 which was comparable with studies done earlier which also showed striking female predominance [8,9,11,13]. Most of the patients presented in a euthyroid state while a few presented with hypothyroidism which was comparable with studies done earlier [14,15]. FNAC could diagnose Papillary carcinoma considering histopathology as gold standard with a kappa value of 0.64 which showed moderate agreement as in previous study [16]. As proven in previous studies, USG went in moderate agreement with histopathology in diagnosing Papillary carcinoma[17].

Among neoplastic diseases of thyroid, Papillary carcinoma was the most common [10,13,18]. The most common histopathological variant detected was classical type [19]. Previous studies showed association between multinodular goiter and papillary thyroid carcinoma, but the percentage of association was less compared to our study [20].

CONCLUSIONS

Thyroid diseases showed definite female predominance, with most of them occurring in an age group of 30- 50 years. Multinodular goitre remains the most common disease clinically, radiologically and cytologically even after vigorous iodisation programmes. Fine needle aspiration findings and ultra sonogram findings showed moderate agreement with histopathology as far as Papillary carcinoma was concerned. Papillary carcinoma was the most common neoplastic disease, with classic papillary variant being most common. Since the most common associated lesion with Papillary carcinoma was Multinodular goitre, this study emphasises the need for periodic evaluation in middle aged female patients with multinodular goitre for early detection of papillary carcinoma. It also highlights the significance of FNAC as an indispensable tool for early diagnosis of Papillary carcinoma. A combined cytological and radiological approach is expected to yield better results.

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