THYROID CANCER: A RETROSPECTIVE ANALYSIS

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ABSTRACT

BACKGROUND

The incidence of Thyroid cancer has been steadily increasing all over the world. The large majority of these malignancies are represented by differentiated thyroid carcinomas, such as papillary thyroid carcinoma and follicular thyroid carcinoma. With routine physical check-ups, widespread application of high-resolution ultrasonography and fine-needle aspiration biopsy contributed to an increase in the rate of preoperative diagnosis of thyroid carcinoma for the last few decades. Considering the rising incidence of thyroid cancer worldwide, the aim of our study was to find out, which type of thyroid cancer is more common in our population undergoing thyroid surgery.

MATERIALS AND METHODS

A total of 25 adult patients of either gender with solitary nodules and/or multi-nodular goitre diagnosed histologically as thyroid carcinoma were analysed in our study. A retrospective analysis was done in all patients undergoing malignant thyroid surgery at the Jawaharlal Nehru Institute of Medical Sciences, Imphal. All clinical and pathological data were recorded into a computerized database.

RESULTS

In our study, 21 patients were female and 4 patients were male with age ranging from 18 to 62 years (Mean age – 45 years). The final pathological report shows 24 cases as papillary carcinoma and 1 case as follicular carcinoma.

CONCLUSION

The most common thyroid cancer occurring in our population is papillary thyroid carcinoma with more female predominance.

KEYWORDS

Thyroid Cancer, Incidence, Total Thyroidectomy, Papillary.

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INTRODUCTION

The incidence of Thyroid cancer have been steadily increasing all over the world.¹⁻⁴ Thyroid cancers are very common and account for about 1% of all human cancers.⁵ There are three main types of thyroid carcinoma: Well-differentiated thyroid carcinoma, poorly differentiated thyroid carcinoma and undifferentiated thyroid carcinoma. The large majority of these malignancies are represented by differentiated thyroid carcinomas, such as papillary thyroid carcinoma and follicular thyroid carcinoma.^{6,7} Papillary thyroid carcinoma is the most common form of thyroid cancer accounting for 70–90% of well-differentiated thyroid malignancies. The prognosis of differentiated thyroid carcinoma is excellent with 10-year overall survival rates exceeding 90%.⁸

Traditionally, prognosis and survival of thyroid cancer patients depend on specific prognostic factors which include age of patients at diagnosis, size of the lesion, extrathyroidal extension of tumour and presence of distant metastases.⁹

Most thyroid cancers present as thyroid nodules that are either asymptomatic or associated with local cervical symptoms or lymphadenopathy. Thyroid cancers rarely present with manifestations of metastatic disease, such as a pulmonary mass or bone pain.¹⁰ Clinical features (i.e. male gender, hard and firm neck lesion, previous neck radiation treatment), nodular lesion seen on ultrasound (i.e. solid nodule with irregular margin and microcalcifications) and scintigraphy (i.e. cold nodule) are considered as risk factors for thyroid malignancy.¹¹⁻¹⁶ With routine physical check-ups, widespread application of high-resolution ultrasonography and Fine-Needle Aspiration Biopsy (FNAB) contributed to an increase in the rate of preoperative diagnosis of thyroid carcinoma for the last few decades.^{1,2,17}

Considering the rising incidence of thyroid cancer worldwide, the aim of our study was to find out which type of thyroid cancer is more common in our population undergoing thyroid surgery.

METHOD

A total of 25 adult patients of either gender with solitary nodules and/or multi-nodular goitre diagnosed histologically as thyroid carcinoma were enrolled in our study.

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A retrospective review was conducted to all patients undergoing malignant thyroid surgery from 2010 to 2013 at the Jawaharlal Nehru Institute of Medical Sciences, Imphal, Manipur. All clinical and pathological data were recorded into a computerized database.

Collected data included gender, age, clinical features, investigations, surgical treatment, incidence of postoperative complications and final pathology. The approval of Medical Ethics was taken from Medical Ethics Committee of JNIMS and all patients signed informed consent.

Preoperative investigations like serum calcium, serum thyroid hormones, neck ultrasonography and fine needle aspiration biopsy report were included.

RESULT

In our study, 21 patients were female and 4 patients were male with age ranging from 18 to 62 years (mean age: 45 years). Neck mass was the chief complaint in all the 25 patients. Unilateral thyroid nodule was found in 20 cases, isthmus in 1 case and bilateral thyroid mass in 4 cases. Out of 20 cases with unilateral thyroid nodules, 12 cases presented with right side nodule and 8 cases with left side nodule. Two cases were found to have unilateral cervical lymph nodes enlargement. Thyroid function test shows normal range in 23 cases, hyperthyroidism in 1 case and hypothyroidism in 1 case. Both cases were treated with medication to bring it to euthyroid stage before surgery. Calcium level were within normal limit in all the 25 cases.

Ultrasound neck done in all the 25 cases shows solid nodule in 17 cases and microcalcifications in 13 cases. Fine Needle Aspiration Biopsy (FNAB) shows 19 cases of papillary carcinoma, 2 cases of follicular neoplasm, 3 cases of colloid goitre and 1 case of medullary carcinoma. Serum calcitonin was found within normal range in the case reported as medullary carcinoma by FNAB. The final pathological report shows 24 cases as papillary carcinoma and 1 case as follicular carcinoma. One case of follicular neoplasm, 3 cases of colloid goitre and 1 case of medullary carcinoma diagnosed by FNAB initially were later diagnosed as papillary carcinoma on histopathological examination.

Total thyroidectomy was done in 20 cases, total thyroidectomy with modified radical neck dissection in 2 cases and total thyroidectomy with central neck dissection in 3 cases. All the 3 cases who have undergone central neck dissection have no palpable lymph node clinically and ultrasound also did not show enlarged lymph node. Only intraoperatively the central lymph nodes were found to be enlarged, so central neck dissection was done. Postoperatively, 10 cases developed hypocalcaemia which were managed with calcium supplement. One case had persistent hypocalcaemia and required continuous calcium supplement.

Sex ratio (M/F)	4:21
Mean age (years)	55 (18-62 years)
Euthyroid	23
Hyperthyroidism	1
Hypothyroidism	1
Unilateral thyroid nodule	20
Bilateral thyroid mass	4
Isthmus thyroid nodule	1
Cervical lymphadenopathy	2
Table 1: Characteristics of 25 Patients with Thyroid Cancer	

Papillary carcinoma	19
Follicular neoplasm	2
Medullary carcinoma	1
Colloid Goitre	3
Table 2: Fine Needle Aspiration Biopsy	

Papillary carcinoma	24
Follicular carcinoma	1
Table 3: Postoperative Histopathological Diagnosis	

Total thyroidectomy	20
Total thyroidectomy + Modified radical neck dissection	2
Total thyroidectomy + Central neck dissection	3
Table 4: Types of Surgery	

Hypocalcaemia	10
Wound infection	1
Recurrent laryngeal nerve injury	Nil
Table 5: Complication of Surgery	

ABBREVIATIONS

FNAB - Fine Needle Aspiration Biopsy.

DISCUSSION

The incidence of thyroid cancer is rapidly increasing with one of the fastest rates of increase among common human cancers.¹⁸ This is primarily due to an increase in the incidence of early-stage papillary thyroid carcinoma from 3.4 to 12.5 per 100,000 people.¹⁹ Although, the main aim of our study was to know which type of thyroid cancer is more common in our population, we also included finding of clinical features, treatment and complications in our study. The mean age at presentation was 45 years and female predominance were consistent with findings from other studies.^{20,21} In our study, females were affected five times more than males (M:F=1:5.2). Similar with other studies, neck mass was the chief complaint in all the 25 patients with unilateral thyroid nodule in 20 cases (80%).²² Majority of our cases have normal thyroid function except for two cases; one had hyperthyroidism, another had hypothyroidism.

Previous studies have shown that thyroid cancer incidence increases with nodules associated with Grave's disease.^{23,24} Tamatea JA et al²⁴ in their study showed that the malignancy rate of palpable thyroid nodules in Grave's disease is approximately 16.9%. Ling Zhang et al²⁵ have shown that papillary thyroid carcinoma and Hashimoto's Thyroiditis have close relationship, especially in a patient with high thyroid stimulating hormone. But the association between hypothyroidism and cancer risk is controversial. In our study, both the cases with deranged thyroid function were neither associated with Grave's disease nor Hashimoto's thyroiditis.

A large number of studies have demonstrated the high overall accuracy of FNAB for the evaluation of thyroid nodule, especially in patients with single thyroid nodule.^{26,27} This is also observed in our study, where FNAB have diagnosed thyroid cancer in 23 cases (92%) even though the types of thyroid cancer were different in final histopathological report in two cases. However, FNAB has shown less accuracy in the evaluation of multinodular thyroid gland as 2 out of 4 cases with multiple nodular thyroid mass were initially diagnosed as colloid goitre. Kaliszewski et al²⁸ have shown in their study that the rate of prediction of thyroid cancer by FNAB in the

patients with solitary thyroid nodule was three times higher than that in the patients with multiple nodule.

This is important as in cases with negative FNAB result, the surgeon may perform a less radical procedure which will require another surgery for complete removal of the remaining thyroid gland. This happened in two of our cases where we have done subtotal thyroidectomy initially, as FNAB was reported as colloid goitre. Both these 2 patients underwent second surgery in the form of completion thyroidectomy. Some studies have shown that the accuracy of FNAB can be increased by correlating with Ultrasound finding and also doing FNAB under Ultrasound guidance.^{26,27} Brophy C et al¹⁷ in their study have shown that Ultrasound finding of microcalcification was associated with significant thyroid malignancy. In our study, finding of microcalcification on ultrasound were seen in 13 cases (52%).

Many studies have shown that total thyroidectomy is undoubtedly the optimal surgical treatment for patient with thyroid cancer.²⁹⁻³² In our study also total thyroidectomy were performed in 20 cases, total thyroidectomy with modified radical neck dissection in 2 cases and total thyroidectomy with central node dissection in 3 cases. There were only few surgical complications seen in our study with transient hypocalcaemia as the main complication occurring in 10 cases. Most of these cases recovered with calcium supplement. Only one patient developed parathyroid insufficiency and required continuous calcium supplement.

Our study showed higher rate of hypocalcaemia than the previous studies.³³ This may be the result of 5 out of 10 cases with hypocalcaemia, which have undergone neck dissection. Hauch A et al³⁴ have reported that surgical complication rates among less experienced and low-volume surgeons were higher than those in well experienced and high-volume surgeons. All the surgeries in our study were performed by experienced surgeons or were done under their supervision. Some authors have also suggested that the complication rate of total thyroidectomy is the same as that of partial thyroidectomy when surgery is performed at high-volume center.^{35,36} We also feel that total thyroidectomy is a safe and effective operative procedure for treatment of thyroid cancer. In our study, papillary thyroid carcinoma accounted for the vast majority of thyroid cancer seen in 24 cases, which is consistent with previous reports.^{21,37}

LIMITATIONS

One of the drawback of our study is the lack of a long-term follow-up to know about the survival rate and recurrent disease. Another limitation is the small sample size.

CONCLUSION

From our study, the most common thyroid cancer occurring in our population is papillary thyroid carcinoma with more female predominance. Even though our study was done in a small number of patients, to our knowledge this is one of the first study done to know the common types of thyroid cancer in our population.

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