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Original Research Article

Prevalence of thyroid malignancy in goitre: a cross sectional study

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ABSTRACT

Background: Goitre includes a heterogenous group of tumours that show considerate variability in histological appearance and biological behavior.[1] As thyroid malignancy presents as any other benign condition of thyroid in its early stages, success in treatment of this condition lies largely upon early diagnosis and appropriate management. Hence this study was done to evaluate the prevalence of thyroid malignancy in goiter, their modes of presentation and the incidence of various pathological types.
Methods: A hospital-based cross-sectional study involving 275 patients was conducted. Data about the patient's age, sex, clinical presentations and duration of symptoms were collected using a proforma. The functional status of the patient was assessed with thyroid function tests. Anatomy of the gland was assessed by ultrasonogram. Ultrasound guided FNAC was done to assess the cytology. Histopathological evaluation of the thyroidectomy specimen was done.
Results: The prevalence of thyroid malignancy was found to be 18.1% with a female preponderance of 94%. The age of presentation was noted to be predominantly between 3rd and 5th decade with a mean age of 42.95 years. Female-male ratio was 15:1. Swelling in front of the neck was the predominant clinical presentation in 82% of patients. Among the thyroid malignancies papillary carcinoma was found to be the commonest malignancy with incidence of 90%.
Conclusions: Thyroid malignancy is the commonest endocrine malignancy. Our study revealed a significant prevalence of thyroid malignancy among patients presenting with goiter between 3rd and 5th decade with a female preponderance.

Keywords: Thyroid malignancy, Goitre, Endocrine malignancy

INTRODUCTION

Thyroid cancer is overwhelmingly the most common type of endocrine malignancy accounting for a majority of deaths due to endocrine cancers. Goitre is the diffuse enlargement of thyroid gland. It is divided into two types. They are diffuse goitres and nodular goitres. Nodular goitre is again divided into solitary nodular goitre and multinodular goiter.[1]

Thyroid malignancies are a heterogeneous group of tumours which show considerable variability in biological behaviour, histological appearances and response to therapy. Thyroid cancer represents 1% of all malignancies. They constitute the most common variety of endocrine tumours and are noted to occur with an incidence of 25 to 40 cases per million population per year. Incidence ranges from 10% to 13% in different parts of world.[2,3] The incidence of thyroid Carcinoma is increasing all over the world.[4] The majority of the

patients with carcinoma of the thyroid have differentiated cancer varying in histology from a pure papillary carcinoma to a follicular carcinoma and in some instances mixed papillary and follicular variants. Differentiated carcinoma of the thyroid gland is most prevalent in young adults with a female to male ratio of 2:1.

Thyroid cancer affects all age groups and is found to be more aggressive in the elderly. Controversy still exists over the treatment of these types of cancers because of the long term survival of patients with differentiated thyroid cancers irrespective of the type or extent of treatment. A high index of suspicion is required for diagnosis of these cancers. Undifferentiated thyroid cancers continue to have a dismal prognosis. Anaplastic thyroid carcinoma remains one of the most difficult human malignancies to treat and is highly lethal. Medullary thyroid cancer is one of the best characterized solid malignancies. The genetic abnormalities in these patients can be diagnosed accurately and can be used to detect and treat patients with familial gene mutations at an earlier stage. The knowledge base about thyroid malignancies is continuously evolving and may lead to better treatment options.

Cancer of the thyroid gland represents a spectrum of different histological entities with diverse clinical behaviour. Generally there is a very low progression from differentiated carcinoma to anaplastic carcinoma. However, this transition takes decades to takes place in most instances. The clinical evaluation of thyroid nodule is a common problem confronting the clinicians. The vast majority of such nodules are benign, but a thyroid swelling harbouring malignancy demands prompt and accurate diagnosis. The natural history of thyroid carcinomas allows the surgeon to perform a more prolonged and thoughtful preoperative workup and evaluation. Appropriate management is essential to achieve the optimal therapeutic success. The fine needle aspiration cytology is now the cornerstone investigation for many of these patients and evaluation and subsequent treatment usually involve assessment by a multidisciplinary team fully conversant in all aspects of thyroid cancer therapy.

Aim of the study

The aim of the study was to evaluate the prevalence of thyroid malignancy in goiter, their modes of presentation and the incidence of various pathological types.

METHODS

A hospital-based cross-sectional study involving 275 patients was conducted in the Department of General surgery, Dr. Somervell Memorial CSI Medical College Karakonam, Trivandrum during January 2015 to December 2018. Data about the patient's age, sex, clinical presentations and duration of symptoms were collected using a pre-tested and pre-designed pro-forma after informed consent from the patient. The functional status of the patient was assessed by laboratory investigations like thyroid function test (serum FT3, FT4 and thyroid stimulating hormone [TSH]).Anatomy of the gland was assessed using ultra sonogram. Ultrasound guided FNAC was done to assess the cytology. Post thyroidectomy, histopathological evaluation of the specimen was done.

Study design: cross sectional study design.

Inclusion criteria

All patients were presenting with Goitre to the Department of General Surgery in Dr.Somervell Memorial CSI Medical College Karakonam, Trivandrum, India.

Exclusion criteria

Patients who refused to take part in this study, patients who are seriously ill, patients with recurrence following total or hemi thyroidectomy.

Sample size

Various studies reported that the prevalence of malignancy in goitre varies from 10% to 13%.[2,3] We expect the prevalence of malignancy in our population to be 13% with effect size 4%.We calculated the sample size with the formula where p is expected prevalence of the factor under study (13%). Q is (100-p). The effect size is 4%. Sample size was estimated to be 275.

Variables used in the study

Outcome variables: Thyroid malignancy, diffuse goitre, solitary nodular goitre, multinodular goitre, thyroiditis,

Exposure variables: Age, clinical data, gender, duration of symptoms, treatment history, thyroid function test.

Semi structured questionnaire was used to collect data using interview technique. Ultrasound neck was used to identify signs of malignancy. Ultrasound guided fine needle aspiration cytology was done for primary evaluation before surgery. Total thyroidectomy was done in all cases. Post-surgery, histopathological evaluation of the specimen was done to look for the presence of malignancy and its pathological type.

Ethical permission was obtained from institutional review board (IRB). Data was analysed using the IBM SPSS software. All qualitative variables are expressed as proportions and quantitative variables as mean and standard deviation. Chi square test was done for statistical test of significance, and odds ratio for strength of association.

RESULTS

This study group consisted of 275 patients. A proforma was used to record the pertinent information about each patient. All the details of the pro-forma was summarized into a master chart. Then statistical analysis of the data was done.

Table 1: Prevalence of malignancy.

Biopsy	Benign	Malignancy
Goitre	225	50

Table 2: Frequency of pathological subtypes.

Malignancy	Numbers	%
Papillary	45	90
Follicular	4	8
Medullary	1	2
Anaplastic	0	0
Lymphoma	0	0
Total	50	100

Among 275 patients with goiter, 50 patients were found to have malignany which is about 18.1%. In this study group papillary carcinoma was found to be the commonest malignancy with a prevalence of 90% followed by follicular carcinoma with a prevalence of 8%.

Table 3: Gender distribution of participants in our study (n=275).

Gender	Number	%
Male	15	5.5
Female	260	94.5

There is a female preponderance seen in Goitre in this study group with an incidence of 94.5%. The ratio of male:female in this study group was 1:15.

Table 4: Association of gender with thyroid malignancy (n=50).

Sex	Percentage (%)
Males	3 (6)
Females	44 (94)

Among the participants there is a female preponderance seen in thyroid cancers with 94%in this study group. But it is statistically not significant with p value of 0.851. The Male female ratio of thyroid malignancy in this study group is 1:15.

The mean age is 42.95 with standard deviation of 12.138. In this study group the maximum incidence of malignancy is between 3rd and 5th decade with papillary carcinoma constituting 66%. But this association is statistically not statistically significant (p=0.72).

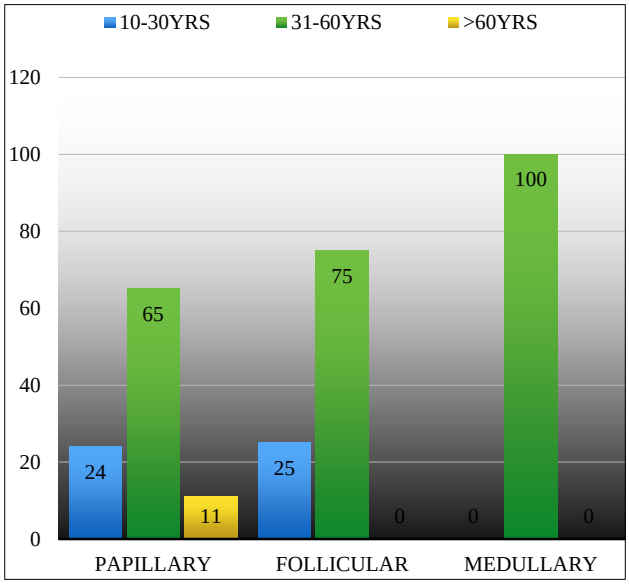

Figure 1: Frequency of thyroid malignancy in different age groups (n=50).

Table 5: Age wise distribution of malignancy among the participants (n=50).

Age	Malignant				Total (%)
	Papillary (%)	Follicular (%)	Medullary (%)	Anaplastic (%)	
10 to 30 years	11 (24)	1 (25)	0 (0)	0	12 (24)
31 to 60 years	29 (65)	3 (75)	1 (100)	0	33 (66)
>60 years	5 (11)	0 (0)	0 (0)	0	5 (10)
Total	45 (100)	4 (100)	1 (100)	0	50 (100)

Table 6: Comparison of malignancy in this study with other studies.

Malignancy	In this study (%)	Other studies (%)
Papillary carcinoma	90	80-85
Follicular carcinoma	8	5-10
Medullary carcinoma	2	<10
Anaplastic carcinoma	0	5
Lymphoma	0	<2

The prevalence of various thyroid malignancy in this study group which was done in southern India almost correlates with the prevalence of thyroid malignancy in other parts of the world.

DISCUSSION

This was a cross sectional study conducted among the patients presenting to Dr. Somervell Memorial CSI Medical College, Trivandrum, with goitre. The main aim of this study was to know the prevalence of malignancy in goitre in this set of population. All patients in the study underwent detailed clinical, biochemichal, and radiological evaluation followed by total thyroidectomy. The data was statistically analysed, compared with the current literature on thyroid cancers and conclusions were drawn. The prevalence of thyroid malignancy in goitre in Dr. Somervell Memorial CSI Medical College is about 18% (Table 1). This is highly significant comparing to world literature.[5] A study conducted by Benzarti et al in Tunis found 9.5% incidence of malignancy.[6] Various studies says that the prevalence of malignancy in goitre is about 10 to 13%.[7] So this study population should be subjected to further researches to find out the association factor which is the reason for the high prevalence of malignancy. The mean age group of thyroid malignancy in this study group is 42.95 years (Table 5). In this study population the thyroid malignancy was more prevalent between 3rd and 5th decade (Table 5). Similar results were obtained in a study conducted by Reddy et al.[8]

In the present study the patients belonging to the age group 3rd and 4th decade were commonly affected. This finding may be due to the increased awareness among the people regarding thyroid cancers thus seeking medical aid earlier in the course of the disease and also advancement of investigations leading to early diagnosis. In this study group, the female to male ratio of thyroid malignancy was found to be 15:1 (Table 4). This is comparable to study conducted by Ortega et al.[9] In which the female-male ratio is about 16.3:5.7.

CONCLUSION

The incidence of thyroid malignancy in the present study is a little higher than world literature. The occurrence of thyroid cancer was maximum between 3rd and 5th decade of life with the mean age of 42.95 years. There was a female preponderance of thyroid malignancy in this study group. The commonest symptom of thyroid malignancy was a painless swelling in the front of the neck. The most common clinical presentation with thyroid swelling was MNG. The commonest malignancy in this study group was papillary carcinoma. Since we are dealing with a patient group spread across different levels of socio economic background and varied access to healthcare facilities and acceptance of primary and adjuvant treatment for cancer with regular follow up, the ideal method in our context would be to adapt to Total Thyroidectomy, as the first step of treatment so that early diagnosis and treatment gives a better outcome for the society.

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

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