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Original Research Article

A study to determine the incidence of carcinoma of the thyroid gland in patients treated for multinodular goiter

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ABSTRACT

Background: In the population today, the presence of multi nodular goiter (MNG) is found in quite a few people and this may be due to various reasons. The patients should be thoroughly evaluated and a detailed history must be collected. Surgical treatment is offered to patients for various reasons. The objective of this research article is, to determine the incidence and the type of carcinoma of the thyroid gland in patients treated for multinodular goiter.
Methods: A total of 105 patients who had multinodular goiter were studied. The study was carried out at SRM Medical College Hospital and Research Center, Kattankulathur, Tamil Nadu, India, from March 2016 to February 2019, for a period of three years. A detailed history was obtained and a thorough clinical evaluation was done. Investigations such as, complete blood count, thyroid function tests, ultrasound of the neck, and fine needle aspiration cytology were done. The patients then underwent total thyroidectomy and the operated specimens were subjected to histopathological examination (HPE). Out of the total of 105 patients that were studied, 21 patients were found to have carcinoma of the thyroid gland. The statistics were analysed using SPSS package 16.0.
Results: From the results it was seen that papillary carcinoma of the thyroid gland was most commonly found in the operated specimens. The findings were compared with other studies.
Conclusions: In patients with multinodulargoiter, a thorough evaluation and a detailed histopathological examination of the operated specimens must be done.

Keywords: Multinodular goiter, Histopathological examination, Fine needle aspiration cytology, Thyroid function tests, Total thyroidectomy

INTRODUCTION

In the general population, patients come to the surgical department with complaints of swelling in the front of the neck for a particular duration of time. A thorough history must be obtained and a thorough evaluation must be done. The other symptoms that patients may complain of may be difficulty in swallowing, cough and occasionally respiratory distress. Clinical examination and investigations are very important to determine if the patient is hyperthyroid or hypothyroid. Once a diagnosis of multinodular goiter (MNG) is made and if the patient is euthyroid, then the treatment options are provided for the patient. Surgical treatment is offered to patients for various causes such as cosmetic, pressure symptoms, and when the FNAC findings are suspicious. It is very important to rule out the possibility of malignancy in a patient presenting with multinodular goiter. Sometimes, the FNAC results may be inconclusive or suspicious and therefore it is very important to subject the operated specimen to a thorough histopathological examination (HPE). Studies have shown that, if surgical specimens of

multinodular goiters are examined carefully, 4-17% are found to harbor a carcinoma.[1] High resolution ultrasound is a very useful imaging modality for objectively detecting size, number and cellular nature of the nodules.[2] Nuclear imaging is a useful modality for the functional characterization of a thyroid nodule.[3] The presence of lymphnodes must also be carefully looked for, in order to rule out the possibility of carcinoma of the thyroid gland.[4] Studies have demonstrated that the incidence of carcinoma in patients with nodular goiter is higher than the incidence of the general population. Fine-needle aspirate cytology is a fast, accurate and inexpensive test to obtain cellular samples, and a series of reviews have reaffirmed its importance in the assessment of thyroid nodules.[5] Bloch had done a comparison study between FNAC and histopathology and then found that the accuracy and FNAC was 91.6%.[6]

Objective

The objective of this study was to determine the incidence and the type of carcinoma of the thyroid gland in patients treated for multinodular goiter in a tertiary hospital.

METHODS

A total of 105 patients who had multinodular goiter (MNG) were studied. This was a prospective study and was carried out at SRM Medical College Hospital and Research Center, Kattankulathur, Tamil Nadu, India, from March 2016 to February 2019, for a period of three years. A detailed history was collected and a thorough clinical examination was done. Investigations such as, complete blood count (CBC), thyroid function tests (TFT), chest X-rays, X-rays of the neck, ultrasound of the neck, and fine needle aspiration cytology (FNAC) of the thyroid swelling were done. The patients who were in euthyroid state had then undergone total thyroidectomy and the specimens were subjected to histopathological examination (HPE). Out of the total 105 patients that were studied, 21 patients were found to have carcinoma of the thyroid gland. The statistics were collected and tabulated. The statistics were analysed using SPSS package 16.0.

Inclusion criteria

Patients who were diagnosed to have multinodular goiter during their first visit to the surgical outpatient department of the hospital and patients who were between the age group of 20 years to 70 years of age were included.

Exclusion criteria

Patients who had solitary nodule of the thyroid gland and patients who were below 20 years and above 70 years of age were excluded.

RESULTS

The results obtained from our study were tabulated.

From the Table 1, it was seen that fine needle aspiration cytology (FNAC), is a very useful tool to differentiate patients with benign and malignant thyroid swellings. Non-neoplastic swellings were 80% and neoplastic swellings were 20%.

Table 1: Fine needle aspiration cytology (FNAC) diagnosis for all patients with MNG (n=105).

FNAC diagnosis	No. of patients	%
Non-neoplastic	84	80
Neoplastic	21	20

Table 2: Ultrasound findings of the thyroid swellings (n=105).

Findings	No. of patients	%
Benign	84	80
Highly suggestive of malignancy	21	20

Table 3: Thyroid function test (TFT) reports of the patients with MNG (n=105).

TFT report	No. of patients	%
Euthyroid	72	68.57
Hypothyroid	25	23.80
Hyperthyroid	8	7.61

Table 4: Sex wise incidence of patients with carcinoma of the thyroid gland (n=21).

Gender	No. of patients	%
Male	3	14.28
Female	18	85.71

Table 5: Disease wise incidence of patients with carcinoma of the thyroid gland (n=21).

Disease of thyroid gland	No. of patients	%
Papillary carcinoma	15	71.42
Follicular carcinoma	5	23.80
Medullary carcinoma	1	4.76

Ultrasound scan of the thyroid swellings showed about 20% of the patients to have thyroid swellings with features suggestive of malignancy (Table 2).

From the Table 3, it was found that out of total 105 patients that were studied, 68.57% were euthyroid, 23.80% were hypothyroid and 7.61% were hyperthyroid. The patients with hyperthyroidism and hypothyroidism were brought to euthyroid state before total thyroidectomy was planned.

Table 6: Age wise incidence of patients with carcinoma of the thyroid gland (n=21).

Age (in years)	No. of patients	%
20-30	4	19.04
31-40	8	38.09
41-50	7	33.33
51-60	1	4.76
61-70	1	4.76

Out of total 105 patients studied, 21 patients were diagnosed to have carcinoma of the thyroid gland. Out of these 21 patients with carcinoma of the thyroid gland, 14.28% were male and 85.71% were female (Table 4).

From the Table 5, it was found that papillary carcinoma (71.42%) was the most common form of carcinoma of the thyroid gland.

From the Table 6, it was found that patients around the age group of 31 years to 40 years of age (38.09%), were most commonly affected with carcinoma of the thyroid gland.

DISCUSSION

Thyroid nodules are commonly seen in adults and in particular the female gender. In patients with multinodular goiter, it is extremely important to rule out the presence of any underlying thyroid malignancy as demonstrated by Hanumanthappa et al.[7] Davies et al in their study showed an increasing incidence of small thyroid cancers.[8] Hence, careful examination is very important. Papillary carcinoma is a form of well-differentiated thyroid cancer. Despite its well-differentiated characteristics, papillary carcinoma may be overtly or minimally invasive. Papillary tumors have a propensity to invade lymphatics but are less likely to invade blood vessels. The life expectancy of patients with this type of cancer is related to their age. The prognosis may be better for younger patients than for patients who are older than 45 years. Surgery is the definitive management of papillary thyroid cancer. Approximately 4-6 weeks after surgical thyroid removal, patients may have radioiodine therapy to detect and destroy any metastasis and residual tissue in the thyroid.

Follicular thyroid carcinoma originates in follicular cells and is the second most common cancer of the thyroid, after papillary carcinoma. Follicular and papillary thyroid cancers are considered to be differentiated thyroid cancers; together they make up approximately 95% of thyroid cancer cases. Patients with follicular thyroid carcinoma are more likely to develop lung and bone metastases than are patients with papillary thyroid cancer. The bone metastases in follicular thyroid carcinoma are osteolytic. Older patients have an increased risk of developing bone and lung metastases.

Medullary carcinoma of the thyroid is a form of thyroid carcinoma that originates in the parafollicular C cells of the thyroid gland. These C cells produce calcitonin. The inherited form of medullary carcinoma of thyroid may occur in association with multiple endocrine neoplasia (MEN) type 2A and 2B syndromes.

Anaplastic carcinoma of the thyroid is the most aggressive form of thyroid gland malignancy. Local invasion into adjacent structures such as the trachea and the oesophagus is found to occur.

The results obtained from our study were compared with the results from other studies.

Table 7: Comparison of FNAC findings for our patients with other studies (n=105).

FNAC diagnosis of malignancy of thyroid gland	%
Schlessinger et al[9]	8
Kapur et al[10]	11
Bhansali et al[11]	9
Abu Eshy et al[12]	15.2
Our study	20

Table 8: Comparison of the incidence of carcinoma of the thyroid gland.

Our study	Mofti et al[13]	Stoffer et al[14]	Benzarti etal[15]	Cerci et al[16]	Prades et al[17]
20%	29%	13%	9.5%	10%	12.2%

Table 9: Comparison of the types of carcinoma of the thyroid gland with another study.

Type of thyroid carcinoma	Our study (%)	Shah et al[18] (%)
Papillary carcinoma	71.42	69
Follicular carcinoma	23.80	11.6
Medullary carcinoma	4.76	9.7

From Table 7, it was found that malignancy of the thyroid gland was picked up on FNAC in 20% of our patients and this was compared to other studies. Table 8 shows that the incidence of carcinoma of the thyroid gland was 20% in our study and this was compared to other studies.

Table 9 shows that among our patients who were found to have carcinoma of the thyroid, papillary carcinoma (71.42%) was found to be the most common type. This was compared to another study.

CONCLUSION

From our study, it is seen that papillary carcinoma is the most common type of carcinoma of the thyroid gland.

Women were affected more with a percentage of 85.71%. The people between the age group of 31-40 years were more commonly affected with a percentage of 38.09%. This study shows the importance of investigating patients with swelling of the thyroid gland. Radiological investigations and histopathology play a very important role in diagnosing carcinoma of the thyroid gland. A thorough history and clinical examination is extremely important as well.

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