

Original Research Article

Clinical study of prevalence of malignancy in nodular thyroid swelling

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ABSTRACT

Background: Large proportion of thyroid cancers arose from a pre-existing adenoma or from multinodular goiters. Surgical practice of removing thyroid nodule or multiple nodules of thyroid gland has been challenged for surgeons to prevent cancer. Aim of this study is to find out the prevalence of malignancy in solitary thyroid nodule and multinodular goitre in relation to age and sex. The aim of the study was to determine the incidence of malignancy in patients who underwent thyroidectomies.

Methods: Study of 100 cases of nodular thyroid swelling has been done during the period from November 2017 to November 2019 on inpatients admitted to GEMS Hospital, Srikakulam, and Andhra Pradesh, India. Detail clinical examination, relevant investigations, surgical management and histopathological reports were collected and analyzed using software package for statistical analysis (SPSS 20).

Results: Out of 100 patients with thyroid swellings, thyroid malignancies constitute 4%. The occurrence of thyroid cancer was maximum in the 4th decade of life. Female patients outnumbered males with a ratio of 4:0. Relative frequency of malignancy in solitary thyroid nodule was 4.76% and in multi-nodular goitre was 3.03%. Most common histopathological type was papillary carcinoma thyroid (50%); followed by follicular carcinoma thyroid (25%) and medullary carcinoma (25%).

Conclusions: The prevalence of thyroid malignancy in the present study is at an earlier age group due to early diagnosis and treatment. The prevalence of thyroid cancer is higher in female when compared to those reported in the literature. The proportion of medullary cancer is more in present study.

Keywords: Nodular thyroid swelling, Papillary carcinoma thyroid, Follicular carcinoma, Medullary carcinoma

INTRODUCTION

The thyroid gland is an endocrine gland which regulates the basal metabolic rate, stimulates somatic and psychic growth and plays important role in calcium metabolism.¹ Thyroid nodules are the most commonly seen in clinical practice. The presentation can be as solitary thyroid nodule within a normal thyroid gland or dominant nodule in multinodular goiter. Appearance of goiter is early in endemic goiter and late in sporadic case.² The prevalence of palpable thyroid nodule in South India is about 12.2%. However, the reported incidence of thyroid cancer in general population is low (1%). Thyroid cancers occur in

approximately 5% of all thyroid nodules independent of their size.³ The present clinical study was undertaken to find out the prevalence of malignancy in solitary thyroid nodule and multi-nodular goitre in relation to age and sex.

The aim of the study was to determine the incidence of malignancy in patients who underwent thyroidectomies.

METHODS

This study was hospital-based prospective observational study includes 100 patients with nodular thyroid swellings attended to the department of general surgery, GEMS,

Srikakulam, during the period from November 2017 to November 2019.

The study was approved by ethics committee of the hospital and informed written consent was obtained from all patients. Detail clinical presentation, examination findings, investigations and line of management were documented. Routine blood investigations, thyroid function tests, X-ray chest and neck, ultrasound neck, fine needle aspiration and cytological diagnosis were done in all patients. Indirect laryngoscopy was done to determine the status of the vocal cords movements.

The patients confirmed by FNAC were subjected to surgery and histopathology reports were documented. The patients were followed up after one-month surgery and then every 6 months until the completion of study. Patients underwent thorough clinical examination, investigative procedures like chest X-ray, thyroid profile, and serum calcium to detect post-operative complications and local recurrence or distant metastasis during follow up.

Inclusion criteria

All patients with nodular goiter were included.

Exclusion criteria

Patients who were pregnant and patients with major comorbidities were excluded.

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS 20) software. Descriptive statistics like means, frequencies and percentages are used. P value less than 0.05 is considered statistically significant.

RESULTS

In this study mean age of the patients of nodular goitre was 40.31 ± 12.33 years and the highest frequency (28%) was in 31-40 and 41-50 years. Out of 100 patients, male were 12 (12%) and female were 88 (88%).

Male: female ratio was (1:7.3). This female preponderance of thyroid swellings is reflected in all studies including the present. In our study all patients presented with swelling of the thyroid (100%) without lymph nodal mass, hoarseness of voice, dysphagia, dyspnea and symptoms of hyperthyroidism.

Histopathology of thyroid malignancies

In this series, it was found that papillary carcinoma is most common histological type of thyroid carcinoma with 2% cases and follicular and medullary carcinoma in 1% cases, follicular adenoma in 11% cases, Hurthle cell adenoma in 1% cases.

Frequency of malignancy

In this series, relative frequency of malignancy in solitary thyroid nodule was 4.76% and in multi-nodular goitre was 3.03%.

Distribution of thyroid malignancy

In the present study of all the malignancies detected 50% are papillary carcinoma and 25% follicular carcinoma and 25% are medullary carcinoma.

Prevalence of malignancy in relation to sex

No cases of carcinoma thyroid were reported in male patients my study. 4 cases of carcinoma thyroid were found in females on histopathology out of which 2 are papillary, one follicular and one medullary. No cases of anaplastic carcinoma are found.

Prevalence of malignancy in relation to age

In the present study all cases are between age group of 30-50 years. Three between age group of 40-50 years. One in age group 30-40 years.

Surgery for the primary disease

In the present study total thyroidectomy was done in 26 cases, subtotal thyroidectomy 2 cases and hemithyroidectomy 72 cases, 2 cases of malignancy one papillary and one follicular underwent hemithyroidectomy and were found malignant on biopsy.

Duration of thyroid swelling

Of the 4 patients who were diagnosed with thyroid malignancy 25% patients has duration less than 6 months, 50% 1 year duration, 25% 2 years duration. Seventy-five of the patients presented with swelling of less than one-year duration.

Table 1: Age distribution of patients with solitary and multinodular goiter

Age (years)	Solitary thyroid nodule (STN)	Multinodular goiter (MNG)	Total percentage (%)
11-20	2	1	3
21-30	12	9	21
31-40	21	7	28
41-50	16	12	28
51-60	13	5	18

Continued.

Age (years)	Solitary thyroid nodule (STN)	Multinodular goiter (MNG)	Total percentage (%)
61-70	2	0	2
Total	65	35	100

Table 2: Histopathological diagnosis in STN and MNG.

Diagnosis	Solitary thyroid nodule (STN)	Multinodular goiter (MNG)
Follicular adenoma	10	1
Papillary carcinoma	2	0
Medullar carcinoma	1	0
Anaplastic carcinoma	0	1
Autoimmune thyroiditis	8	0
Hurthall cell adenoma	1	0

Table 3: Frequency of malignancy in STN and MNG.

Types	Malignant	Non-malignant	Total	Relative frequency
STN	3	63	65	4.76
MNG	1	33	35	3.03

Table 4: Distribution of thyroid malignancy in STN and MNG.

Variables	STN	MNG	Percentage (%)
Papillary carcinoma	2	0	50
Follicular carcinoma	1	0	25
Medullary carcinoma	0	1	25

Table 5: Prevalence of malignancy in relation to age.

Age group (years)	No. of malignancies
20-29	0
30-39	1
40-49	3
50-59	0

Table 6: Surgery for the primary disease.

Surgery	Number of cases	Percentage (%)
Total thyroidectomy	26	26
Subtotal thyroidectomy	2	2
Isthmectomy	0	0
Hemithyroidectomy	72	72

Table 7: Duration of thyroid swelling in thyroid malignancies.

Duration	Number of cases	Percentage (%)
<3 months	0	0
3-6 months	1	25
6 months to 1year	2	50
1-2 years	1	25

DISCUSSION

Dave RI et al and Bansali et al have studied the age incidence of thyroid carcinoma and have reported that the commonest age group affected is the 5th and the 6th decade respectively.^{4,5} In the present study the 4th decade is commonly affected. This may be due to the increased awareness among the people in recent days. In this study,

mean age of the patients of nodular goitre was 40.31 years and the highest frequency (42%) was in 31-40 years. This correlated with study of Rahman. Nath, Sattar et al.^{6,7} The youngest patient in this study was a girl of 19 years with a colloid cyst and the oldest patients was a lady of 62 years with colloid cyst. The youngest patient and oldest patients of this study both had been suffering from benign thyroid disease, but according to literature the extreme of ages

show less incidence of thyroid disease but have a more chance to be malignant. Reviews in literature reports that thyroid disorders in females are diagnosed three times more often than for men.⁸⁻¹⁰ In this study, out of 100 patients, male were 12 (12%) and female were 88 (88%). Male female ratio was (1:7.31). This ratio was shown 1:5 by Rahman et al, 1: 4 Zuberi et al.^{6,11} This female preponderance is reflected in all studies including the present. The predominant symptom in the present study was thyroid mass which was also the predominant symptom in the study conducted by Holzer et al.^{12,13}

In the present study the papillary carcinoma was the most common type of thyroid malignancy seen in the hospital. Among the malignancies papillary carcinoma was 50%, follicular carcinoma was 25% and medullary carcinoma each was 25%. In the study conducted by Simon et al, the papillary thyroid carcinoma formed about 66.4% of the study.¹² The proportions of different types of thyroid malignancies in the present study are similar to those in the study conducted by Simon et al.¹² It was different to study of Zygmunt and et al.¹⁴ The reason for the increased incidence of medullary carcinoma could be the less sample size. In this series, after operation, histopathological report analysis was done and found that follicular adenoma was 11%, papillary carcinoma was 2%, follicular carcinoma was 1% and auto immune thyroiditis was 8%. In the literature, the incidence rates of cancer in thyroid nodules range between 4% and 42%, according to cancer frequency, incidental nature, a wide population base, and the presence of an endemic region.¹⁵⁻¹⁹ In this study, relative frequency of malignancy in solitary thyroid nodule was 4.76% and in multi-nodular goitre was 3.03% which doesn't correlate with study of Asraf et al, Rahman et al and Satter et al.^{7,20,21} In study of Rahman in solitary thyroid nodule, malignancy was 21.44% and in multi-nodular goitre was 8.1%. It was observed that relative frequency of malignancy was higher than that of others studies. It might be happened due to small sample size, sampling bias.

In this study frequency of malignancy differs significantly with age and sex, patient in their forties is more prone to malignancy. In this study observed that follicular carcinoma occurred in the age group 31-40 years but follicular carcinoma usually occurs in the age group 50-59 years. So, it is a matter of thinking that follicular carcinoma is occurring in early age group. But it may be a good sign that our patients are becoming aware regarding thyroid nodule and are attending in hospital for early surgical treatment.

CONCLUSION

The prevalence of thyroid malignancy in the present study is at an earlier age group due to early diagnosis and treatment. The prevalence of thyroid cancer is higher in female when compared to those reported in the literature. The most common mode of clinical presentation was thyroid swelling which was higher than those in comparative study. The proportion of different

histopathological types of thyroid cancer were similar to those reported in literature except cases of medullary cancer are more in present study than in the literature. A significant proportion of solitary thyroid nodule and multi-nodular goitre may be malignant. So, it should get appropriate medical attention.

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