

# Spectrum of Thyroid Disease reported to Department of Pathology District General Hospital Matara

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## Abstract

**Objectives:** This study aimed to characterize the cyto pathological and histopathological pattern of thyroid lesions and to highlight the age and gender variations of these lesions.

**Materials and Methods:** We retrospectively analyzed the data from thyroid specimens including FNAC and the surgical pathology samples received at the Department of Pathology, District General Hospital Matara from June 2014 to January 2015.

**Results:** The 1000 specimens, 929 FNAC and 71 thyroidectomy specimens received during the study period came from (95.69%) 887 females and (4.31%) 40 males in FNAC specimens and from (92.95%) 66 females and (7.05%) 05 males. Age of the patients ranged from 04 years to 92 years. 904 (97.3%) cases were found to be non-neoplastic and 25 (2.7%) cases were neoplastic in FNAC and 34 (47.88%) cases were found to be non-neoplastic and 21 (29.57%) cases benign and 16 (22.53%) were malignant lesions in thyroidectomy specimens. The non-neoplastic group in FNAC included: colloid goiter, including both diffuse and nodular goiter (395 cases; 42.5%), colloid cyst (107 cases; 11.5 %) and Hashimoto/chronic lymphocytic thyroiditis (244 cases; 26.6%). In neoplastic lesions in thyroidectomies, there were benign tumors and malignant tumors. Among the benign tumors, 20 were follicular adenomas and 01 was a Hurthle cell adenomas. Papillary carcinoma was the commonest malignant tumor accounting for 50% of all thyroid malignancies, followed by, papillary micro carcinoma (25%) and follicular carcinoma (12.5%).

**Conclusions:** Non-neoplastic thyroid lesions were more common than neoplastic ones. Colloid goiter was the most common lesion. Follicular adenoma was the commonest benign tumor and papillary carcinoma was the commonest malignant lesion.

## Introduction

Thyroid enlargement is a frequent clinical presentation of thyroid disease (1). Thyroid lesions could be pathologically divided in to neoplastic lesions, hyperplastic lesions and inflammatory lesions. The neoplastic lesions could

be divided in to benign & malignant. Malignant lesions include papillary carcinoma, follicular carcinoma, Hurthle cell carcinoma, medullary carcinoma and Lymphoma. The benign lesions are the adenomas including follicular and Hurthle cell adenomas. The hyperplastic lesions include the Nodular hyperplasia or nodular goitre or focal hyperplasia in a colloid goitre. Inflammatory lesions are Auto Immune Thyroiditis (AIT) ie Hashimoto's thyroiditis and lymphocytic thyroiditis. The diagnosis of thyroid lesions is done using the clinical judgment, ultra sound scan of the neck & fine needle aspiration cytology (FNAC) (2). FNAC of the thyroid sensitivity ranges from 77-93% and the specificity ranging between 67-100 %.(3-5). Matara District has a population of 831 000 (6). It consists of major cities like Matara, Devinuwara, Kamburupitiya, Akuressa, Deniyaya & Hakmana. The patients who present to Matara District General Hospital are from all these cities and this represents the Matara District from the Southern province. Thyroid diseases are quiet common. The reported prevalence of thyroid disease is approximately 7% in the general population (7). The incidence of thyroid diseases varies from one geographic region to another mainly depending on the iodine status. (1,8) Other etiological factor also contribute to a certain extend. Therefore the disease pattern varies according to the geographic distribution (9). Thyroid cancer is prevalent in Europe & America (10). The goitres are more common in areas are more common in areas with iodine deficiency (11). According to the American cancer society about 60220 new cases of thyroid cancers were estimated in 2013, out of which more than 75% were expected in females. According to the statistics published by the NCC thyroid carcinoma are the seventh commonest cancer in Sri Lanka and the fourth common cancer in females (12). There are number of studies from Asia, just to site some of the recent works on the disease pattern of thyroid disease in Pakistan, Bangladesh & other parts of Asian Continent (13-16). In a study from India, on adolescents and young adults, thyroid carcinoma was found to be one of the five most common carcinomas. (16)

## Materials and Methods

This was a retrospective study of thyroid specimens received at the Department of Pathology, District General Hospital Matara from June 2014 to January 2015. All patients presenting with thyroid enlargement, who underwent any type of thyroid operation (i.e. lobectomy, subtotal thyroidectomy, or total thyroidectomy) and

FNAC were included in this study. Demographic data including patients's age, sex and the histopathologic and cytopathologic diagnosis were collected from pathology reports and were analyzed. The thyroid diseases were classified on histological and cytological grounds into: colloid goiter (both diffuse and nodular goiter), adenoma (both follicular and hurthle cell type), all types of thyroiditis and carcinoma including all subtypes that is follicular, papillary and medullary carcinoma.

## Results

A total of 1000 specimens were received in the Department of Pathology, District General Hospital Matara from June 2014 to January 2015. There were 929 FNAC and 71 Thyroidectomies. In FNAC the pediatric age group (< 12 years) constitute 05 (0.53%) and 924 adult age group (> 12 years) (99.5%). The age of the studied cases ranged from 04 years- to 92 years with a mean age- years. The majority of the thyroid diseases (n=456; 49.1 %) were seen in the age group 40-64 years. The young age group (≤20 years) (n=41) and the elderly age group (above 65 years) (n=83) constituted 4.42% and 8.9 % respectively (Table 1). In thyroidectomies the pediatric age group (< 12 years) constitute 01 (1.4%) and 70 adult age group (> 12 years) (98.6%). The majority of the thyroid diseases (n=36; 50.7 %) were seen in the age group 40-64 years. The young age group (≤20 years) (n=03) and the elderly age group (above 65 years) (n=06) constituted 4.22% and 8.45 % respectively (Table 2). There were 954 females (95.49%) and 46 males (4.51%) giving a female: male ratio of 0.95:0.05 In this study, non-neoplastic lesions were more common in both FNAC and thyroidectomies, and it accounted 97.63% (n=907) and 47.88% (n=34) cases respectively. The most common cause of goiter was colloid goiter including diffuse and nodular goiter and accounts for 42.51% and 11.19% of the FNAC reviewed and 43.6% of the thyroidectomies. It is 43.69% and 91.17% of all non-neoplastic lesions in FNAC and thyroidectomies respectively (Table 3,4). Of these cases 379 (96.16%) were females and 15 (3.84%) were males in FNAC and 28 (90.32%) females and 03 (9.68%) males in thyroidectomies, and in FNAC with female to male ratio . Most of the patients (n=204; 21.95%) were between 40-64 years of age (Table 3, 4). The commonest clinical presentation was a diffuse goiter in the study population (n=368, 39.69%). In females the pattern was the same, but however in males the commonest clinical presentation was a solitary thyroid nodule (n=15, 38.46%). Out of the neoplastic lesions in the thyroidectomies commonest benign lesion was follicular adenoma (n=20 54.05%) and the malignant lesion was papillary carcinoma (n=08 21.62%)

## Discussion

Both the neoplastic and non-neoplastic diseases of thyroid are common all over the world, with a varying frequency and incidences depending upon iodine deficiency status. Numerous epidemiological and hospital based researches are available. Although it is reported to be rare in some developed countries like UK, however it is one of the fastest growing tumor in both sexes (Cancer Research UK, 2011). Similarly a number of studies on thyroid disease are also available from all over the world including Pakistan, Bangladesh and other parts of the Asian continent

Thyroid diseases have historically been known primarily to affect the female sex. Similar are the finding in our study which constitute to 95.7% in FNAC and 91.54% in thyroidectomies. In a study of 358 thyroidectomies from Pakistan it was around 71.5%. Regarding age range of neoplastic lesions in FNAC and thyroidectomies it was 40-64 years. However papillary carcinoma presentation had a younger age group which is 20-39years. We had 929 FNAC and 71 thyroidectomies. There were a total of 25 cases of FNAC diagnosed Thy-3, Thy-4 and Thy-5 lesions in which the management is thyroidectomy either total or lobectomy. Only 06 patients have undergone thyroidectomy at the District General Hospital-Matara. Out of these patients 05 were malignant lesions. Rest of the malignant lesions diagnosed in the thyroidectomy specimens were newly diagnosed patients.

The number papillary carcinoma diagnosed in the study was 11.2% Thyroid cancer constitutes about 9% of all malignancies. Papillary adenocarcinoma was the most common histological subtype followed by papillary micro carcinoma. It was more common in females than the males and the presenting age was 20-39 years. Some studies have concluded that thyroid cancer incidence rates have increased exponentially between 2000 and 2010 and there is significant geographical variation in the incidence of thyroid cancer . Thyroid cancer has become the fourth most common cancer among young Sri Lankan women. In addition to being consistent with the hospital based histopathological studies that papillary carcinoma is the commonest malignancy of thyroid and its frequency is increasing. The incidental papillary carcinoma is more common in females.

Thus in conclusion, non-neoplastic thyroid lesions are more common than neoplastic ones, with colloid goiter being the most common lesion. Follicular adenoma is the common benign tumor and papillary carcinoma is the commonest malignant lesion. There appears to be a slightly increased trend of papillary carcinoma diagnosis.

**Table 1. Age and Sex Distribution of Patients with Thyroid lesion-FNAC specimen**

| Age          | Number     | Percentage | Male      | Percentage | Female     | Percentage |
|--------------|------------|------------|-----------|------------|------------|------------|
| Upto 12 yrs  | 05         | 0.53%      | 02        | 5%         | 03         | 0.33%      |
| 13-19 yrs    | 41         | 4.42%      | 01        | 2.5%       | 40         | 4.5%       |
| 20-39 yrs    | 346        | 37.21%     | 08        | 20%        | 337        | 37.99%     |
| 40-64 yrs    | 456        | 48.86%     | 21        | 47.5%      | 435        | 48.92%     |
| >65 yrs      | 83         | 8.95%      | 10        | 25%        | 73         | 8.22%      |
| <b>Total</b> | <b>929</b> |            | <b>41</b> |            | <b>888</b> |            |

**Table 2 . Age and Sex Distribution of Patients with Thyroid lesion-Thyroidectomy specimen**

| Age          | Number    | Percentage | Male      | Percentage | Female    | Percentage |
|--------------|-----------|------------|-----------|------------|-----------|------------|
| Up to 12 yrs | 01        | 1.40%      | 00        |            | 01        | 1.51%      |
| 13-19 yrs    | 03        | 4.22%      | 00        |            | 03        | 4.54%      |
| 20-39 yrs    | 24        | 33.8%      | 02        | 40%        | 22        | 33.33%     |
| 40-64 yrs    | 36        | 50.7%      | 00        |            | 36        | 54.54%     |
| >65 yrs      | 06        | 8.45%      | 03        | 60%        | 03        | 4.54%      |
| <b>Total</b> | <b>71</b> |            | <b>05</b> |            | <b>66</b> |            |

**Table 3. Age Distribution of Patients with Thyroid Lesions- FNAC**

| Age          | Colloid goiter | colloid nodule | Colloid cyst | Focal hyperplasia | AIT        | Colloid goiter/AIT | Follicular hyperplasia | Suspicious for malignancy | Malignant |
|--------------|----------------|----------------|--------------|-------------------|------------|--------------------|------------------------|---------------------------|-----------|
|              |                |                |              |                   |            |                    | Thy-3                  | Thy-4                     | Thy-5     |
| Up to 12 yrs | 01             | -              | -            | -                 | 04         | -                  | -                      | -                         | -         |
| 13-19 yrs    | 19             | -              | 02           | 01                | 19         | -                  | -                      | -                         | -         |
| 20-39 yrs    | 145            | 31             | 33           | 12                | 110        | 09                 | 01                     | 02                        | 03        |
| 40-64 yrs    | 204            | 55             | 66           | 14                | 94         | 12                 | 04                     | 05                        | 02        |
| >65 yrs      | 28             | 18             | 06           | 06                | 17         | -                  | 02                     | 03                        | 03        |
| <b>Total</b> | <b>395</b>     | <b>104</b>     | <b>107</b>   | <b>33</b>         | <b>244</b> | <b>21</b>          | <b>07</b>              | <b>10</b>                 | <b>08</b> |

**Table 4. Age Distribution of Patients with Thyroid Lesions in Thyroidectomy specimens**

| Age          | Nodular hyperplasia | AIT       | Follicular Adenoma | Hurthle cell adenoma | Follicular carcinoma | Papillary micro carcinoma | Papillary carcinoma | Hurthle cell carcinoma | Anaplastic carcinoma |
|--------------|---------------------|-----------|--------------------|----------------------|----------------------|---------------------------|---------------------|------------------------|----------------------|
| Up to 12 yrs | 01                  | -         | -                  | -                    | -                    | -                         | -                   | -                      | -                    |
| 13-19 yrs    | 02                  | -         | -                  | -                    | -                    | -                         | 01                  | -                      | -                    |
| 20-39 yrs    | 11                  | -         | 07                 | 01                   | -                    | 01                        | 04                  | 01                     | -                    |
| 40-64 yrs    | 13                  | 03        | 11                 | -                    | 02                   | 03                        | 03                  | -                      | 01                   |
| >65 yrs      | 04                  | -         | 02                 | -                    | -                    | -                         | -                   | -                      | -                    |
| <b>Total</b> | <b>31</b>           | <b>03</b> | <b>20</b>          | <b>01</b>            | <b>02</b>            | <b>04</b>                 | <b>08</b>           | <b>01</b>              | <b>01</b>            |

**Table 5. Sex Distribution of Patients with Thyroid Lesions- FNAC**

| Sex          | Colloid goiter | colloid nodule | Colloid cyst | Focal hyperplasia | AIT        | Colloid goiter/AIT | Follicular hyperplasia<br>Thy-3 | Suspicious for malignancy<br>Thy-4 | Malignant<br>Thy-5 |
|--------------|----------------|----------------|--------------|-------------------|------------|--------------------|---------------------------------|------------------------------------|--------------------|
| Male         | 15             | 04             | 07           | 02                | 04         | -                  | 01                              | 03                                 | 02                 |
| Female       | 379            | 100            | 100          | 31                | 240        | 21                 | 06                              | 07                                 | 06                 |
| <b>Total</b> | <b>394</b>     | <b>104</b>     | <b>107</b>   | <b>33</b>         | <b>244</b> | <b>21</b>          | <b>07</b>                       | <b>10</b>                          | <b>08</b>          |

**Table 6. Sex Distribution of Patients with Thyroid Lesions- Thyroidectomy**

| Sex          | Nodular hyperplasia | AIT       | Follicular Adenoma | Hurthle cell adenoma | Follicular carcinoma | Papillary micro carcinoma | Papillary carcinoma | Hurthle cell carcinoma | Anaplastic carcinoma |
|--------------|---------------------|-----------|--------------------|----------------------|----------------------|---------------------------|---------------------|------------------------|----------------------|
| Male         | 03                  | -         | 01                 | -                    | -                    | -                         | 01                  | 01                     | -                    |
| Female       | 28                  | 03        | 19                 | 01                   | 02                   | 04                        | 07                  | -                      | 01                   |
| <b>Total</b> | <b>31</b>           | <b>03</b> | <b>20</b>          | <b>01</b>            | <b>02</b>            | <b>04</b>                 | <b>08</b>           | <b>01</b>              | <b>01</b>            |

**Table 7. Thyroid Disease Pattern according to the clinical Presentation - FNAC**

| Clinical presentation | Colloid goiter | colloid nodule | Colloid cyst | Focal hyperplasia | AIT        | Colloid goiter/AIT | Follicular hyperplasia<br>Thy-3 | Suspicious for malignancy<br>Thy-4 | Malignant<br>Thy-5 |
|-----------------------|----------------|----------------|--------------|-------------------|------------|--------------------|---------------------------------|------------------------------------|--------------------|
| Multi nodular goiter  | 120            | 47             | 24           | 12                | 47         | 04                 | 02                              | 01                                 | 01                 |
| L/lobe                | 14             | 02             | 10           | 02                | 05         | 02                 | -                               | 03                                 | -                  |
| R/lobe                | 28             | 08             | 18           | 02                | 10         | 02                 | -                               | 02                                 | 01                 |
| Diffuse goiter        | 186            | 03             | 03           | 02                | 163        | 11                 | -                               | -                                  | 01                 |
| STN                   | 47             | 44             | 52           | 15                | 19         | 02                 | 05                              | 04                                 | 05                 |
| <b>Total</b>          | <b>395</b>     | <b>104</b>     | <b>107</b>   | <b>33</b>         | <b>244</b> | <b>21</b>          | <b>07</b>                       | <b>10</b>                          | <b>08</b>          |

**Table 8. Clinical Presentation according to the Sex distribution- FNAC**

| Clinical presentation | Male number | Percentage | Female number | Percentage |
|-----------------------|-------------|------------|---------------|------------|
| Multi nodular goiter  | 08          | 20.5%      | 249           | 28.4%      |
| L/lobe                | 02          | 5.1%       | 67            | 7.5%       |
| R/lobe                | 04          | 10.2%      | 36            | 4.05%      |
| Diffuse goiter        | 10          | 25.6%      | 358           | 40.3%      |
| STN                   | 15          | 38.4%      | 177           | 19.9%      |
| <b>Total</b>          | <b>39</b>   |            | <b>888</b>    |            |

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