

A prospective study of histopathological spectrum of thyroid lesions - A three years study**Anuradha Shah¹, Rajesh Para², Amit Shah^{3*}**¹Associate Professor, Department of Pathology, Bidar Institute of Medical Sciences, Bidar, Karnataka, India²Associate Professor, Department of Pathology, Bidar Institute of Medical Sciences, Bidar, Karnataka, India³Associate Professor, Maheswara Medical College, Isnapur, Pattanchuru, Telangana, India

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Abstract

Introduction: The thyroid gland is present in the neck which is enclosed by the pretracheal fascia which is a part of the deep cervical fascia. It is located in front of the 2nd, 3rd, and 4th tracheal rings and weighs around 20–25 gm. This endocrine gland can be affected by a variety of diseases that range from functional and immunological mediated enlargement to neoplastic lesions. Thyroid gland lesions vary in their incidence and histopathological patterns. They may also differ in terms of geographical area, age, sex, dietary, and environmental factors. **Materials and Methods:** This is a prospective study of all patients with thyroid lesions received in Department of Pathology, Department of Pathology, Bidar Institute of Medical Sciences and Bidar. The duration of study was 3 years from January 2018 to December 2020 was carried out. Information obtained included age, sex, clinical diagnosis, histological diagnosis were available. The data were presented in frequency tables. A Sample Size of 119 subjects was studied. Sample size was taken based on the convenience of the study. **Results:** In the present study, females were mostly commonly affected. It was observed that 102 (85.7%) cases were females and 17 (14.3%) cases were male. (Table 1) Male to female ratio was noted to be 6:1. In the present study, most common clinical symptom was swelling in front of the neck seen in almost all cases followed by menstrual irregularity and dyspnoea. In the present study, total thyroidectomies were most common, followed by hemi thyroidectomy specimens, subtotal thyroidectomies and lobectomies. In the present study, out of total 119 cases, 105 cases (88.1%) were diagnosed as non-neoplastic and remaining 14 cases (11.9%) as neoplastic. **Conclusion:** From this study two important observations that has been noticed were that the non-neoplastic lesions are much more common over the neoplastic lesions and the other is that the malignant lesions are seen predominating the benign lesions and of the malignant lesions papillary carcinoma of thyroid is the major constituent.

Keywords: Thyroid gland, menstrual irregularity, dyspnoea, malignant lesions.

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Introduction

The thyroid gland is present in the neck which is enclosed by the pretracheal fascia which is a part of the deep cervical fascia. It is located in front of the 2nd, 3rd, and 4th tracheal rings and weighs around 20–25 gm[1]. This endocrine gland can be affected by a variety of diseases that range from functional and immunological mediated enlargement to neoplastic lesions. Thyroid gland lesions vary in their incidence and histopathological patterns. They may also differ in terms of geographical area, age, sex, dietary, and environmental factors[2]. 5% of the thyroid lesions are neoplastic while the rest are due to inflammatory or developmental reasons. The thyroid gland plays a key physiological role in the body and is responsible for maintaining homeostasis and body integrity[3]. Thyroid gland manifests as gland enlargement (goiters) or as alterations in hormone levels or as both[4]. Around 42 million people are affected by thyroid diseases in India[5]. 4%–5% of the population present with clinically visible thyroid nodules[6]. Majority of the thyroid lesions are non-neoplastic and <5% are malignant[7].

USG, thyroid function tests, fine-needle aspiration cytology (FNAC), and radio nucleotide scan along with FNAC are the initial screening procedures done for the evaluation of thyroid diseases.

Developmental, inflammatory, hyperplastic, and neoplastic diseases are common globally in clinical practice. Literature states that an estimated 200 million people present with thyroid diseases worldwide and about one-third of this population lives in iodine-deficient areas. The etiology of thyroid diseases is multifactorial. Iodine deficiency, radiation exposure, hormonal imbalance, genetic, dietary, and goitrogenic factors may play a role in its pathogenesis. Papillary carcinoma is the most common thyroid carcinoma followed by follicular, medullary, and anaplastic carcinoma. These may be associated with clinical conditions of hyperthyroidism or hypothyroidism. Surgical excision and pathological evaluation are crucial to establish a proper diagnosis. This study was undertaken to describe the spectrum, frequency, age, sex distribution and various histopathological patterns of thyroid lesions.

Materials and methods

This is a prospective study of all patients with thyroid lesions received in Department of Pathology, Department of Pathology, Bidar Institute of Medical Sciences and Bidar. The duration of study was 3 years from January 2018 to December 2020 was carried out. Information obtained included age, sex, clinical diagnosis, histological diagnosis were available. The data were presented in frequency tables. A Sample Size of 119 subjects was studied. Sample size was taken based on the convenience of the study.

Inclusion Criteria

Lobectomy, Hemi thyroidectomy, subtotal thyroidectomy and total thyroidectomy specimens received for histopathological examination which were suspected for inflammatory, non-neoplastic and neoplastic lesions of thyroid.

Exclusion Criteria

1. History of any genetic/ congenital thyroid disease.
2. Antenatal cases having thyroid abnormalities.
3. Thyroid disorders caused due to drug intake/side effects.

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Study Subjects

In this study, a total of 119 patients who presented with swelling in thyroid were taken. The detailed clinical details regarding age, gender along with ultra-sonographic (USG) findings, thyroid scan, related investigations (euthyroid, hyperthyroid, and hypothyroid), and operative findings were recorded from the histopathology Performa and were taken into consideration. Fine needle aspiration was the most commonly used pre-operative assessment method for most thyroid swellings information. Gross features of the specimen received were recorded. Representative tissue was taken and after processing the tissue, routine staining was carried out with haematoxylin and eosin (H&E) stain. The disorders of thyroid were classified on histological basis into non-neoplastic and neoplastic lesions which were further sub-classified as benign and malignant as per the World Health Organization (WHO) classification of tumours of endocrine organs (fourth edition).

Statistical Analysis

Data was analyzed using Microsoft Excel and chi-square test. Statistical package for social sciences (SPSS) software was used.

Results

In the present study, a total of 238 patients with thyroid swellings were taken for the study for a period of two years from 2017-2018. The age of the patients ranged from 10 years to 80 years with a mean age of 37 years. Maximum number of lesions were seen in patients in the age group of 41-50 years (n=70, 29%) followed by 31-40 years (n=28, 21%) and 21-30 years (n=29, 14%).

Table 1: Sex distribution of thyroid lesions

Gender	No of cases	Percentage
Male	17	14.3%
Female	102	85.7%
Total	119	100%

Table 2: Lesions of Thyroid

Lesions	No of cases	Percentage
Non-Neoplastic	105	88%
Neoplastic	14	12%
Total	119	100%

In the present study, females were mostly commonly affected. It was observed that 102 (85.7%) cases were females and 17 (14.3%) cases were male. (Table 1) Male to female ratio was noted to be 6:1. In the present study, most common clinical symptom was swelling in front of the neck seen in almost all cases followed by menstrual irregularity and dyspnoea. In the present study, total thyroidectomies were most common, followed by hemi thyroidectomy specimens, subtotal thyroidectomies and lobectomies. In the present study, out of total 119 cases, 105 cases (88.1%) were diagnosed as non-neoplastic and remaining 14 cases (11.9%) as neoplastic.

In the present study, among 105 cases of non-neoplastic lesions, multi nodular goiter (MNG) 66 cases (55.4%) was found to be the most common followed by lymphocytic thyroiditis 21 cases (17.6%), Hashimoto's thyroiditis 11 cases (9%) and adenomatous goiter 7 cases (5.6%) and granulomatous thyroiditis.

In the present study, benign tumours were more common than malignant tumours. Out of 14 neoplastic lesions 5 cases (33.3%) were benign tumours and 9 cases (66.6%) were malignant tumours. In the present study, among 14 cases of neoplastic lesions, follicular adenoma comprised of 8 cases - 29.8% was found to be the most common followed by papillary carcinoma which comprises of 8 cases (57.8%), follicular variant of papillary carcinoma, 1 cases, follicular carcinoma and non-Hodgkin's lymphoma one case each. In the present study, out of 8 cases of papillary carcinoma, classic variant was seen in 5 cases, followed by micro papillary carcinoma 3 cases.

Discussion

The thyroid gland diseases are common and composed of an array of entities causing systemic disease (grave's disease) or a localized abnormality in the thyroid gland such as nodular enlargement (goiter)

or a tumour mass. Both the neoplastic and non-neoplastic diseases of thyroid are common all over the world, with diversity in frequency and incidences depending upon iodine deficiency status. In our present study, the age of the patients ranged from 10 years to 80 years with a mean age of 47 years which was similar with the study of Arvintham, Urmila devi et al, Silverman et al and which were lower when compared with study conducted by Sathiyamurthy et al with 36.5 years, et al with mean ages of 44.8 and 46 years respectively.

In our present study the commonest age group presenting with thyroid disorders was in the 4th to 5th decade which was correlating with the study by sreedeivi et al while study carried out by Jagadale K et al and Ramesh V L et al was found to be 4th to 6th decades and 3rd to 5th decade respectively. In the present study, it was observed that 204 (85.7%) cases were females and 34 (14.2%) cases were male. The female to male ratio found in this study was 6:1, which on comparison with the studies by Nzegwu et al, Abdulkareem et al, Sudha et al, and Nggada et al 6:1, 5.7:1, 7:1 and 6.2:1 respectively and was favouring with our study. In women the high frequency of developing thyroid disorders is considered to be due to the physiological demands of puberty, menstruation, pregnancy and lactation. A considerable number of the cases in this study were non-neoplastic thyroid lesions constituting 419 cases (88%) of the cases. This observed significance of non-neoplastic lesions in our study is in accord with findings from savani et al. Chung et al and Hill et al which was 62.5%, 84.1% and 60.5% respectively.

In our study the most predominant thyroid lesion encountered is nodular colloid goiter and was commonly seen in the 4th decade. It constituted 55.4% of all lesions similar to a study by Illorin and Sreedeivi et al. Multi nodular goiter (MNG) is the end-stage result of diffuse hyperplastic goiter. Excessive metabolic demands in this condition will lead to the increased enlargement of the thyroid gland and this is one of the important reason for the thyroid enlargement in women during puberty and pregnancy which is considerably common. Constant stimulation by the TSH released from the anterior pituitary results in multi-nodular goiter (MNG). Main reason for colloid goiter is iodine deficiency. The daily iodine requirement is about 100-125 µg. It is treated by iodized salt used for food and also iodine-containing preparations. If the iodine deficiency state sustains for a long period of time, it results in the accumulation of colloid material in the gland and lead to colloid goiter. The puberty goiter, pregnancy goiter, and colloid goiter if left untreated will change to MNG.

In our study the lymphocytic thyroiditis constituted 42 cases (17.6%) and it was seen most common in the 3rd decade. Which was in correspondence with Illorin et al. Hashimoto thyroiditis constituted 43 cases (9%) was seen most common in the 4th decade. Hashimoto thyroiditis is an auto immune disease characterized by widespread lymphocytic infiltration, fibrosis and parenchymal atrophy with oxyphilic changes. It is a painless goiter and there are no early symptoms. In our study, malignant lesions 18 cases (66.6%) predominated over benign 19 cases (33.3%) within the neoplastic category. Our findings in this regard are similar to the study of Beigh et al and Abdulkader et al who reported, among which 81% and 88.8% were malignant respectively.

Among the 14 cases of the neoplastic thyroid lesions in this study, 5 case (29.8%) are follicular adenomas which was correlating with Prabha et al. Follicular adenomas may be inactive or active. Depending on their level of function follicular adenomas can be described as cold, warm, or hot. A thyroid adenoma is differentiated from an MNG in that an adenoma is solitary, encapsulated and arises from a genetic mutation in a single precursor cell. To differentiate a follicular adenoma from follicular carcinoma cautious histopathological examination is necessary[9,10].

Conclusion

In our study, thyroid diseases showed definite female predominance, with most of them occurring in an age group of 41-50 years. Multi nodular goiter is the most common thyroid condition which was seen occurring clinically, radiologically, and cytologically. In our study follicular adenoma was the most common benign neoplastic disease and papillary carcinoma was the most common malignant lesion.

Fine-needle aspiration findings and ultra-sonogram findings was in consonance with histopathological findings as far as papillary carcinoma was concerned. From this study two important observations that has been noticed were that the non-neoplastic lesions are much more common over the neoplastic lesions and the other is that the malignant lesions are seen predominating the benign lesions and of the malignant lesions papillary carcinoma of thyroid is the major constituent.

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