

A prospective observational study on thyroid malignancy in a tertiary care hospital**Hareesh H D¹, Harish Iyyanna², Preethi S.P^{3*}**¹*Senior Resident, Department of General Surgery, Shivamogga Institute of Medical Sciences, Shivamogga, India*²*Assistant Professor, Department of General Surgery, Shivamogga Institute of Medical Sciences, Shivamogga, India*³*Associate Professor, Department of General Surgery, JSS Academy of Higher Education and Research, Mysuru, India***Received: 15-07-2021 / Revised: 05-08-2021 / Accepted: 15-10-2021****Abstract**

Introduction: Thyroid cancer constitutes a heterogeneous group of malignancies which exceeds half a million cases annually, ranking it as the fifth most common cancer worldwide. Head and neck cancers account for 6% of all cancers worldwide, with nearly 150,000 new cases in Europe alone each year. **Materials and Methods:** This prospective, observational, and clinical study on thyroid cancer was conducted in Department of General Surgery, JSS Academy of Higher Education and Research, Mysuru, India from July 2019 to December 2020. This study includes patients selected on a non-probable convenience sampling method with histopathologically confirmed TC cases. The informed consent was obtained from the participant before being enrolled. The IBM SPSS program for Windows was used to analyse the results. Sampling technique used is nonprobability sampling. Statistical tests used are univariate analysis, proportions and percentages. **Results:** During this study period, 700 patients are admitted to the hospital with various newly diagnosed oncological diseases, including Forty one thyroid cancer patients. Five patients are excluded from studies. Three of them had benign lesions in the postsurgical histopathological examination. Two patients lost during the follow-up period. A total of Thirty six patients were considered for final analysis; thus, thyroid cancers accounted for 2.39% of oncological disease. Females are commonly affected than men with a ratio of 5:1. The population standard deviation is σ 12.55 Table 1. **Conclusion:** The incidence of thyroid malignancies is more common among women (80.66%) than men. Papillary carcinoma (86.11%) is the common differentiated thyroid cancer. The prevalence of distant metastasis is 2.78% to the vertebral body. In our study, 41.66% of patients belongs to less than 30 years of age; this may be due to the trend of over diagnosis due to the introduction of ultrasonography guided Fine needle aspiration study.

Key Words: Thyroid cancer, Papillary carcinoma, oncological diseases.

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Introduction

Thyroid cancer constitutes a heterogeneous group of malignancies which exceeds half a million cases annually, ranking it as the fifth most common cancer worldwide. Head and neck cancers account for 6% of all cancers worldwide, with nearly 150,000 new cases in Europe alone each year[1].

Thyroid function test is the most widely diagnostic test available for diagnosis, which is easily accessible and acceptable for most of the population. Serum TSH level is more specific for thyroid disorders rather than measuring T3 or T4 which may be normal as in the case of subclinical thyroid disorder. Thyroid hormones secretion is maintained by the balance of TSH and TRH which is secreted by anterior pituitary and hypothalamus respectively. They are in perfect balance for normal functioning of thyroid hormones. However, thyroid disorders break the chain and disrupt this natural phenomenon[2].

The reported rate of thyroid carcinoma among all malignancies is approximately 1%.

In Saudi Arabia, thyroid cancer was the second most common malignancy after breast cancer, while it was reported as the third most common in the United Arab Emirates and fourth most common cancer in Filipino women[3].

Thyroid cancer is the most common of all endocrine malignancies, accounting for 87% of all endocrine gland tumors. Clinically diagnosed thyroid cancer accounts for 6.1% of all newly diagnosed cases of cancer in Saudi Arabia and are ranked fourth in males and second in females[4,5].

Hence this study is done to evaluate the modes of presentation, clinical behavior, and surgical management of the disease.

Materials and methods

This prospective, observational, and clinical study on thyroid cancer was conducted in Department of General Surgery, JSS Academy of Higher Education and Research, Mysuru, India from July 2019 to December 2020.

This study includes patients selected on a non-probable convenience sampling method with histopathologically confirmed TC cases. The informed consent was obtained from the participant before being enrolled. The IBM SPSS program for Windows was used to analyse the results. Sampling technique used is nonprobability sampling. Statistical tests used are univariate analysis, proportions and percentages.

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Inclusion criteria

Pathologically confirmed thyroid cancer patients (this also include FNAC is benign, but final histopathology is malignant) and patients who are willing to take part in studies were included in the study.

Exclusion criteria

Exclusion criteria excluded the patients less than 14 years of age, patients are referred to this hospital after the primary treatment, benign disease on histopathology, patients treated before and after this study period was not considered and patients were not willing to consent to the study.

Preoperative

Patients are subjected to clinical assessments and investigations. Investigations include thyroid hormone level, thyroglobulin, antithyroglobulin antibodies, serum calcium level, ultrasound of neck (morphology of thyroid gland, cervical lymphnodes), and USG guided fine needle aspiration cytology of the thyroid gland. Contrast-enhanced computer tomography was conducted in Patients with infiltration features to a surrounding structure, enlarged lymphnodes, or suspected tracheomalacia. Patients with hyperthyroidism received antithyroid drugs until the surgery day to prevent a perioperative thyroid crisis. The otolaryngologist assessed vocal cord motility preoperatively in all the patients.

Surgical procedure

The American thyroid association 2009 guidelines and the American joint commission on cancer 7th edition were used for staging the

disease. The FNAC, frozen section, and histopathologic diagnosis were used to decide the Surgery's extent, total thyroidectomy, or hemithyroidectomy. The neck dissection and central compartment clearance decision were taken based on the findings of clinical, radiology, intraoperative assessment, frozen section diagnosis, and poor prognostic features of thyroid cancer. Patients symptomatic for hypocalcemia in the postoperative period received oral or intravenous supplements, depending on severity. All patients are assessed postoperatively for vocal cord palsy. In intermediate and high-risk patients, radioiodine scanning was done.

We conducted follow-up visits for all patients at 1-, 3-, 6, and 12-month intervals in coordination with endocrinologists. Patients underwent thyroid profile test, thyroglobulin, antithyroglobulin antibodies and ultrasonography of the neck. All individual patient's data are entered at each visit to the hospital.

Results

During this study period, 700 patients are admitted to the hospital with various newly diagnosed oncological diseases, including Forty one thyroid cancer patients. Five patients are excluded from studies. Three of them had benign lesions in the postsurgical histopathological examination. Two patients lost during the follow-up period. A total of Thirty six patients were considered for final analysis; thus, thyroid cancers accounted for 2.39% of oncological disease. Females are commonly affected than men with a ratio of 5:1. The population standard deviation is σ 12.55 Table 1.

Table 1: Characteristic of a patient with thyroid cancer (N=36)

Characteristics	Value
Age range (years)	16-66
Mean \pm SD	37.45 \pm 12.56
Median age	33
Gender Percentage (%)	
Female	29 (80.55)
Male	7 (19.44%)
Clinical Symptoms	
Swelling in front of the neck	34 (94.44)
Hoarseness of voice	4 (11.11)
Dyspnoea	1 (2.78)
Lymph node enlargement	3 (8.11)
Bony Pain (Metastasis)	1 (2.78)
Bony Pain (Metastasis)	0 (0)
Duration of symptoms when presented (%)	
<3 months	0 (0)
3 months to 1 year	5 (13.88)
1-3 years	13 (36.11)
3-5 years	5 (13.88)
5-10 years	9 (25)
\geq 10 years	4 (11.11)

A malignant thyroid nodule was found within five years of onset swelling with considerable variation among the patients. In four patients, it is high.

The goitre was classified on USG finding as a multinodular, solitary nodule, lobe involvement, diffuse enlargement of the gland (Table 2).

Table 2: Clinical characteristics of the thyroid

Type of goiter	No of patients	Percentage (N=36)
Multinodular	32	88.89
Solitary Nodule	3	8.33
Diffuse	2	2.78
Lobe involment		
Unilateral	Right Lobe	6
	Left Lobe	3
	Only Isthmus	0
Both the lobe involved	22	61.11
Both the lobes with the Isthmus	5	13.89

All the patients underwent an x-ray neck anterior-posterior view and lateral view. The deviated trachea was found in seven patients. Eight patients had calcification of glands; Tracheal rings are regular.

The majority of FNAC are papillary carcinoma, follicular neoplasia, adenomatous goitre, Colloid goitre, medullary carcinoma. FNAC was repeated in two patients out of three, which are inconclusive initially. One patient did not agree to repeat FNAC patient underwent a frozen section (Table 3).

The American joint committee on cancer 7th edition used to stage the disease (Table 3). Patients underwent standard surgical procedures. All patients underwent vocal cord examination preoperatively as shown in the Table 4.

Eight (20.83%) had postoperative complications; two had permanent hypoparathyroidism, three had unilateral vocal cord palsy, one patients had seroma formation, one patient had surgical site infection. One had a reoccurrence in the cervical lymph node.

Table 3: FNAC and histopathology characteristics of the thyroid gland

Variables	Percentage (%)
Papillary carcinoma	22 (52.77)
Follicular neoplasia	5 (13.88)
Adenomatous goiter	5 (13.88)
Colloid goiter	2 (11.11)
Medullary carcinoma	1 (2.77)
Inconclusive	1 (2.77)
Anaplastic carcinoma	0 (0)
Finale histopathology	
Papillary carcinoma	28 (77.78)
Follicular carcinoma	7 (19.44)
Medullary carcinoma	01 (2.78)
Anaplastic carcinoma	0 (0)
Lymphomas	0 (0)
No. of patients in each stage according to AJCC 7th edition	
Stage I	24 (65.27)
Stage II	4 (12.5)
Stage III	03 (8.33)
Stage IV A	04 (11.11)
Stage IV B	0 (0)
Stage IV C	1 (2.75)

Table 4: Details of surgical treatment

Variables	Percentage (%)
The extent of surgery (n=36)	
Total thyroidectomy	30 (83.33)
Hemithyroidectomy	6 (16.67)
Completion thyroidectomy	4 (11.11)
Neck dissection	
No neck dissection	14 (37.5)
Central	
Unilateral neck dissection	3 (6.94)
Bilateral neck dissection	5 (15.28)
Vocal cord status	
Before Surgery, palsy noted	2 (4.17)
After Surgery	4 (11.1)
Recurrent laryngeal nerve sacrificed due to disease	2 (6.94)
Parathyroid glands	
Number of auto transplantation done	3 (8.33)

Discussion

Most of the patients, 37.5%, are 21-30 years, 23.61% of people are 31-40 years, 19.44% of patients are 41-50 years, and 16.67% are more than 50 years (Table 1). Study by Karkuzhali et al. showed that most of the patients were less than 45 years (73.7%), and the remaining 26.3% of the patients were more than 45 years. Among the study participants, females (80.66%) were more commonly affected than males (19.44%). This gender preference has proven in studies worldwide that women are affected three times more than men, with an estimated 77% of women of the total cases. A similar study undertaken in a tertiary care center in South India for papillary carcinoma showed that out of 377 patients, 307 patients are females, 81.4%. The higher incidence of thyroid malignancy found in females was probably because of endogenous estrogen hormone on thyroid tumor cells. In experimental studies, the estrogen effect on thyroid cells is mediated through estrogen receptor alpha and beta. The alpha receptors upregulation stimulates tumorigenesis, and beta receptors down regulation act as a tumor suppressor.

The typical clinical presentation was the neck swelling in 33 (94.44%) patients. Four patients (11.11%) presented with hoarseness of voice. In addition to thyroid swelling, six patients (16.66%) had enlarged cervical lymph nodes; one patients (2.7%) had severe back pain due to metastatic lesions. Similarly, a study undertaken in Italy showed that 98.7% are presented with swelling in the neck, and cervical nodes were also involved in thirty-one (13%) patients. Another study conducted by Mehrotra et al had different lymphadenopathy incidence findings; 59% are cervical lymphadenopathy, 7.2% are mediastinal lymphadenopathy. The extracapsular thyroid invasion is seen in 10%, and 4.2% had distant metastasis[6,7].

The final diagnosis and associated features in the present study, the histopathology results show papillary carcinoma in 33 (77.78%), follicular carcinoma in seven patients (19.44%), medullary carcinoma in one patient (2.78%). Four patients (11.11%) had metastatic disease, three had in the cervical lymph node, and one patients had a lumbar vertebra. This is like another south Indian study[8,9].

All 36 patients were followed up with ultrasonography of neck, TSH, thyroglobulin, and antithyroglobulin antibody levels, initially at an interval of 3 months for two visits. After the initial two visits once in six months, follow-up visits were done to the surgery department in addition to their routine follow-up with endocrinologists. Three patients (4.16%) were lost during follow-up. One patient (1.38%) died after two years of the primary cause was ARDS, who had follicular carcinoma with vertebral metastasis. After three years of iodine ablation, two patients (2.77%) found had developed cervical lymphadenopathy. On evaluation, these patients found to be having recurrent papillary carcinoma accounting for 2.78%. Samaa et al found with the best practices, recurrence rates have been recorded to range from 8% to 23%. In our study, only 2.78% had a recurrence, but this cannot be compared with other studies as they are long-term for more than ten years[10].

Conclusion

The increased occurrence of thyroid cancer is due to over-diagnosis by higher diagnostic intensity and more intensive medical monitoring, which may be one reason for this growing trend. However, environmental risk factors such as ionizing radiation, excessive iodine use, and obesity may have played a role in the TC rise.

The preferred treatment is a combination of Surgery and adjuvant iodine 131 therapy. Age, sex, tumor size, stage of the disease, the prevalence of the extrathyroidal spread, and completeness of resection all significantly affect the prognosis of a patient. Despite the best practice, recurrence rates are reported in the vicinity of 8% to 23%. Clinical examination, imaging modalities, and markers help in the detection of residual and recurrent disease early. Uncontrolled locoregional or distant illness, on the other hand, can lead to mortality.

Conflict of Interest: Nil Source of support: Nil

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