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Spectrum of Thyroid Diseases at Benue State University Teaching Hospital Makurdi, Nigeria: A Histopathological Survey.

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ABSTRACT

Thyroid diseases are significant endocrine disorders with a wide spectrum of histological patterns and marked geographical variation. This study aimed to evaluate the histopathological spectrum of thyroid lesions in Makurdi, North Central Nigeria, over a 10-year period. A retrospective review of 121 thyroidectomy specimens received at the Benue State University Teaching Hospital, Makurdi, between January 2015 and December 2024 was conducted. Histopathological diagnoses were classified into non-neoplastic, neoplastic, and inflammatory lesions. The study revealed that females accounted for 91% of cases, yielding a female-to-male ratio of 10:1. The most affected age group was 31–40 years. Non-neoplastic lesions predominated (87.2%), with multinodular goitre constituting 82% of all cases. Neoplastic lesions accounted for 12.8%, comprising 5% benign and 7.4% malignant cases. Papillary carcinoma was the most frequent malignancy (56%), followed by poorly differentiated carcinoma (22%), with follicular and medullary carcinomas representing 11% each. Inflammatory conditions, including Hashimoto thyroiditis and Graves' disease, were rare. Thyroid lesions in Makurdi are predominantly non-neoplastic, with a striking female preponderance. Multinodular goitre remains the most common lesion, while papillary carcinoma is the leading thyroid malignancy. Further studies are warranted to investigate regional variations in thyroid cancer incidence.

Keywords: Thyroid Disorders, Hyperthyroidism, Hypothyroidism, Goitres, Thyroiditis, Neoplasms.

INTRODUCTION

The thyroid gland is a butterfly-shaped vital endocrine gland located at the front of the neck and within the investing fascia of the neck. It is a part of the endocrine system controlling many of the body's important metabolic functions by producing and releasing thyroid hormones. The thyroid gland responds to many stimuli and is in a constant state of adaptation to it's diseases as manifested by alterations in hormone secretion or enlargement of the gland or both[1]. Diseases of the thyroid are of great importance because most are amenable to medical or surgical management[2]. They are

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common endocrine disorders encountered in the African continent[3] and are the second most common endocrine disorders in Nigeria[4].

It has also been widely established that the pattern of thyroid diseases is subject to geographical variations as well as etiological and predisposing factors inherent in such locales[3,4,5,6]. Work done on thyroid diseases in southern Nigeria shows non-neoplastic disorders constituting 68.45% and neoplastic disorders, 31.6% of thyroid diseases in the study[5]. A histopathological study in Ghana identified non-toxic multinodular goiter as the most common thyroid disorders especially among females[7]. This contrast the south western Nigeria study[5] that identified simple colloid goiter has the commonest non-neoplastic pathology and both correlates with the Zaria[8] and Ile-Ife[9] studies which shows colloid goiter as the most common thyroid diseases encountered[8,9]. Abebe and Osman[10] and Tsegaye and Ergete[11] both from Ethiopia reported frequencies of 80% and 76.9% respectively for colloid goiter in their Ethiopia studies.

Iodine deficiency has been identified as a significant public health problem in 129 countries and at least one third of the world's population live in areas of iodine deficiency[12] and Nigeria is one of such countries. The pattern of thyroid disorders in Africa is evolving and with the paucity of known study on its pattern in Makurdi, Nigeria, this studies seeks to document the histopathological pattern of thyroid diseases in our environment to compare and contrast our findings with similar works in other parts of Nigeria and globally.

MATERIALS AND METHODS

This was a retrospective review of medical records of all patients with thyroid disorders seen in the Benue State University Teaching Hospital, Makurdi, Nigerian over a 10 year period from January 1st 2015 to December 31st 2024.

All the surgical biopsy specimens were formalin fixed and paraffin embedded section and stained using heamatoxyln and eosin. The data retrieved included clinical data, results, the duplicate copy of the histological reports slides and blocks were kept in the departmental archives. All sections were diagnosed and reported by the pathologists. Information collected included patient's age, sex and histopathological diagnosis. The slides were not retrieved for review. All the lesions were broadly classified into goitres, inflammatory and neoplasms. Descriptive statistical analysis was done using SPSS version 27.0 by IBM Corporation, USA to determine frequencies and percentages as well age range and standard deviation (SD) of age. The data were presented in frequency tables and charts

RESULTS

A total of 121 cases of thyroid specimens were received during the study period constituting 1.6% of the total 7562 of histological specimens received during the study period. Nine point one percent (9.1%) were specimens from male patients while 90.9% were from female patients, giving a male-to-female ratio of 1:10 of thyroid lesions among the study population (table and figures 1 and 2). Majority of the patients with thyroid lesions were within the age range of 31-40 years. Multinodular goiter represented the preponderant disorder in both sexes with 100 (82%) cases and colloid goiter was seen in 1 (0.8%) of total cases in this study (Tables 2 and 3 and figure 3)

Neoplasms constituted the second group of common lesions seen in this study. Benign neoplasms, predominantly follicular adenoma represent 5.0% (6) of total cases, and malignant, 7.4% (9) total lesions studied respectively (Table 2 and figures 3 and 4). The adenomas were predominantly seen in 83% of the females, and 17% in males given a male to female ratio of 1:5. Eighty-nine percent (89%) of the carcinoma were seen in females and only 11% in males with

bimodal peak incidence at age range 21-30 years and 31-40 year (Table 4). Papillary carcinoma was seen in 56% of all malignant thyroid carcinoma cases, poorly differentiated variant in 22% of cases, follicular carcinoma and medullary carcinoma in 11% of cases each. The medullary carcinoma (11%) was the only malignancy found in males (Table 5 and figure 3).

There was 0.8% (1) case of inflammatory diseases (Hashimoto thyroiditis) found for all the submitted thyroid specimens, 2 (1.7%) of cases

Table 1: Age and sex distribution of patients with thyroid diseases

Age group (years)	Sex		Total	Percentage
	Male	Female		
1-10	-	2	2	**1.6%**
11-20	-	3	3	**2.4%**
21-30	-	17	17	**14%**
31-40	3	33	36	**30%**
41-50	5	22	27	**22%**
51-60	-	26	26	**21.4%**
61-70	3	5	8	**7%**
71-80	-	2	2	**2%**
Total	**11(9.1%)**	**110 (90.9%)**	**121(100%)**	**100%**

Table 2: Distribution of Histological Types of Thyroid Disease

Histological classification	Sex		Total	Percentage
	Male	Female		
Goiters				
Multinodular	8	92	100	**82. 6%**
Colloid	-	1	1	**0.8%**
Inflammatory diseases				
Hashimoto thyroiditis	-	1	1	**0.8%**
Graves diseases	-	2	2	**1.7%**
Thyroglossal cyst	-	2	2	**1.7%**
Neoplastic diseases				
Benign adenoma	2	4	6	**5.0%**
Malignant	1	8	9	**7.4**
Total	**11**	**110**	**121**	**100%**

Table 3: Age and Sex Distribution of patient with goitre

Age group	Sex		Total	Percentage
(years)	Male	Female		
11-20	-	2	2	**1.98%**
21-30	-	13	13	**12.9%**
31-40	3	29	32	**32.7%**
41-50	4	18	22	**21.78%**
51-60	-	25	25	**24.75%**
61-70	3	3	6	**5.94%**
71-80	-	1	1	**0.99%**
Total	**10**	**91**	**101**	**100%**

Table 4: Age and Sex Distribution of patients with thyroid carcinoma

Age group	Sex			Percentage
years	Male	Female	Total	
11-20	-	1(11%)	1	**11%**
21-30	-	2(22)	2	**22%**
31-40	-	2(22)	2	**22%**
41-50	1(11%)	1(11%)	2	**22%**
51-60	-	1 (11%)	1	**11%**
61-70	-	1(11%)	1	**11%**
71-80	-	-	-	**0%**
Total	**1(11%)**	**8(89%)**	**9**	**100%**

Table 5: Sex and Histological Types of Thyroid Carcinoma

Histopathological type	Sex		Total	Percentage
	Male	Female		
Papillary carcinoma	-	5(56%)	5	**56%**
Follicular carcinoma	-	1(11%)	1	**11%**
Medullary carcinoma	1(11%)	-	1	**11%**
Poorly differentiated	-	2(22%)	2	**22%**
Carcinoma				
Total	**1(1%)**	**8(89%)**	**9**	**100%**

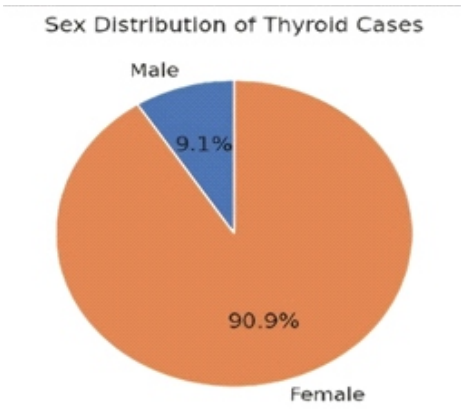

Figure 1

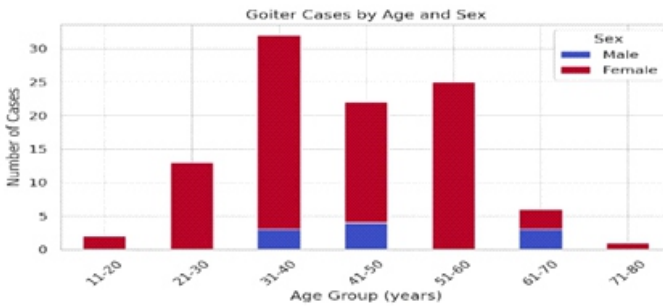

Figure 2

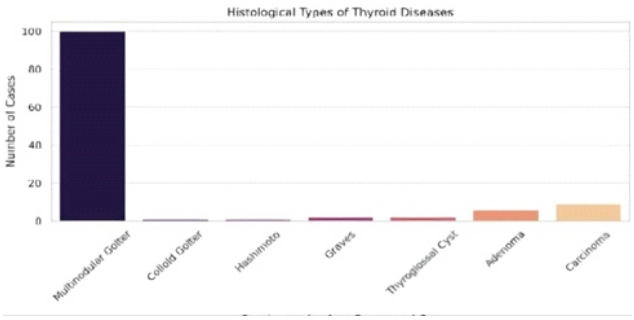

Figure 3

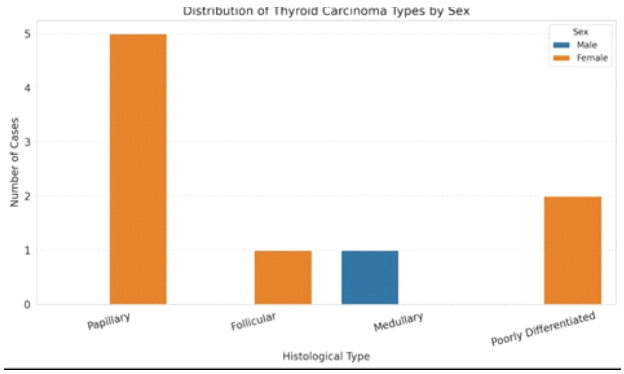

Figure 4

DISCUSSION

Thyroid gland specimens constituted only 1.6% of the surgical pathology load in our centre during the study period. This is comparable to findings in other centres in Nigeria and in some international series[13,14,15].

Thyroid diseases essentially affected women with a remarkable female preponderance reported for all thyroid lesions [4,16,17]. This study found a male to female ratio of 1:10 which compares favorably with 1:10, 1:3, 1:7 found in Ibadan[5], Ethiopia[18], and Lagos [19] respectively.

Non-neoplastic lesions accounted for the majority of thyroid lesions found in this study (87.2%). This compare favorably with other studies within Nigeria [4,16,17,20]. This finding is also in consonance with work done in Ethiopia (85%)[18] and USA (84.1%)[21].

The majority of patients had goitre with multinodular goiter constituting 82% of all thyroid lesions seen and colloid goiter, 0.8% giving a total of 82.8% of all thyroid lesions in the study. Similar pattern of goitre preponderance was also observed in Kano (68%)[16], Enugu (63.2%)[17], Port-Harcourt (73%)[20] and Ethiopia (85%)[18]. Goiter occurred in 93% of female patients and this is similar to findings in Lagos (79%)[9] and Ile-Ife19 (68.6%)[19]. The peak age incidence of occurrence for goitre is 31-40-year age range. This is significant in females because of the higher demand for iodine for physiological needs in this age group[8]. A deficient intake of iodine is the dominant cause of the disease with the degree of thyroid enlargement being proportional to the level of and duration of disease. Multinodular goitre is the most common goitre and it is formed from recurrent episodes of stimulation and involution of diffuse goitres and can produce extreme thyroid enlargement[2]. They occur due to variation in follicular

cells in response to thyroid hormonal stimulation.

Neoplasm of the thyroid gland accounted for the second (12.8%) most common histopathological diseases in this study. This is in agreement with similar studies in Nigeria and elsewhere in Africa [4,11]. Our rate of 12.8% is similar to that of Abuja (11%)[22], and Ilorin (15%)[4]. This is in contrast to 31.6% found in southern Nigeria[5] which concurred with the Ethiopia[11] and Kenya[23] rates of 21% and 43% respectively. The difference may be partly explained by the differences in indication for the thyroidectomy in the studied population groups i.e. medical or socio--economic reason[23]. Thyroid adenoma accounted for 5.4% of the case of benign neoplasm in the study. This rate compared with the Abuja study of 8%[22]. Our rate is in contrast to other studies from Nigeria[17], Africa[11,19,] and USA[21]. This variation in rate has been attributed to differences in the relative frequencies of simple goiter in such areas[19]. Thyroid malignancy was the histological type in 7.4% of all thyroid specimens received in this study. This was similar to 7% reported in Ilorin[4] and Lagos[19] who reported 7% and 8.1% respectively but lower than 10.9% -14.1% in some Nigeria series[9,16,17,20]. Our rate was higher than the 3% reported from Abuja[22]. There is a need to do further studies to explain this disparity with Abuja figure since Makurdi and Abuja are in the same north central, middle belt zone of Nigeria.

The predominant histopathological type of thyroid carcinoma in this study was papillary carcinoma (56%). This is similar to other Nigeria and international series [17,20,11,24,25,26,27]. Papillary carcinoma represented 4.1% of the entire thyroid specimens. This finding of 56% agrees with reports from other centers in Nigeria whom have reported 70.5%, 56.5%, and 54.5% from Zaria[27], Enugu[20] and Port-Harcourt respectively[17]. Papillary carcinoma of the thyroid is most common histological type of primary malignant thyroid tumor worldwide[28], and it is seen commonly in iodine deficient regions. Poorly differentiated carcinoma accounted for the second most common thyroid malignancy with 2 cases (22%) among the thyroid malignancies seen in the study. This is in contrast to most studies in Nigeria and Kenya that reported follicular carcinoma as the second most common thyroid malignancy [5,9,16,28]. Medullary and follicular carcinomas were seen in only 1 case (each) occurring in a male and female respectively.

CONCLUSION

This study has shown that thyroid diseases are not uncommon in this environment and occur predominantly in women. The predominant histological lesson is multinodular goiter. The conclusion regarding the incidence of thyroid malignancy needs further study because of the limited cases.

Ethical Approval:

Institutional ethical clearance was obtained for the use of anonymised registry data.

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Conflict of interest and disclosures: there are no conflicts of interest

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