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Spectrum of Thyroid Diseases in Makurdi, Benue State of Nigeria: A Review of 94 Consecutive Cases

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Authors' contributions

This work was carried out in collaboration between all authors. Authors BAE and BAO designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors AA and ME managed the analyses of the study. Author PA managed the literature searches. All authors read and approved the final manuscript.

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Short Communication

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ABSTRACT

This study aims to review the spectrum of thyroid diseases in Makurdi, Benue State of Nigeria through a histopathological survey. It is a retrospective study covering 1st January, 2005 to 31st December, 2016.

Ninety four (94) consecutive cases of thyroidectomy specimens collected from Holy Trinity Specialist Hospital, Makurdi, Nigeria a private hospital and Benue State University Teaching Hospital, Makurdi, Nigeria between January 1st, 2005 to December 31st, 2016 were examined histologically and analyzed with regards to age and sex.

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There were 7 male specimens as against 87 female specimens giving a male: female ratio of 1:12.43. Nodular colloid goiter was the commonest histological lesion accounting for 72%, followed by thyroid carcinoma which accounted for 11.66%, adenoma 10.60%. Thyroiditis, 5.30% was the fourth commonest pathology and thyroglossal cyst/duct accounted for 1.06%. Follicular carcinoma was the commonest malignancy seen accounting for 7.51% of all specimens and most occurred in females. However, most of these thyroid malignancies occurred in younger age groups (20-49years) compared to other studies in Nigeria and Africa. There is need for a large scale study in Makurdi on the relatively younger age of our thyroid malignancies, higher incidence of follicular carcinoma when compared to other African studies and the relatively high incident of thyroiditis found in this study.

Keywords: Spectrum; thyroid diseases; Makurdi.

1. INTRODUCTION

Thyroid diseases manifest as enlarged thyroid glands (goiters) or alterations in its hormonal levels or both [1]. The normal thyroid gland weighs 7-25 g in the African and 15-25 g in the Caucasian (2). For the gland to be palpable it must be at least 40 g [2]. The thyroid gland produces and releases into the circulation at least two potent hormones, thyroxine (T4) and triidothyronine (T3), that influence basal metabolic processes or enhance oxygen consumption in nearly all body tissues [3]. Thyroid hormones also influence linear growth, brain function, including intelligence and memory, neural development, and bone development [3].

A goiter is a great source of embarrassment to its sufferer because of the social stigma, in addition to other symptoms that it might cause in the patient. Thyroid diseases are common endocrine disorders encountered in the African continent [4]. They are the second most common endocrine disorders in Nigeria [5].

A histopathological study of thyroid diseases in southern Nigeria shows non-neoplastic disorders constituting 68.45% and neoplastic disorders 31.6% of thyroid diseases in southern Nigeria [6]. A recent study from Port Harcourt, in Nigeria shows that colloid goiter is the commonest lesion encountered accounting for 21.3% of the patients with thyroid pathology [7]. Work done in Ghana showed non toxic multi nodular goiter as the commonest thyroid disorder especially among females [8]. This is in contrast to south western Nigeria work that identified simple colloid goiter as the commonest non-neoplastic pathology [6].

Report on thyroid malignancies in Africa abound and differentiated thyroid malignancies are noted to occur more commonly than other forms of thyroid malignancies [4]. The documented prevalence rates of thyroid carcinoma in the African continent are as follows: Papillary, 6.7-72.1%, follicular 5.9-68%, anaplastic 5-21.4% and medullary 2.6-13.8% [4]. For the differentiated thyroid carcinoma, there is a changing trend toward the more frequent occurrence of papillary carcinoma and this may be attributable to widespread ionization programs [4]. A 2004 study by Hill Ag, Mwangi I and Wagana L [9] in a rural Kenya hospital shows the commonest pathological diagnosis was multinodular goiter (47%), Grave's disease (13%) and malignancy (11.7%). Thyroid follicular carcinoma constituted 10 and papillary thyroid carcinoma, 15 of the 25 cases of malignant thyroid disorders seen. Others have discovered follicular carcinoma to be the commonest [6,9].

While a study by Edino ST and Mohammed AZ, in Kano Nigeria revealed that out of the 25 cases of carcinoma detected, well differentiated follicular carcinoma was the predominant histological type in 13 (52%) cases, followed by papillary in 10 (40%), medullary carcinoma in 1 (4%) and anaplastic carcinoma in 1 (4%) patient [10].

No similar study has been carried out in Benue State of Nigeria on Thyroid pathology, a state with a population of about four million people, situated in the north central zone of the country and a referral centre for about five other states. This study will help in giving insight into thyroid pathology in Benue State, Nigeria based on its histopathological diagnosis and their relationship to age and sex.

2. MATERIALS AND METHODS

A retrospective review of histopathological results was carried out on thyroidectomy specimens done at the Benue State University Teaching Hospital Makurdi and Holy Trinity Specialist Hospital, Makurdi, a private hospital that sees most of the goiter cases in Benue State. The pre-operative diagnoses of the patients were simple goiters in 90 patients and toxic goiters in 4

patients. Patients with simple goiters were diagnosed on clinical grounds. Thyroid function tests were not done for financial reasons since the patients could not afford the high cost of the investigation. Only the 4 patients with clinically diagnosed toxic goiter had thyroid functions tests done on them and were rendered euthyroid by antithyroid drugs before surgery. The specimens were that of subtotal thyroidectomies in the 90 patients that were clinically euthyroid and near total thyroidectomy specimens in the 4 patients that were rendered euthyroid. The study covers the year January 1st 2005-December 31st 2016. Information collected included patient's age, sex and histopathological diagnosis. All the lesions were broadly classified into nodular colloid goiter including colloid and adenomatous goiter, adenoma (both follicular and hurtle cell type), all types of thyroiditis and carcinoma including all subtypes –follicular, papillary, medullary and anaplastic type and thyroglossal duct/cyst. The data was analyzed using simple statistical methods like means, percentages and ranges.

3. RESULTS

A total of 94 cases were reviewed during the period of study. Seven (7.42%) were specimens from male patients and 87 (92.58%) were from female patients) giving a male to female ratio of 1:12.43 of thyroid lesions among the population studied. Nodular colloid goiter (NCG) was the commonest thyroid disease in both sexes, which was seen in 67(72%) of the total cases. These are predominantly seen in the age range 30-49. See Fig. 1 and Table 1.

Thyroid carcinoma (Figs. 2, 3, 4) was the commonest neoplasm seen representing 11.66% and adenoma, 10.60%. The carcinomas were seen predominantly in the age range 30-39 (5.30%), see Table 1 and adenomas in the age ranges of 30-39(3.18%) and 40-49 (3.18%).

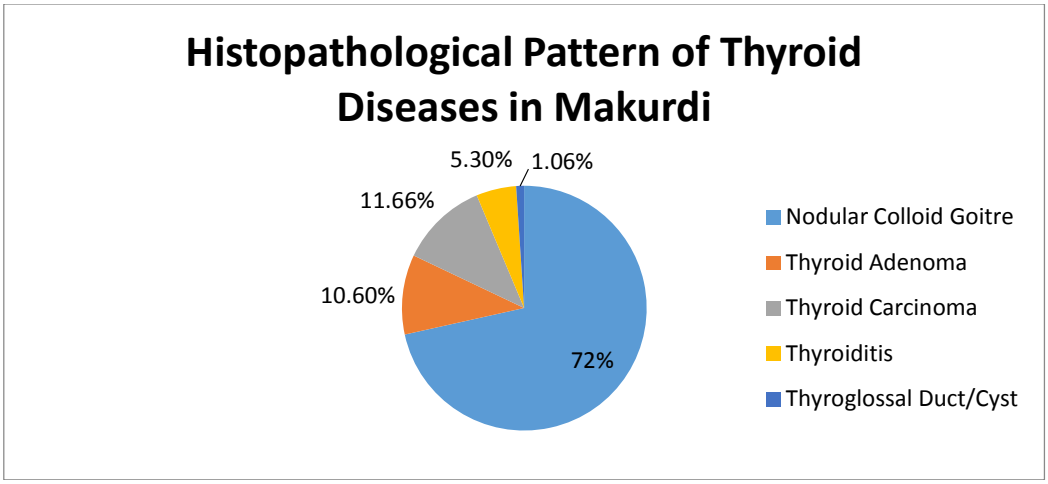

Fig. 1. Pie chart showing histopathological pattern of thyroid diseases in Makurdi, Benue State, Nigeria

Table 1. Age distribution of thyroid disorders in Makurdi. Histopathological pattern

S/No	Age (years)	Nodular colloid goitre	Thyroglossal duct cyst	Thyroid adenoma	Thyroid carcinoma	Thyroiditis	Total	
1	0-9	0	1	0	0	1	1	1.0%
2	10-19	0	0	0	0	0	0	0%
3	20-29	7	0	1	2	0	10	9.7%
4	30-39	22	0	3	5	0	30	32.3%
5	40-49	20	0	3	3	5	31	33.3%
6	50-59	11	0	1	1	0	13	14%
7	60-69	4	0	2	0	0	6	6.5%
8	70-79	3	0	0	0	0	3	3.2%
9	Total	67	1	10	11	5	94	100%
	%	72%	1.01%	10.8%	11.8%	5.4%	100%	

Table 2. Sex distribution of thyroid malignancies in Makurdi

Sex	Total no.	Medullary carcinoma	Papillary carcinoma	Follicular carcinoma	Anaplastic carcinoma	Total no. of malignancy	%
Male	7	1	1	0	0	2	18.18%
Female	87	0	2	7	0	9	81.81%
Total	94	1	3	7	0	11	100%

Table 3. Age distribution of Thyroid malignancies in Makurdi

S/N	Age (years)	Medullary carcinoma	Papillary carcinoma	Follicular carcinoma	Total
1	0-9				
2	10-19				
3	20-29			2	2
4	30-39	1	2	2	5
5	40-49		1	2	3
6	50-59			1	1
7	60-69				
8	70-79				
9	Total	1 (9.09%)	3(27.28%)	7(63.63%)	11(100%)

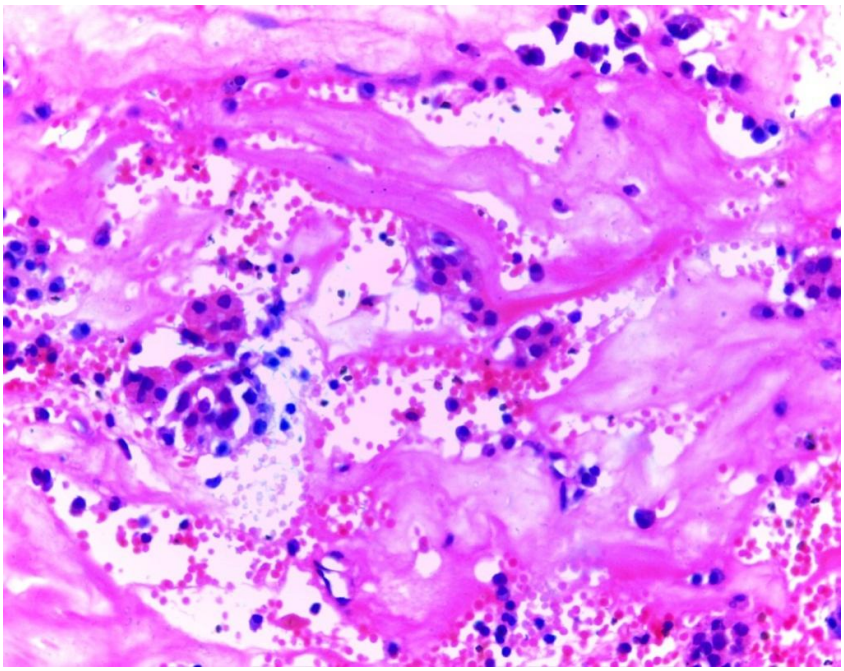

Fig. 2. Medullar carcinoma. Sheets and clumps of compact cells with small round nuclei and very scant cytoplasm with ill-defined boundaries
HE X 20 Obj

A total of 11 thyroid carcinomas were seen; 2(18.18%) in males and 9 (81.82%) in females, giving a male to female ratio of 1:4.5. Table 2 shows sex distribution of thyroid malignancies. Table 3 shows age distribution of thyroid malignancies. Follicular carcinoma is the commonest malignancy with a total of 7 cases (63.63%) and all occurred in females. This was followed by papillary carcinoma with 3 cases (27.27%) and medullary carcinoma with 1 case (9.09%). No Anaplastic carcinoma was seen. There was 1 (1.06%) of thyroglossal duct/cyst and 5 (5.30%) of thyroiditis.

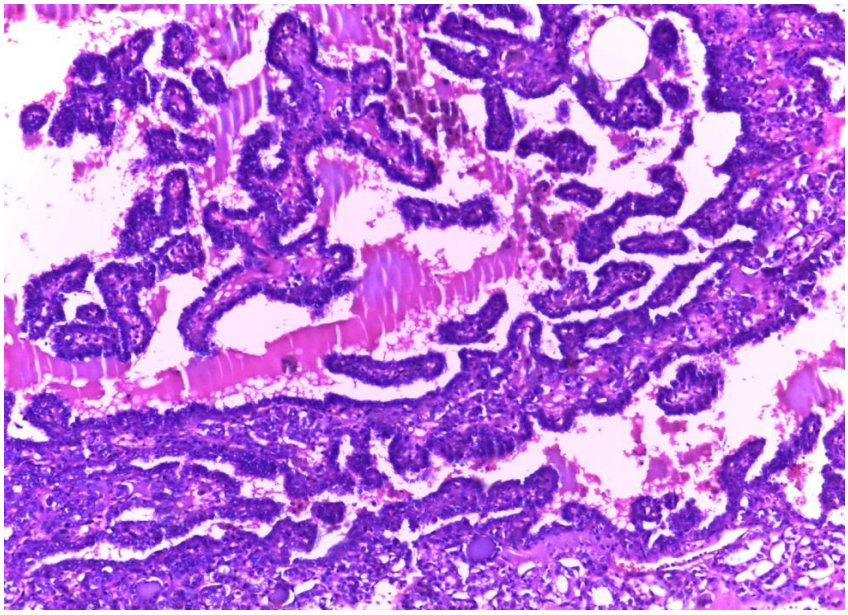

Fig. 3. Papillary thyroid carcinoma. Branching papillary structures with core of vascular connective tissue
HE X 10 Obj

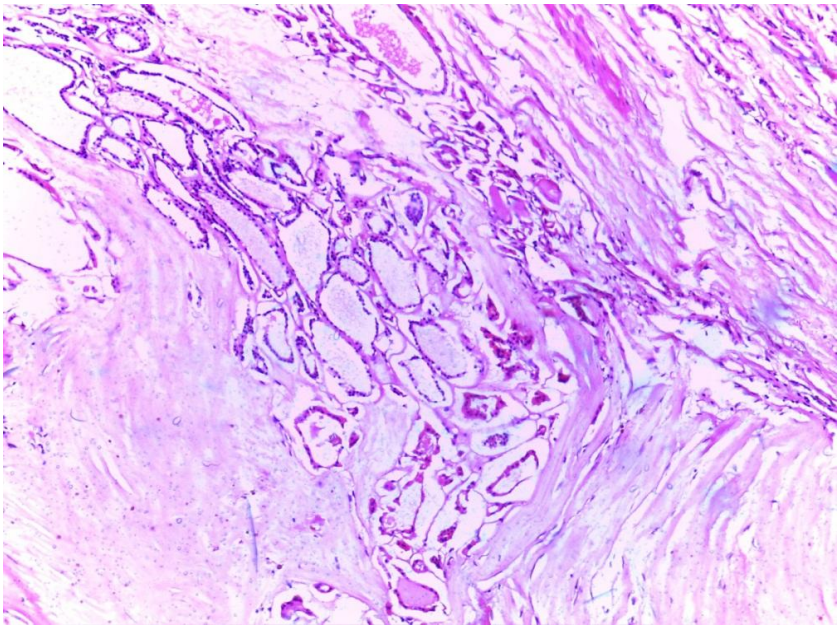

Fig. 4. Follicular carcinoma. Well differentiated, consisting of follicles of fairly uniform shape and variable size with evidence of capsular invasion
HE X10Obj

4. DISCUSSION

Nodular colloid goiter is the commonest thyroid disease in our review and was seen in 67 (72%) of the specimens. This agrees with similar studies in Nigeria and Ethiopia [5,8,9]. The Ilorin, Nigeria work reported 73.4% [11] of cases and the work done in Ethiopia reported 76.9% [12] of total cases studied. This index work also concurred with another East African study, a

retrospective study of 1494 thyroid cases seen at the thyroid clinic of Kenyatta National Hospital which reported 75.2% of total cases seen [13]. Most studies reported nodular colloid goiter as the commonest thyroid disorder with its incidence and prevalence varying from place to place depending on associated etiological factors in such localities [11]. A similar study carried out in Abuja recorded 75% [14] of nodular colloid goiter compared to our own of 72%. Abuja is more mountainous than Makurdi and iodine deficiency, one of the etiological factors for goiters is more common in mountainous areas. A deficient in take of iodine is the dominant cause of the disease with the degree of thyroid enlargement being proportional to the level and duration of disease. It is pertinent to say that both Makurdi and Abuja are located in north central Nigeria. It is also important to note that goitrogens like drugs and minerals that block thyroid hormones formations can also lead to its enlargement [15].

Thyroid neoplasm is the second most common thyroid disease in our study, thyroid carcinoma accounting for 11.8% while adenoma accounts for 10.8%. Our high rate of thyroid carcinoma is in contrast with the study at Abuja where they recorded 3% [14]. Our 11.8% is similar to other studies within and outside Nigeria [6,11,15]. There is a need to do more work with a larger population both in Abuja and Makurdi to explain this disparity. Most cases of carcinoma in our study occurred in the age range 30-39 and 40-49, unlike Abuja study where many of the patients were older 40-59 (66%) and 70-79 (33%). Majority of the carcinomas in our study are follicular carcinoma (63.63%) unlike the Abuja study that reported only papillary carcinoma. This work revealed follicular carcinoma of 7 (63.63%), papillary 3 (27.2%) and medullary 1 (9.09%), (Table 2). No anaplastic carcinoma was recorded. The high incidence of follicular carcinoma is similar to some other Nigerian and African studies [6,11,15] and contrasts with recent findings [4,14]. These differences in the age ranges and relative incidence of the various thyroid malignancies call for further studies.

Thyroiditis, or inflammation of the thyroid gland accounted for 5.4% in our study which agrees with Abuja studies of 7% [14] but higher than Ilorin studies of 0.8% [8], Ethiopian work 2.1% [12] and Kungu 3% [15]. These differences also call for further studies.

Thyroglossal duct/cysts accounted for 1.01% of cases of thyroid disorders seen in this study. It is the most common clinically significant congenital anomaly of the thyroid. A sinus tract may persist as a vestige of the tubular development of the thyroid gland. Part of this tube may be obliterated leaving small segments to form cyst [16]. Moreover, some thyroglossal duct/cyst can be complicated by a papillary adeno- carcinoma [17]. No intra thyroid thyroglossal duct/cyst was seen in this study. The single case of thyroglossal duct/cyst was seen in a male patient and in consonant with our previous work [14] where all the cases were found in male patients.

5. CONCLUSION

Nodular colloid goiter is the commonest thyroid pathology in Makurdi as seen from this study. Follicular carcinoma is the commonest thyroid malignancy while anaplastic carcinoma is rare from this study. There is need for further studies on the peculiar findings of younger age of occurrence of thyroid malignancies in Makurdi and the high incidence of thyroiditis.

CONSENT

It is not applicable.

ETHICAL APPROVAL

Ethical approval was sought and obtained ethical clearance from the Ethical Committee of the Benue State University Teaching Hospital.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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