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RESEARCH ARTICLE

HISTOPATHOLOGICAL PATTERN OF THYROID LESIONS REPORTED IN A TERTIARY CARE HOSPITAL IN KASHMIR: A 3-YEAR RETROSPECTIVE REVIEW

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ABSTRACT

The present study was carried out in the postgraduate department of Pathology at Government Medical College, Srinagar, India, to study the histopathological pattern of thyroid lesions reported a tertiary care hospital in Kashmir retrospectively for a period of three years. During this study, 165 thyroidectomy specimens were analyzed. Their corresponding slides were retrieved and reviewed. Out of these, 37 cases were non-neoplastic and 128 were neoplastic. Among neoplastic cases 40 cases were benign, 87 cases were malignant and one case was diagnosed as having a well differentiated tumor of uncertain malignant potential. Peak incidence was in the third decade of life with female predominance. Among the malignant tumors, the highest incidence was that of papillary carcinoma of thyroid (83.90%), followed by follicular and medullary carcinoma (6.89% each). Colloid goitre (12.72%) was the most frequent entity in the benign category. The remarkable observation of this study was that the neoplastic lesions predominated over non-neoplastic lesions and among neoplastic lesions malignant cases outnumbered benign ones which is in contrast to most of the previous studies from other parts of the globe.

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INTRODUCTION

Diseases of thyroid gland are among the most common endocrine disorders affecting the population worldwide. Lesions of thyroid gland can present as a wide spectrum with colloid goitre at one end and bizarre anaplastic tumors on the other. The incidence of thyroid diseases varies from one geographical area to another. They are endemic in mountainous regions of the world where the soil, water and food supply contain little iodine. In India, there is a significant burden of thyroid diseases. According to a projection from various studies on thyroid disease, it has been estimated that about 42 million people in India are suffering from thyroid diseases (Ambika, 2011). Thyroid cancer is a relatively rare malignancy representing only 1.5% of all cancers but it is the commonest endocrine cancer accounting for 92% of all endocrine malignancies (Niazi S, 2007). The Himalayan belt is one of the most severe endemic areas for iodine deficiency diseases (Bamzai, 1973).

The first study conducted on iodine deficiency in Kashmir Valley reported an overall prevalence of goiter to be 45.2% (Zargar, 1995). Recent studies carried out in Srinagar and adjoining areas have reported total goiter prevalence rate of 5.57% in boys and 6.85% in girls (Rafiq M 2006). The thyroid diseases present clinically either as conditions associated with hyperthyroidism/hypothyroidism or as mass lesions (Maitra A, 2004). Surgical excision and histopathological evaluation are crucial to establish the diagnosis in the latter scenario. There is no data regarding the histopathological patterns of thyroid lesions in Kashmir region. The aim of the study was to present the histopathological pattern of thyroid gland lesions as seen in the department of pathology, Government Medical College Srinagar. This is a referral centre for most hospitals in adjoining districts of Srinagar. This study also analyses the demographic profile (age and sex data) associated with various types of non-neoplastic and neoplastic conditions. The objective of this study was to determine the spectrum of histopathological diagnoses encountered in patients undergoing thyroid surgeries.

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## MATERIALS AND METHODS

This study was done in the Postgraduate department of Pathology, Government Medical College, Srinagar and its associated hospitals over a period of three years from August 1<sup>st</sup> 2012 to July 31<sup>st</sup> 2015. Government Medical College Srinagar with its associated hospitals is a tertiary health care centre. Srinagar being the summer capital of Jammu and Kashmir State, takes care of most of the population of Kashmir region including the parts of Ladakh. The material for this study consisted of thyroidectomy specimens including lobectomy, partial thyroidectomy, subtotal thyroidectomy and total thyroidectomy.

The decision to operate on the patients was based on clinical, radiologic, cytological and other laboratory investigations. Patients had a blind or ultrasound guided fine needle aspiration and ultrasonographic scans before their surgery. For each case, the laboratory request form and duplicate copy of the histological report were retrieved and relevant clinical information such as age, sex and the histological type of thyroid disease was noted. The corresponding wax blocks and slides were retrieved from the archives and reviewed by the study pathologists. Diagnosis was reconfirmed by histopathological examination. During the course of re-examination of slides, diagnoses of three cases were changed after consultation with three senior consultants. These included two cases of follicular variant of papillary carcinoma and one case of well differentiated tumor of uncertain malignant potential that were earlier diagnosed as follicular adenoma. The thyroid diseases were classified on histological grounds into non-neoplastic and neoplastic lesions that were further classified as benign and malignant as per the WHO histological classification of thyroid tumours<sup>7</sup>. The data was subsequently analyzed and presented in a tabulated form.

## RESULTS

A total of 165 thyroid specimens were received over a period of three years, representing 1.1% of all the cases seen at the pathology department of Government Medical College, Srinagar. There were 129 (78.18%) females and 36 (21.81%) males giving a female: male ratio of 3.5:1. The age of the studied cases ranged from 9 years to 70 years with a mean age 37.81 years and the relative peak age of incidence was seen in 30-39 years age group (29.69%). The young age group ( $\leq 20$  years) and the elderly age group above 60 years constituted 7.27% and 7.87% of cases respectively (Table 1).

**Table 1. Age and gender distribution as per age group (n=165)**

Age group	GENDER (%)	
	M (%)	F (%)
0-9	-	1 (100)
10-19	1 (12.50)	7 (87.50)
20-29	6 (16.21)	31 (83.70)
30-39	12 (24.48)	37 (75.51)
40-49	12 (32.43)	25 (67.56)
50-59	4 (20.00)	16 (80.00)
60-69	1 (10.00)	9 (90.00)
70-79	-	3 (100)
TOTAL	36 (21.81)	129 (78.18)

In contrast to most of the previous studies, neoplastic lesions outnumbered the non-neoplastic lesions. In this study, non-neoplastic lesions were less common, found in 21.21% (n=35) cases. (Table 2). Thyroglossal duct cysts were the only congenital thyroid gland anomaly seen in this study and accounted for 1.21% of cases. There was a slight male preponderance. The average age of presentation of thyroglossal duct cyst was 17 years. Among non-neoplastic thyroid lesions, colloid goiter was most common pathologic entity, constituting 60 % (n=21) of all non-neoplastic cases studied and having a female to male ratio of 4.2:1 and a mean age of 35 years. Most of them were multinodular. Adenomatoid nodule was second most common non-neoplastic lesion comprising 22.85% (n=8) cases and was followed by thyroiditis, seen in 17.14% (n=6) cases.

In this study one patient of 35 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. In our study, neoplastic lesions were seen in 76.36% (n=126) cases comprising mostly of carcinomas (Table 3, 4). The benign thyroid neoplasms consisted of follicular adenomas and Hürthle cell adenomas accounting for 18.18% (n=30) and 6.06% (n=10) respectively of all thyroid lesions. The peak age of benign thyroid neoplasms was from 30-49 years with female to male ratio of 4:1. Malignant thyroid lesions accounted for 52.72% (n=87) of all the thyroid lesions and 69.04% of all neoplastic lesions. The female male ratio for malignant thyroid lesion was 3.7:1. Papillary carcinoma was the commonest malignant tumor in this study seen in 83.90% (n=73) of all malignant lesions and 44.24% of all the thyroid lesions (Table 5). Of these cases, 14 (19.18%) were males and 59 (80.82%) were females with a female: male ratio 4.2:1.

Most of the patients (n=23; 29.48%) were between 30-39 years of age. 35 cases (47.94%) were of classical variant, 4 cases (5.47%) were papillary microcarcinomas, 1 case was tall cell variant (1.36%), while the rest 33 (45.20%) were follicular variant. Six cases each of follicular carcinoma and medullary carcinoma were encountered in this study, comprising of 13.78% of all malignant neoplasms (Table 5). Two cases were diagnosed as Well-differentiated carcinoma, NOS (not otherwise specified) and comprised 2.29% of all thyroid lesions.

## DISCUSSION

Diseases of the thyroid are of great importance because most are amenable to medical or surgical management. According to WHO, 7% of the world population is suffering from clinically apparent goitre, and majority of them are from developing countries, where the disease is attributed to iodine deficiency (Bukhari U, 2008). Both the neoplastic and non-neoplastic diseases of thyroid are common all over the world, with varying frequency and incidences (Vanderpump MP, 2011). India is no exception and it has been projected that about 42 million people suffer from thyroid diseases in the country (Ambika, 2011). The national goitre control programme in India has shown that India has world's highest goitre belt in the Himalayan and sub Himalayan region with the prevalence of 29% (WHO, 1067).

**Table 2. Histopathological distribution of thyroid lesions (n=165)**

Lesion		Male	Female	Total	Percentage
Congenital	Thyroglossal duct cyst	2	0	2	1.21
Non neoplastic	Colloid goitre	4	17	21	12.72
	Adenomatoid nodule	2	6	8	4.84
Benign neoplasm	Thyroiditis	2	4	6	3.63
	Follicular adenoma	6	24	30	18.18
	Hürthle cell adenoma	2	8	10	6.06
WDT-UMP*		0	1	1	0.60
Malignant neoplasm	Papillary carcinoma	14	59	73	44.24
	Follicular carcinoma	2	4	6	3.63
	Medullary carcinoma	2	4	6	3.63
	Well differentiated Ca-NOS	0	2	2	1.21
TOTAL		36 (20.60%)	129 (79.39%)	165	100

\*well differentiated Carcinoms of uncertain malignant potential

Thyroidectomy, presently, has become a routine procedure as a result of safe anesthesia, antiseptics, fine surgical instruments, developments of newer techniques and is offering the chances of cure to many patients with thyroid diseases (Bouq Y, 2006). In this study thyroidectomy specimens constituted 1.1% of the surgical pathology specimens in the department of pathology, Government Medical college Srinagar. This is comparable to the study done by Abdulla *et al.* (2006) who found that thyroid specimens constituted 1.5% of all histopathology specimens.

**Table 3. Age and sex distribution of patients with neoplastic thyroid lesions(n=126)**

Age group	ADENOMAS		WDT-UMP		CARCINOMAS	
	M	F	M	F	M	F
0-9		1				
10-19		2			1	4
20-29	2	8			3	18
30-39	3	8		1	4	20
40-49	3	8			6	10
50-59		1			3	9
60-69		4			1	4
70-79						2
TOTAL	8	32		1	18	67

**Table 4. Gender distribution as per the tumor nature (n=126)**

Tumor Type	Gender		Total (%)
	Male (%)	Female (%)	
Benign	8 (20.00)	32 (80.00)	40 (31.74)
WDT-UMP*	-	1(100)	1(0.79)
Malignant	18 (21.17)	67 (78.82)	85 (67.46)
Total	26 (20.63)	100 (79.36)	126 (100)

\*well differentiated tumor of uncertain malignant potential

**Table 5. Histopathological types of thyroid cancers (n=87)**

Histopathological diagnosis	Number of cases	Percentage
Papillary carcinoma	73	83.90
Follicular carcinoma	6	6.89
Medullary carcinoma	6	6.89
Well differentiated Carcinoma-NOS	2	2.29

Thyroid diseases have historically been known to affect the female sex preferentially. In our study, there were similar results with 78.18% of patients being females and 21.8% being males, giving the female: male ratio of 3.5:1.

These findings are in concordance with the studies done by Ashwini *et al.* (2014), Rahman *et al.* (2013), Fahim *et al.* (2012), Mirzakarimov *et al.* (2012), Chukudebelu *et al.* (2012), and Veyseller *et al.* (2009). The age range of patients in our study ranged from 9 years to 70 years with the mean age of 37 years which is in accordance with the study of Chukudebelu *et al.* (2012) who reported the age range of patients from 4-87 years and the mean age was 51 years. Similar results were also obtained by Fahim *et al.* (2012), Veyseller *et al.* (2009) and Misiakos *et al.* (2006). The peak age of incidence in our study was 30-39 years age group which is in accordance with the study of Abdulkader *et al.* (2014) who found 31-40 years age group as the peak age for thyroid diseases.

In contrast to most of the studies worldwide, neoplastic lesions outnumbered the non-neoplastic diseases in this study. Our findings regarding this were in contrary to the findings of Ashwini *et al.* (2014), Rahman *et al.* (2013), Chukudebelu *et al.* (2012), Fahim *et al.* (2012), and Mirzakarimov *et al.* (2012). Within the group of non-neoplastic lesion in the thyroid specimens, there is a consensus in all the remote and recent studies, that colloid goiter is the commonest lesion and so are the findings in our study. A study in India by Ashwini *et al.* (2014) found 64.8% of cases having multinodular goitre. A group working in an endemic area of Greece, Misiakos *et al.* (2006), reported 54.9% nodular goitre in their 264 cases of total thyroidectomies specimens. From Zambia, Mirzakarimov *et al.* (2012), in their 239 thyroid specimens found 172 cases (71.96%) of colloid goiter. From Bangladesh, Rahman *et al.* (2013), found colloid goiter in 92.05% of all non-neoplastic diagnosis in 108 thyroidectomy specimens. Similarly, researchers from Pakistan (Fahim *et al.*, 2012), Khanzada *et al.* (2011) and Hussain *et al.* (2005) reported colloid goitre as the commonest in their experiences.

Among other non neoplastic lesions, thyroiditis was seen in about 3.63 % of cases. Misiakos *et al.* (2006), from Greece reported thyroiditis in 3.8% cases. From Zambia, 1.2% thyroiditis cases were reported by Mirzakarimov *et al.* (2012). Similarly Rahman *et al.* (2013), from Bangladesh, found only 2.77% of thyroiditis patients in their 108 case series. Hussain *et al.* (2005), from Pakistan in their total 662 cases, found 26 cases of thyroiditis (lymphocytic thyroiditis was seen in 22 cases (3.32%) and Hashimoto's thyroiditis in 4 cases (0.06%).

Within the neoplastic lesions, malignant lesions predominated over benign adenomata in our study. Our findings in this regard are similar to the study of [Abdulkader et al. \(2014\)](#), from Saudi Arabia who reported 81 neoplastic cases, among which 88.8% were malignant and rest were benign.

In our study, papillary carcinoma was the most common malignant thyroid lesion and constituted 83.90 % of the malignant lesions. This observation was in accordance with the study of [Abdulkader et al. \(2014\)](#) in Saudi Arabia who found papillary carcinoma as the most common malignant lesion among the malignant thyroid tumors. Our finding regarding increased trend of papillary carcinoma diagnosis among malignant thyroid tumors is also consistent with that of [Yang et al. \(2013\)](#), from Beijing. Similarly in a recent study from Turkey, [Yildiz et al. \(2014\)](#), reported a significant increase in the frequency of papillary and micropapillary carcinomas.

### Conclusion

Two important observations have emerged from this study. One is that the neoplastic lesions predominate over non-neoplastic lesions and other is that the malignant lesions are outnumbering benign ones and major contributor being papillary carcinoma of thyroid. Only few studies have demonstrated somewhat similar trends.

We consider following possible reasons for former observation.

- That preoperative selection of patients for surgery in our institute has been more specific for neoplastic lesions as diagnosed by FNAC in combination with other investigations like USG etc. thus selecting only those patients for surgery with preoperative diagnosis favoring neoplasia.
- Patients with non-neoplastic diagnosis were subjected to surgery only under few specific conditions like relief from local obstructive symptoms, control of thyrotoxicosis or for cosmetic reasons, thus leading to decreased number of non-neoplastic cases being diagnosed on histopathological examination.

As regards to the finding that there are more malignant lesions than benign ones in our study, we strongly consider this observation as significant and alarming. As of now, we don't have any apparent reason to explain such predominance of malignant lesions over benign ones. But at the same time, we recommend more studies regarding this and with larger number of cases, which we intend to carry out in future.

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