

# Thyroid Disease at the University Hospital of Conakry, Guinea

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## Abstract

**Objectives:** To describe the epidemiological, clinical and therapeutic characteristics of thyroid disease at the University Hospital of Conakry, Guinea. **Methods:** This was a descriptive study with prospective data collection, carried out over the period of December 2016 to April 2019 at the endocrinology outpatient consultation at the University Hospital of Conakry. All the epidemiological, clinical and therapeutic data of the patients followed-up for thyroid disease were collected, analyzed and classified according to the epidemiological, clinical and therapeutic profile. The functional, morphological and autoimmune aspects of the thyroid gland were studied. **Results:** Out of a total of 3.517 endocrinology consultations during the study period, 204 patients were diagnosed with thyroid disease (180 women and 24 men, F/H ratio: 7.5). The average age was  $47 \pm 16$  years. A total of 90 patients (44.33%) had hyperthyroidism, including 52 cases of Graves-Basedow disease (57.6%) and 24 cases of toxic multi-nodular goiter (32.6%). Hypothyroidism was confirmed in 25 patients (11%); about half (48%) of them had a complete thyroid surgery. The treatment of hyperthyroidism was exclusively done by synthetic antithyroid drugs, except 5 cases of Hashimoto disease with transient initial hyperthyroidism phase. Hypothyroidism was treated by hormone replacement therapy. Thyroidectomy, partial (n = 5) or total (n = 12), was performed for aesthetic discomfort (n = 6), cervical compression (n = 8) and suspicion of thyroid cancer (n = 3). Follow-up was considered regular in 40 cases (44%). **Conclusion:** Thyroid disease was frequent in this study conducted in Conakry and its clinical features were very diverse, dominated by hyperthyroidism mainly due to Grave disease. However, diagnostic and therapeutic strategies were hindered by the limitation in availability of biological and morphological explorations.

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## Keywords

Goiter, Hyperthyroidism, Hypothyroidism, Guinea

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### 1. Introduction

Thyroid gland disease is the most common endocrinopathy after diabetes mellitus. In developing countries, this condition was traditionally confined to endemic goiter in connection with the high prevalence of iodine deficiency [1]. However, since the rise of salt iodization programs in the early 1990s, endemic goiter has been declining, giving way to the emergence of other manifestations of thyroid disease, particularly autoimmune diseases [1] [2] [3]. Indeed, the clinical, biological and morphological manifestations are diverse, requiring a typological approach to this pathology.

In Guinea, the frequency of thyroid disease in endocrinology consultations at Conakry University Hospital was 3% in 2007, dominated by hyperthyroidism [4].

The objective of this study was to describe the epidemiological, clinical and therapeutic characteristics of thyroid pathology at the University Hospital of Conakry, Guinea.

### 2. Methods

#### 2.1. Setting, Population and Design

This was a descriptive study with prospective data collection between December 2016 and April 2019. All patients received consecutively in the Endocrinology Department of the University Hospital of Conakry for a thyroid gland disease were included in the study.

A systematic anamnesis and clinical examination seeking for signs of dysthyroidism, cervical compression, inflammation and malignancy arguments was performed.

- Depending on the clinical context, hormonal (ultrasensible Thyroid Stimulation Hormone—TSH<sub>s</sub>; Free Triiodothyronin—FT<sub>3</sub>; and Free Tetraiodothyronin—FT<sub>4</sub>), inflammatory, immunological (thyroperoxidase, thyroglobulin and TSH receptor antibodies), morphological (ultrasound and thyroid scintigraphy), and cytological (thyroid fine needle aspiration biopsy) assessment was performed. Thyroid disease was classified into different nosological categories according to the following criteria:
- Hyperthyroidism: defined by the observation of clinical manifestations of hyperthyroidism (or thyrotoxicosis) associated with an increase in FT<sub>3</sub> and FT<sub>4</sub> levels, and a decrease in TSH<sub>s</sub> levels.
- Hypothyroidism: defined by the clinical manifestations of hypothyroidism with a decrease in FT<sub>3</sub> and FT<sub>4</sub> levels and an increase in us-TSH levels.
- Graves-Basedow disease: defined as hyperthyroidism with positive TSH re-

ceptor antibodies. In the absence of TSH receptor antibodies available, the diagnosis of Grave disease was based on a range of epidemiological and clinical arguments (hyperthyroidism, exophthalmia, appearance of goiter, age and sex).

- Hashimoto's thyroiditis: defined by goiter with positive thyroperoxidase and more or less thyroglobulin antibodies, comforted by the presence of hypothyroidism.
- Toxic thyroid nodule: defined by the association of hyperthyroidism with an isolated thyroid nodule, identified by palpation of the cervical region or ultrasound, without exophthalmia or pre tibial myxedema.
- Toxic nodular goiter: combined thyrotoxicosis and clinical or ultrasound multi-nodular goiter, without exophthalmia or pre tibial myxedema.
- Iodine induced hyperthyroidism: defined by the observation of hyperthyroidism following a prolonged use of iodized products (*i.e.* amiodarone) in a patient with no history of hyperthyroidism prior to the iodine intake.
- Thyroid cancer: suspected by the association of growing nodule or goiter with suspicious palpatory and/or ultrasonography signs and or altered general condition. Confirmation was done by histopathological analysis.

## 2.2. Ethical Aspects

Informed consent was obtained for the collection and analysis of patient data and anonymity was respected in accordance with the Helsinki Declaration on Human subject research.

## 2.3. Statistical Analysis

The data were entered and analyzed using the SPSS software version 22. Continuous variables were presented as mean and standard deviation if the distribution was normal, otherwise as median and interquartile range. The categorical variables were presented in numbers and percentages. No association or causality tests were performed.

## 3. Results

Out of a total of 3517 endocrinology consultations during the study period, thyroid pathology involved 204 patients (180 women and 24 men, F/H ratio: 7.5). The average age was  $47 \pm 15$  years (range: 2 - 85). The description of patients by socio-professional category and residence is presented in **Table 1**. Housewives predominated (39.70%), followed by the formal sector (31.37%). The majority of patients (63%) resided in the capital city, Conakry.

Hormonal assessment was performed in 177 patients (86.76%), including the determination of us-TSH in 87% of cases, FT4 in 74% of cases and FT3 in 26% of cases. TSH receptor antibodies were performed in 19 patients, positive in 89% of cases, while thyroperoxidase antibodies were performed in 16 patients, 62.5% of whom were positive.

**Table 1.** Baseline characteristics of patients.

Characteristics	Mean $\pm$ SD	Number (%)
<b>Age at diagnosis (years)</b>	47 $\pm$ 15	-
<b>Female</b>	-	180 (88.23)
<b>Profession</b>		
• Housewife	-	81 (39.70)
• Student	-	13 (6.37)
• Formal sector	-	64 (31.37)
• Informal sector	-	32 (15.68)
• Other	-	14 (6.88)
<b>Provenance</b>		
• Conakry	-	130 (63.72)
• Out of Conakry	-	74 (36.28)

Sex-ratio (F/H): 0.75.

Thyroid ultrasound was performed in 73% of cases leading to thyroid fine needle aspiration biopsy in one case corresponding to a benign nodule. Thyroid scintigraphy was performed in 1 case showing homogeneous iodine hyperfixation.

**Table 2** describes the thyroid disease by different nosological features. Hyperthyroidism was found in 90 patients (44.1%) with etiologies dominated by Grave's disease in 52 patients (57.78%) and toxic multi-nodular goiter in 24 patients (26.6%). Hypothyroidism was present in 25 patients (12.3%) with thyroid surgery as the leading cause (12 cases; 48%), followed by Hashimoto's thyroiditis in 9 cases (36%). A total of 88 patients (43.1%) had a normal thyroid function with simple multi-nodular goiter in the majority of cases (62.5%).

All patients with hyperthyroidism, except 5 cases of Hashimoto's disease with transient initial hyperthyroidism, were treated with synthetic antithyroid drugs. A surgical indication was chosen in 25 patients, 17 of whom underwent surgery. Partial (n = 5) or complete (n = 12) thyroid surgery was performed in the presence of aesthetic discomfort (n = 6), cervical compression symptoms (n = 8) and for suspicion of thyroid cancer (n = 3). Hormone replacement therapy by levothyroxine was used in all patients with hypothyroidism.

## 4. Discussion

In this study, the frequency of thyroid disease was 17.24%. It is the most common endocrinopathy after diabetes mellitus in our context. This frequency is higher than the 3% found by Baldé NM *et al.* in 2007 in Conakry [4]. This study certainly has its limitations, in particular the modest size of the sample and the lack of systematic hormonal and immunological testing. However, it had the merit of having, for the first time in our country, data on all thyroid pathology.

Thyroid disease is commonly known as a condition of young adult women. This female predominance of thyroid disorders was confirmed in this study with a ratio of approximately 8 women to 1 man. The average age of our patients was

**Table 2.** Description of thyroid disease by nosological category from December 2016 to April 2019 at the University Hospital of Conakry, Guinea.

Clinical features	Number of cases	Percentage
<b>Hyperthyroidism</b>	<b>90</b>	<b>44.1</b>
Graves-Basedow disease	52	57.78
Toxic multiple nodular goiter	24	26.6
Toxic nodule	8	8.9
Thyroiditis	5	5.56
Surcharge iodée	1	1.1
<b>Normal thyroid function</b>	<b>88</b>	<b>43.1</b>
Simple goiter	8	9.1
Single nodule	21	23.9
Simple multiple nodular goiter	55	62.5
Thyroiditis	4	4.5
<b>Hypothyroidism</b>	<b>25</b>	<b>12.3</b>
Post-surgery	12	48
Hashimoto disease	9	36
Post-carbimazole	2	8
Congenital	1	4
Central	1	4
<b>Thyroid cancer</b>	<b>1</b>	<b>0.50</b>
<b>Total</b>	<b>204</b>	<b>100</b>

47 years. Indeed, the average age at diagnosis is in the forties in most African series [5] [6]. The majority of the patients in the study resided in the capital, which could be explained on the one hand by the choice of the urban site of the study but also by the lower accessibility to specialized care outside the capital, Conakry.

The etiologies of thyroid disease were dominated by the Graves-Basedow disease responsible for hyperthyroidism and found mainly in young women. This observation remains constant in most African series and over the world. Indeed, the frequency of Graves-Basedow disease ranged from 28% to 83.3% in these series [4] [7] [8] [9].

Hypothyroidism, described in 12% of cases in the present study, seems to be under-estimated. Indeed, the predominantly post-surgical etiology of hypothyroidism found in this cohort raises the question of the diagnosis of hypothyroidism related to autoimmune thyroiditis, which was 36%. In the African series, hypothyroidism appears to be less frequent compared to the Western series, probably linked to an under-diagnosis of Hashimoto autoimmune thyroiditis [4] [10] [11]. Patients with normal thyroid function, most of them carrying multi-nodular goiter in this study, are candidate to close surveillance seeking for signs of tumor progression and/or thyroid dysfunction. The rate of thyroid cancer confirmed in 1 case (0.5%) among 3 suspected cases who underwent thyroid surgery is marginal this study in coherence with the low rate (below 1%) found in most of the studies conducted in Africa [12]. These rates seem consistent with the rarity of thyroid cancer in general and the lack of screening and diagnostic

procedures in our context, including thyroid fine needle aspiration biopsy and histopathological analysis.

However, it has to be mentioned that there is variability in the nosological distribution of thyroid disease in Africa in general, linked to the socio-demographic heterogeneity of the populations studied on one hand and, on the other hand, to the difficulties of access to biological and morphological exploration for diagnostic [1] [5] [9] [13]. The hormonal exam, particularly us-TSHus, was performed by 87% of patients, which seems to be a good rate in our practice context. This frequency is higher than the 46.66% found by Akoussou SY *et al.* [8] in Togo in 2001 and the 70% found by Baldé NM *et al.* in 2007 [4] in Guinea. The TSH-receptor antibodies were performed in 19 patients with a positive result in 89% of cases corresponding to 17 Graves-Basedow disease, the two negative being Hashimoto disease with initial hyperthyroidism phase. Thyroperoxidase antibodies were performed in 16 patients, 62.5% of whom were positive. Access to the thyroid diagnostic tools, particularly the immunological laboratory exam, remains very limited in our context.

Regarding the morphological explorations, the thyroid ultrasound performed in 74% of patients and the thyroid fine needle aspiration biopsy in a single patient highlights the challenge in accessing to the essential diagnostic tools for a comprehensive management of thyroid disease in this context. Indeed, these diagnostic tools are essential to characterize the thyroid disease for a better care [14].

The treatment by synthetic antithyroid drugs for hyperthyroidism and hormone replacement therapy with levothyroxine for hypothyroidism, which was the common practice in this study, is classic in the thyroid disease. Thyroid surgery was mostly complete and performed in the presence of signs of local complications, explaining the high rate of post-surgery hypothyroidism found in this study.

## 5. Conclusion

Thyroid disease is a frequent outpatient condition at the University Hospital of Conakry in Guinea. A large range of clinical features are found, dominated by hyperthyroidism, particularly by Graves-Basedow disease. Diagnostic and therapeutic strategies are made difficult by the limited means of exploration available and/or accessible in Guinea. However, diagnostic and therapeutic strategies were hindered by the limitation in availability of biological and morphological explorations.

## Conflicts of Interest

The authors declare that they do not have any conflict of interest for this article.

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