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Original Research Article

Trends in symptomatology of thyroid malignancy in southern India and the efficacy of targeted fine needle aspiration cytology with ultrasonography guidance in diagnosis

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ABSTRACT

Background: Thyroid cancers are on the rise all over the world. Studies have shown a tripling incidence of thyroid cancer in the United States in the past 35 years. Similar studies from Korea have also shown similar trends of 15 times increase in incidence. This study aims at assessing the recent trends in clinical presentation of thyroid malignancy and the efficacy of ultrasound targeted fine needle aspiration cytology (FNAC) in the diagnosis of thyroid malignancy.
Methods: A cross sectional study was conducted involving 275 patients with thyroid disorders treated in the department of General Surgery at Dr. Somervell Memorial CSI Medical College, Trivandrum, India. Chi-square test was done for statistical test of significance and odds ratio for strength of association.
Results: In this study group, 89% of the patients presented with swelling in front of the neck as chief complaint both in benign and malignancy. Swelling in front of the neck is the predominant symptom in thyroid malignancy. 52% of patients presented with the described symptoms of more than 6 months duration. The specificity of USG guided FNAC is 90% in diagnosing malignancy in goitre in this study group.
Conclusions: The commonest symptom of thyroid malignancy was a painless swelling in the front of the neck. Most common thyroid pathology presenting as thyroid swelling was multinodular goitre. Nearly half of the patients presenting with symptoms more than 6 months had thyroid malignancy. FNAC under ultrasound guidance is an inexpensive accurate and practical investigation for evaluation of thyroid carcinomas.

Keywords: Thyroid malignancy, Goitre, USG guided FNAC

INTRODUCTION

The incidence of thyroid cancers has increased all over the world.[1] Due to the advances in diagnostic technology and improved access to health care facilities, more subclinical cases are also diagnosed. Thyroid diseases including thyroid cancers are common all over the world.[2,3] They constitute some of the most common endocrine malignancies. India too, is burdened with thyroid diseases and thyroid malignancies. Thyroid malignancies are classified as primary epithelial tumours are tumours of follicular cells which are well differentiated known as papillary carcinoma, follicular carcinoma and poorly differentiated are insular carcinoma; undifferentiated are anaplastic carcinoma. Tumours of c cells are medullary carcinoma. Tumours of follicular and c cells are mixed medullary follicular carcinoma.[4] Primary non-epithelial tumours are lymphoma, sarcoma, secondary tumours and metastatic. Ultrasound and fine needle aspiration cytology are two easy investigations for the evaluation of any thyroid enlargement. Thyroid imaging reporting and data system

(TIRADS) is a system of risk stratification for classifying thyroid lesions by ultrasonography (USG). Kwak et al modified the classification proposed by Horvath et al.[5,6]

TIRADS 1: Normal thyroid gland.

TIRADS 2: Benign lesions.

TIRADS 3: Probably benign lesions.

TIRADS 4: Suspicious lesions (sub-classified as 4a, 4b, and later 4c 2 with increasing risk of malignancy).

TIRADS 5: Probably malignant lesions (more than 80% risk of malignancy).

A combination of the ultrasound and targeted FNAC from suspicious focus in the thyroid increases the diagnostic accuracy. This study aims at assessing the trends in clinical presentation of thyroid malignancy and the efficacy of ultrasound targeted FNAC in the diagnosis of thyroid malignancy.

Aims

The aims of the present study were to assess the trends in clinical presentations of thyroid malignancy and to assess the efficacy of ultrasound guided targeted FNAC in the diagnosis of thyroid malignancy.

METHODS

Study design

A cross sectional study was conducted between January 2015 and December 2018 involving cases of thyroid disorders treated in the department of General Surgery at Dr. Somervell Memorial CSI Medical College, Trivandrum, India. The study included 275 patients who consented to participate. Data was collected using a proforma. All patients after collecting detailed clinical history were thoroughly evaluated by general physical examination, thyroid function tests, ultrasound of the neck, USG guided targeted FNAC of the thyroid followed by total thyroidectomy.

Exclusion criteria

Refusal to participate in the study, recurrent thyroid malignancy and severely debilitated patients.

Sample size was calculated using the formula

$$n=\frac{(1.96)^2\times(PQ)}{d^2}$$

Various studies indicate the prevalence of malignancy in thyroid disorders to range between 10-13%.[7,8] We expect the prevalence in our population to be similar with an effect size of 4%. So the expected prevalence of the factor under study i.e., P=13. Q=(100-P). The sample size was calculated using the above mentioned formula.

Ultrasound neck along with ultrasound guided targeted fine needle aspiration cytology was done by an experienced radiologist and a pathologist. The thyroidectomy specimen after surgery was subjected to histopathological examination. Ethical permission was obtained from institutional review board (IRB).

IBM SPSS software was used to statistically analyse the data. Chi-square test was done for statistical test of significance and odds ratio for strength of association.

RESULTS

The study included a total number of 275 patients of which 15 were males and 260 were females.

Table 1: Distribution of symptoms among participants in our study.

Complaints	Number	%
Swelling	245	89.1
Hypothyroidism	11	4
Hyperthyroidism	8	2.9
Obstructive symptoms	11	4
Total	275	100

Table 1 shows that nearly 89% of the patients presented with swelling in front of the neck as chief complaint both in benign and malignancy followed by hypothyroidism and obstructive symptoms.

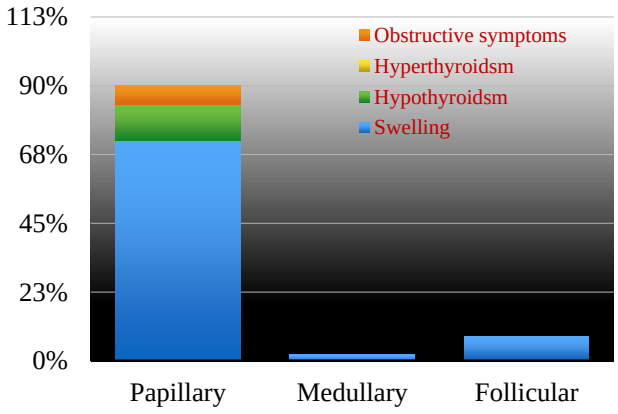

Figure 1: Association of symptoms with thyroid malignancy.

Swelling in front of the neck is the predominant symptom in thyroid malignancy with 82% predominance. But it is statistically not significant with p value 0.006.

Figure 2 represents that 76.4% (210 patients) of the goitre patients were presented with duration of more than 6 months. 23.6% (65 patients) had symptoms of less than 6 months duration.

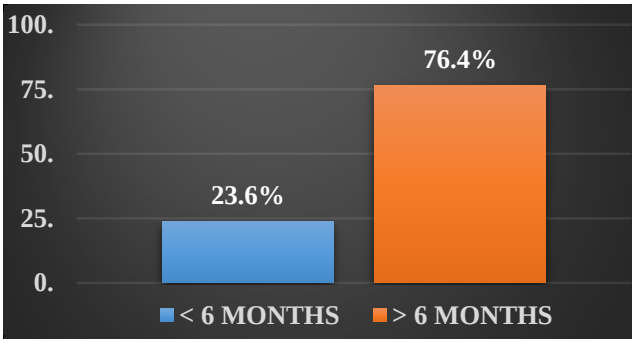

Figure 2: Distribution of duration of symptoms among participants in this study.

52% of patients diagnosed with thyroid malignancy, presented with the described symptoms of more than 6 months duration. The association of duration with malignancy is statistically significant with p value 0.00. The odds ratio was 0.241 with confidence interval of 95% between 0.126 and 0.462.

In this study group majority of the patients presented as euthyroid status. Among 225 benign lesions 188 patients were euthyroid which is about 81%.

Table 2: Association of symptoms with thyroid malignancy.

Symptoms	Papillary	Follicular	Medullary	Total
	N (%)	N (%)	N (%)	
Swelling	36 (72)	4 (8)	1 (2)	41 (82)
Hypothyroidism	6 (12)	0 (0)	0 (0)	6 (12)
Hyperthyroidism	0 (0)	0 (0)	0 (0)	0 (0)
Obstructive symptoms	3 (6)	0 (0)	0 (0)	3 (6)
Total	45	4	1	50 (100)

Table 3: Association of duration of symptoms with thyroid malignancy.

Duration (in months)	Papillary	Follicular	Medullary	Total
	N (%)	N (%)	N (%)	N (%)
<6	23 (46)	1 (2)	0	24 (48)
>6	22 (44)	3 (6)	1 (2)	26 (52)
Total	45	4	1	50 (100)

Table 4: Distribution of functional status of thyroid.

TFT	Benign	Malignant	Total
	N (%)	N (%)	N (%)
Euthyroid	188 (81.0)	44 (19.0)	232 (100)
Hypothyroid	20 (76.9)	6 (23.1)	26 (100)
Hyperthyroid	17 (100)	0 (0)	17 (100)
Total	225	50	275

Table 5: Association of TFT with thyroid malignancy.

TFT	Malignancy (%)
Euthyroid	44 (88)
Hypothyroid	6 (12)
Hyperthyroid	0 (0)
Total	50 (100)

Table 5 shows that among 50 malignant cases, 44 patients were in euthyroid status which represented 88%. None of the hyperthyroid patients in this study group presented with malignancy. But it is statistically not significant. The commonest benign cytological picture in FNAC is colloid goitre with incidence of 42.9%. FNAC cannot differentiate follicular neoplasm from carcinoma.

The association of FNAC and malignancy is statistically significant with p value 0.00 which is calculated by Chi-square test (Table 6).

The specificity of targeted FNAC under ultrasound guidance is 90% in diagnosing malignancy in goiter in this study group. But excluding follicular carcinoma the accuracy of USG guided FNAC in diagnosing malignancy in goiter is 98%.

Table 6: Distribution of thyroid pathology by FNAC.

FNAC	No. of cases	%
Papillary CA	44	16
Follicular neoplasm	38	13.8
Medullary CA	1	0.4
Anaplastic CA	0	0
Colloid	118	42.9
Thyroiditis	71	25.8
Hurthle cell neoplasm	3	1.1
Total	275	100

Table 7: Distribution of thyroid pathology by biopsy.

Biopsy	No. of cases	%
Papillary CA	45	16.4
Follicular CA	4	1.5
Medullary CA	1	0.4
Anaplastic CA	0	0
Colloid	23	8.4
SNG	3	1.1
MNG	90	32.7
Follicular adenoma	34	12.4
Thyroiditis	72	26.2
Hurthle cell adenoma	3	1.1

Table 8: Comparison between FNAC and biopsy in this study group.

Malignancy	FNAC positive	Biopsy positive
PAP CA	44	45
Follicular CA	0	4
Medullary CA	1	1
Total	45	50

DISCUSSION

The predominant symptom of thyroid malignancy in the present study was swelling in front of the neck (82%) and the most common pathological type, papillary carcinoma also presented predominantly as swelling in front of the neck in 72% cases. The above results are similar to the study conducted by Holzer et al in 1996 in Germany and published in 2000.[9]

A study conducted by Rahman et al in 2014 in Bangladesh concluded that longer the duration, more the chance of malignancy.[10] In this study group the incidence of malignancy is more in the patients with duration more than 6 months with incidence of 52% which was statistically significant with p value 0.00 by Chi-square test.

In this study group no cases of hyperthyroidism had malignancy. 88% of cases with malignancy in this study group were in euthyroid state followed by hypothyroidism. But various literatures suggest incidence of malignancy in hyperthyroidism as 0.8-9%.[11]

In a study conducted by Dorairajan et al in 1994 at a teaching hospital in Chennai concluded that the diagnosis of thyroid cancer was confirmed by fine needle aspiration cytology in about 88% of the cases.[12] In our study about 90% of the cases were diagnosed by FNAC. Both FNAC and biopsy were done in 275 cases during the study of which 38 cases were reported as follicular neoplasm on FNAC. Total thyroidectomy was done for such patients and biopsy proved that only 4 cases had follicular carcinoma (10%).

CONCLUSION

Commonest symptom of thyroid malignancy was a painless swelling in the front of the neck. Most common thyroid pathology presenting as thyroid swelling was multinodular goiter. Nearly half of the patients with thyroid malignancy had duration of symptoms more than 6 months. FNAC has high sensitivity in diagnosing malignancy. The accuracy of FNAC in diagnosing thyroid cancer was similar to that reported in literature. FNAC under ultrasound guidance is an inexpensive, accurate and practical investigation for evaluation of thyroid carcinomas. Under ultrasound guidance, the possibility of getting a representative sample from suspicious foci of thyroid malignancy is higher ensuring more sensitivity and specificity.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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