

A Retrospective Histopathological Investigation of Neoplastic Lesions of Thyroid in A Tertiary Care Centre

Vivek Kumar Pandey¹, Rituraj², Vimal Kumar Gupta³, Awadhesh Singh⁴

¹Tutor, Department of Pathology, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India

²Tutor, Department of Pathology, Government Medical College, Bettiah, Bihar, India.

³Assistant Professor, Department of Pathology, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India

⁴Assistant Professor, Department of Pathology, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India

Received: 21-10-2021 / Revised: 03-11-2021 / Accepted: 28-11-2021

Corresponding author: Dr. Vivek Kumar Pandey

Conflict of interest: Nil

Abstract

Aim: Histopathological study of neoplastic lesions of thyroid in a tertiary care centre in Bihar region.

Methods: This retrospective study was carried out in the Department of Pathology, Sri Krishna medical college and Hospital, Muzaffarpur, Bihar, India, for 15 months. The material for this study consisted of thyroidectomy specimens including lobectomy, partial thyroidectomy, subtotal thyroidectomy and total thyroidectomy. Every patient was preoperatively assessed by FNAC. Detailed information regarding age, gender, clinical details (hypothyroid, hyperthyroid and euthyroid), relevant investigations like Fine Needle Aspiration Cytology, USG reports, thyroid scan and operative findings were obtained from histopathological report forms.

Results: 80% cases were found to be females and 20% cases were males with a female: male ratio of 4:1. Among total of 100 neoplastic lesions, 27 cases were adenomas 21 cases of follicular adenoma and 6 cases of Hurthle cell adenoma were diagnosed accounting for 21% and 6% respectively of all neoplastic thyroid lesions. The age of the studied benign thyroid neoplastic lesions ranged from 11 years to 67 years with a mean age of 37.95 years and the relative peak age of incidence was seen in 20-30 years age group (28%). The young age group (≤ 20 years) and the elderly age group above 60 years constituted 9% and 5% of cases respectively. Malignant thyroid lesions accounted for 73% (n=73) of all neoplastic lesions. Papillary carcinoma was the commonest malignant tumor in this study seen in 60(82.19%) of all malignant lesions. Of these cases, 10(16.67%) were males and 50 (83.33%) were females with a female: male ratio 5:1. Most of the patients (n=18; 30%) were between 20-30 years of age. 8 cases of follicular carcinoma and 4 cases of medullary carcinoma were encountered in this study, comprising of 8% and 4% of all malignant neoplasms respectively. No case of anaplastic carcinoma was seen in our study.

Conclusion: Thus, in conclusion, females accounted for 80% of patients with neoplastic thyroid lesions and the incidence peaked at a younger age. Papillary carcinoma was the most frequent thyroid cancer accounting for 60% of thyroid cancers and follicular adenoma was the common benign tumor.

Keywords: neoplastic lesions, thyroid.

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Introduction

Thyroid gland is one of the important organs which plays vital physiological roles in the body. Thyroid gland is responsible for the maintenance of homeostasis and body integrity [1]. Diseases of the thyroid gland are common endocrine disorders encountered globally and the incidence varies from one geographical region to another. Thyroid diseases manifest as enlargement of thyroid gland (goiters) or alterations in its hormonal levels or both [2]. Among all the endocrine disorders thyroid disorders are the most common in India [3]. In India, 42 million people are affected by thyroid diseases [4]. Clinically apparent thyroid nodules are seen in 4-5% of population [5]. Majority of the thyroid swellings are non-neoplastic. Only less than 5% are malignant [6]. The initial screening procedures in the evaluation of thyroid lesions include ultra-sonogram, thyroid function test, FNAC, radio nucleotide scan among which FNAC is considered to be the best initial diagnostic procedure. In clinical practice developmental, inflammatory, hyper plastic and neoplastic diseases of thyroid are common worldwide [7]. Biosynthetic defects, autoimmune diseases and nodular diseases can lead to goiter. This study is undertaken to identify the frequency of various thyroid lesions in thyroidectomy specimens and categorize them into neoplastic and non-neoplastic lesions.

Material and methods

This retrospective study was carried out in the Department of Pathology, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India, for 15 months.

Methodology

The material for this study consisted of thyroidectomy specimens including lobectomy, partial thyroidectomy, subtotal thyroidectomy and total thyroidectomy. The decision to operate on the patient was based on clinico-radiological findings,

cytology and other relevant laboratory investigations. Every patient was preoperatively assessed by FNAC. Some of the patients had undergone thyroid scanning and ultrasonography of thyroid gland. Detailed information regarding age, gender, clinical details (hypothyroid, hyperthyroid and euthyroid), relevant investigations like Fine Needle Aspiration Cytology, USG reports, thyroid scan and operative findings were obtained from histopathological report forms. Gross features of the specimen received were recorded. Representative tissue was taken and after processing the tissue, routine staining was carried out with hematoxylin and eosin (H&E) stain. For retrospective study the histopathology slides were retrieved from the archive and reviewed.

The thyroid diseases were classified on histological grounds into non-neoplastic and neoplastic lesions that were further sub-classified as benign and malignant as per the WHO histological classification of thyroid tumors.

Statistical analysis

The data was subsequently analyzed and presented in a tabulated form with the help of Microsoft office 2009.

Results

A total of 125 thyroid specimens were received, Neoplastic lesions were found in 100 cases (80%) of thyroidectomy specimens and were mainly adenomas and carcinomas. 80% cases were found to be females and 20% cases were males with a female: male ratio of 4:1. Among total of 100 neoplastic lesions, 27 cases were adenomas (27% of the neoplastic category). 21 cases of follicular adenoma and 6 cases of Hurthle cell adenoma were diagnosed accounting for 21% and 6% respectively of all neoplastic thyroid lesions (Table 1). The age of the studied benign thyroid neoplastic lesions ranged from 11 years to 67 years with a mean age of 37.95 years and the

relative peak age of incidence was seen in 20-30 years age group (28%). The young age group (≤ 20 years) and the elderly age group above 60 years constituted 9% and 5% of cases respectively. In this study 1 patient of 34 years age was diagnosed as having Well-differentiated tumor of uncertain malignant potential (WDT-UMP) as there were suspicious nuclear features seen, with no capsular invasion. Malignant thyroid lesions accounted for 73% (n=73) of all neoplastic lesions. The age of the studied malignant thyroid neoplastic cases ranged from 11 years to 71 years with relative peak age of incidence in the age

group of 20- 30 years followed by 2nd highest peak in 30-40 years age group. (Table 2). Papillary carcinoma was the commonest malignant tumor in this study seen in 60(82.19%) of all malignant lesions. Of these cases, 10(16.67%) were males and 50 (83.33%) were females with a female: male ratio 5:1. Most of the patients (n=18; 30%) were between 20-30 years of age. 8 cases of follicular carcinoma and 4 cases of medullary carcinoma were encountered in this study, comprising of 8% and 4% of all malignant neoplasms respectively. No cases of anaplastic carcinoma were seen in our study.

Table 1: Gender distribution as per histologic type

Histologic type	Gender		Total
	Female	Male	
Follicular Adenoma	16	5	21
Hurthle cell Adenoma	5	1	6
Papillary Ca	50	10	60
Follicular Ca	5	3	8
Medullary Ca	3	1	4
WDT-UMP	1	0	1
Total	80	20	100

Table 2: Age distribution of patients with neoplastic thyroid lesions

Age (In years)	Benign		Malignant			WDT-UMP	Total (%)
	Follicular Adenoma	Hurthle cell Adenoma	Papillary Carcinoma	Follicular Carcinoma	Medullary Carcinoma		
Below 20	1	1	6	1	-	-	9
20-30	6	2	18	1	1	-	28
30-40	6	1	15	2	1	1	26
40-50	5	2	11	1	1	-	20
50-60	1	1	6	2	1	-	11
60-70	2	-	2	1	-	-	5
Above 70	-	-	1	-	-	-	1
Total	21	6	60	8	4	1	100

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 [2]. In India about 42 million people suffer from thyroid diseases[8]. Diseases of the thyroid are of

great importance as most can be controlled by medical or surgical management [9]. Thyroidectomy, presently, has become a routine procedure as a result of safe anesthesia, antiseptics, fine surgical instruments, developments of new techniques and is offering the chances of cure to many patients [10].

In our study thyroidectomy specimens constituted 1.25% of all the surgical pathology specimens received in our department. Abdulla et al (2006) also found that thyroid specimens constituted 1.5% of all histopathology specimens in their study [11]. Historically thyroid diseases have been found to have a female preponderance owing to the presence of estrogen receptors in the thyroid tissue [12]. There were 80% female cases and 20% male cases in our study with a female: male ratio of 4:1. Similar results have been found in the studies conducted by Ashwini et al (2014), Gupta A et al (2016), Salama et al. (2009), Fahim et al(2012) and Mandal S, et al [13,17].

In our study the age of patients ranged from 11-64 years in benign neoplasms with a mean age of 37.95 years and 11-71 years in malignant neoplasms with mean of 41.2 years. Similar results were found by a study conducted by Darwish et al. (2006), where the age range was 21-82 years in malignant lesions and 20-69 in adenomas [11]. In the study conducted by Singh P et al. (2000), of 108 cases age range was 12-80 years, mean age was 47 years [18]. Similar results were found by Fahim et al. (2012) and Veyseller et al. (2009) [16,19]. The peak age of incidence in our study was 40-50 years age group for benign neoplasms and 20-30 years age group for malignant neoplasms which is in accordance with the study of Gupta A et al (2016) who found 21-40 years age group as the peak age for thyroid diseases [14]. Islam et al. (2009), showed the majority of the patients were within 21-40 years of age [20].

In our study, malignant lesions predominated over benign adenomas within the neoplastic category. Our findings in this regard are similar to the study of Abdulkader et al. (2014) who reported 81 neoplastic cases, among which 88.8% were malignant [21]. Papillary carcinoma was the most common malignant thyroid lesion and constituted 60% of the malignant

lesions in our study. This observation was in accordance with the study of Chukudebelu et al. (2012), Abdulkader et al. (2014) and Gupta A et al (2016) [14,21,22]. Our results are consistent with the international remote and recent data regarding the pattern and frequency of neoplastic diseases of thyroid, including the predominance of papillary carcinoma. Our finding regarding increased trend of papillary carcinoma diagnosis among malignant thyroid tumors is also consistent with that of Yang et al. (2013), Yildiz et al. (2014) and Amphlett et al. (2013) [23,25].

Follicular adenoma was the commonest benign thyroid neoplasms in our study accounting for 77.78% of benign neoplasms which is in accordance with Ariyibi et al. (2013) who found 89.5% cases to be follicular adenomas [26].

Conclusion

Thus, in conclusion, females accounted for 80% of patients with neoplastic thyroid lesions and the incidence peaked at a younger age. Papillary carcinoma was the most frequent thyroid cancer accounting for 60% of thyroid cancers and follicular adenoma was the common benign tumor.

Reference

1. Mausavi S J, Mikaili. P, Mehdioghlir. Demographic and Histopathological study of thyroidopathies led to thyroid surgeries in Urmia Imam Hospital, Northwestern Iran Annals of Biological Research, 2011; 2:5.
2. Wartosfskyl. Diseases of the thyroid Fauci A.S Braunwald E, et al; Ed. Principles of Internal Medicine 14th edition. 1998; 2012- 2035.
3. Kochupillai N. Clinical endocrinology in India. Currsci 2000; 79; 1061-7.
4. Unnikrishnan A G, Menon U V. Thyroid Disorders in India an epidemiological perspective. Indian Journal of Endocrinology and Metabolism. 2011; 15(2): 78-81.

5. Bamanikar. Clinical Cancer Investigation Journal (Internet) 2014;3(03);208-212.
6. Sukumaran R, Kattoor J, Pillai K R, Ramdas P J, Nayak N, Somanathan T, et al. Fine Needle Aspiration Cytology of Thyroid Lesions and its Correlation with Histopathology in a series of 248 patients. Indian J Surg Oncol. 2014 Sep;5(3):237- 41.
7. Zulfikar A, Ritica C, Umaroo N. Study of Prevalence of Thyroid Lesions in Coastal Regions of Karnataka Journal of Evolution of Medical and Dental Sciences 2013;2:6995-7002.
8. Ambika Gopalakrishnan, Unnikrishnan, Usha VM Thyroid disorders in India: An epidemiological perspective Indian Journal of Endocrinology and Metabolism 2011;15:78-81.
9. Mackenzie EJ, Mortimer RH. 6: Thyroid nodules and thyroid cancer. Med J Aust 2004; 180:242-7.
10. Bouq Y, Fazili FM and Gaffar HA. A current pattern of surgically treated thyroid diseases in the Medinah region of Saudi Arabia. JK-Practitioner 2006; 13:9-14
11. Abdulla H Darwish, Khalid A Al-Sindi, Jihene El Kafsi, BAcantab. Pattern of Thyroid Diseases – A Histopathological Study Bahrain Medical Bulletin 2006;28.
12. Krukowski ZH. The thyroid gland and thyroglossal tract. In: Williams NS, Bulstrode CJK, O'Connell PR, eds. Baily and Love's short practice of surgery. 24th ed. London. Hodder education. 2004:776-804.
13. Ashwini K, Anitha B, Letha P, Trupti Joshi, Jayasree, Samith Ahmed, Harish Naik. Pattern of thyroid disorder in thyroidectomy specimen Int. J. Med. Sci., Public Health. 2014; 3:1446-1448
14. Gupta A, Jaipal D, Kulhari S, Gupta N. Histopathological study of thyroid lesions and correlation with ultrasonography and thyroid profile in western zone of Rajasthan, India. Int J Res Med Sci. 2016; 4:1204-1208
15. Salama SI, Abdullah LS, Al-Qahtani MH, Al-Maghrabi JA. Histopathological pattern of thyroid lesions in western region of Saudi Arabia. New Egyptian JMedicine 2009; 40:580-5.
16. Fahim A, Qureshi A, Alvi H, Azmi MA. Clinical Presentation and Evaluation of Histopathological Patterns of Hospital-based Frequency of Thyroidectomic Biopsies. Medical Forum 2012;9: 1-6.
17. Mandal S, Barman D, Mukherjee A, Mukherjee D et al. Fine needle aspiration cytology of thyroid nodules-evaluation of its role in diagnosis and management. J Indian Med Assoc. 2011; 109:258-61.
18. Singh P, Chopra R, Calton N, Kapoor R. Diagnostic Accuracy of Fine Needle Aspiration Cytology of Thyroid lesions. Journal of Cytology. 2000; 17:135-9.
19. Veyseller B, Aksoy F, Demirhan H, et al. Total thyroidectomy in benign thyroid diseases. Kulak Burun Bogaz Ihtis Derg, 2009;19, 299-303.
20. Islam R, Ekramuddaula AFM, Alam MS, Kabir MS et al. Frequency and pattern of malignancy in solitary thyroid nodule. Bangladesh J of Otorhinolaryngology. 2009; 15:1-5.
21. Abdulkader Albasri, Zeinab Sawaf, Akbar Shah Hussainy, Ahmed Alhujaily Histopathological Patterns of Thyroid Disease in Al-Madinah Region of Saudi Arabia. Asian Pac J. Cancer. Prev., 15:5565-5570.
22. Chukudebelu O, Dias A, Timon C. Changing trends in thyroidectomy. Ir Med J 2012; 105:167-9.
23. Yang L, Sun TT, Yuan YN and Wang N. Time trends and pathological characteristics of thyroid cancer in urban Beijing, 1995-2010. Zhonghua Yu Fang Yi Xue Za Zhi 2013; 47:109-12.
24. Yildiz SY, Berkem H, Yuksel BC et al. The rising trend of papillary carcinoma

- in thyroidectomies: 14-years of experience in a referral center of Turkey. *World J. Surg. Oncol*, 2014;12:34.
25. Amphlett B, Lawson Z, Abdulrahman GO Jr, et al. Recent trends in the incidence, geographical distribution, and survival from thyroid cancer in Wales, 1985-2010. *Thyroid*, 2013;23:1470-8.
26. Ariyibi OO, Duduyemi BM, Akang EE, Oluwasola AO. Histopathological patterns of thyroid neoplasms in ibadan nigeria: a twenty-year retrospective study. *Int J Trop Disease Health* 2013; 3:148-56.