


Thyroid Goiters and Nodules: Epidemiological, Clinical, Paraclinical, and Therapeutic Aspects at the Fellah Polyclinic, Conakry

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Abstract

Introduction: The aim of this study was to describe the epidemiological, clinical, paraclinical, and therapeutic characteristics of thyroid goiters and nodules at the Polyclinic Fellah in Conakry. **Methods:** This was a descriptive cross-sectional study with prospective data collection conducted from June 1, 2016, to December 31, 2024. It included all patients being followed for thyroid pathologies at the Polyclinic Fellah in Conakry. **Results:** Out of a total of 500 patients followed for thyroid pathologies, 450 patients (90%) had thyroid goiters and nodules, with a clear female predominance (sex ratio = 0.16) and an average age of 45.7 ± 15.3 years. Anterior cervical swelling was the main reason for consultation (43.8%), and 61.3% of patients sought consultation within a year of the onset of symptoms. On ultrasound, lesions classified as EU-TI-RADS 3 were the most frequent (26.7%). Functionally, 268 patients (60.0%) presented with hyperthyroidism, with Graves' disease being the predominant etiology (56.7%). Hypothyroidism was confirmed in 27 patients (6.0%), and Hashimoto's thyroiditis was found in 15 patients (55.6%). Hyperthyroidism was treated with synthetic antithyroid drugs, while hypothyroidism was managed with hormone replacement therapy. Thyroidectomy was indicated in 71 patients, but it was performed in only 21 patients (29.6%), either partially (n = 15) or totally (n = 6). The reasons for thyroidectomy included aesthetic discomfort (n = 8), cervical compression (n = 9), and oncological concerns (n = 3). Follow-up was considered regular in 37% of cases. **Conclusion:** Thyroid goiters and nodules are common and predominantly affect women. Their management requires a multidisciplinary approach.

Keywords

Goiters, Nodules, Thyroid, Guinea

1. Introduction

Thyroid pathologies, particularly thyroid goiters and nodules, are among the main endocrine disorders after diabetes and represent a major cause of endocrinology consultations [1]. These conditions can arise from various pathophysiological mechanisms, including iodine deficiency, autoimmune dysfunction, or genetic abnormalities, leading to functional and/or anatomical changes in the thyroid gland [2].

Goiter is defined as an increase in thyroid volume and can present in different forms: diffuse or localized, unilobular or multilobular, benign or malignant [3]. Thyroid ultrasound is a key tool in the classification of nodules, differentiating benign lesions from potential malignancies [4]. The worldwide prevalence of thyroid nodules is estimated to be between 2% and 6% when detected clinically and between 19% and 35% when identified through imaging [5].

In Guinea, available data suggest a predominance of multinodular goiter in euthyroids, with Graves' disease being the dominant etiology for hyperthyroid forms [6]. Given these public health issues, an update on epidemiological and clinical data regarding thyroid goiters and nodules is necessary. The aim of this study was to describe the epidemiological, clinical, and paraclinical characteristics, as well as the treatment modalities, of thyroid goiters and nodules at the Polyclinic Fellah in Conakry.

2. Methods

This was a descriptive cross-sectional study with prospective data collection over the period from 1 June 2016 to 31 December 2024 (103 months). The Fellah polyclinic in Conakry, a reference center for endocrine diseases, served as the setting for this study. All patients who received treatment consecutively for a thyroid goiter or nodule, diagnosed clinically and/or by thyroid ultrasonography, were included, irrespective of age and sex. Thyroid volume was assessed according to the De Mayer classification, adopted by the World Health Organization (WHO), which distinguishes four stages [7].

Patients were interviewed regarding their age, sex, profession, place of residence, and family and personal history. They underwent a systematic clinical examination for signs of dysthyroidism (hypometabolism, myxedematous syndrome, or thyrotoxicosis), compression symptoms (dysphagia, dysphonia, cough, and dyspnea), cardiothyreosis (heart failure and rhythm disorders), inflammation, and clinical indicators of malignancy.

Depending on the clinical context, additional investigations were proposed. These included hormonal tests (TSH, free T3, and free T4), inflammatory markers

(sedimentation rate, C-reactive protein, and complete blood count), immunological tests (anti-thyroperoxidase antibodies (anti-TPO), anti-thyroglobulin antibodies (anti-TG), and TSH receptor antibodies (TRAK)), as well as imaging studies, notably cervical ultrasound with determination of the EU-TIRADS (European Thyroid Imaging Reporting and Data System) classification [8]. Thyroid scintigraphy and cytology (thyroid fine-needle aspiration in the case of thyroid nodules) were also performed. The Bethesda classification, revised in 2017, was used to characterize the benign or malignant nature of the nodules [9].

Thyroid pathologies were classified into different nosological categories according to the following criteria:

- **Peripheral hyperthyroidism:** Defined as the presence of clinical manifestations of thyrotoxicosis associated with increased levels of thyroid hormones (free T3 and free T4) and decreased levels of TSH.
- **Peripheral hypothyroidism:** Characterized by clinical manifestations of hypometabolism associated with decreased levels of thyroid hormones (free T3 and free T4) and increased levels of TSH.
- **Graves' disease:** Diagnosed based on the association of hyperthyroidism with diffuse and vascular goiter, acquired exophthalmos, pretibial myxedema, and TRAK positivity.
- **Hashimoto's thyroiditis:** Characterized by goiter and the presence of anti-TPO or anti-TG antibodies, most often associated with hypothyroidism.
- **Toxic adenoma:** Defined by the association of thyrotoxicosis with an isolated hyperfixating thyroid nodule, without exophthalmos or pretibial myxedema.
- **Toxic multi-nodular goiter:** Characterized by thyrotoxicosis associated with a hyperfixating multi-nodular goiter, without exophthalmos or pretibial myxedema.
- **Hyperthyroidism due to iodine overload:** Observed in a patient with no history of hyperthyroidism, following prolonged use of iodine products.
- **Thyroid cancer:** Confirmed by the presence of malignant cells found on cytology obtained through fine-needle aspiration.

In the interests of confidentiality, no information regarding patients' marital status was disclosed. Data were collected using a questionnaire, then entered and analyzed using SPSS version 30.0 software. Proportions were compared using the Chi² test, and means were compared using the Student's t-test. The significance level was set at less than 5%.

3. Results

3.1. Sociodemographic Data

Out of a total of 500 patients followed for thyroid pathology, 450 had a thyroid goiter or nodule, resulting in a frequency of 90.0%. The most common age range was 32 to 41 years (22.2%), with a mean age of 45.7 ± 15.3 years. Females predominated, accounting for 86.0% of cases, with a sex ratio of 0.16. The most represented socio-professional category was housewives (37.3%), followed by formal sec-

tor employees (33.3%), informal sector workers (18.5%), pupils/students (8.7%), the unemployed (1.3%), and pensioners (0.9%). Most patients lived in Conakry (75.6%), compared to 24.4% from other regions of the country. In approximately two-thirds of cases (67%).

3.2. Clinical Manifestations

According to the structural classification, thyroid pathologies were heterogeneous in more than half of the cases (54.4%). Among these, multinodular goiters accounted for 79.1%, while uninodular goiters represented 20.9%. A homogeneous goiter was found in 45.6% of cases, with vascular involvement noted in almost one-third (31.4%) of these cases. Local inflammatory signs and satellite adenopathy were observed in 2.2% and 1.8% of cases, respectively.

According to the WHO classification, goiters were categorized as follows: stage II in 30.1% of cases, stage Ib in 27.4%, stage Ia in 21.1%, stage III in 18.2%, and stage 0 in 3.3%. Signs of compression were present in 72.6% of patients, predominantly manifested as dyspnea (57.6%), followed by dysphagia (8.7%) and dysphonia (6.4%). In almost two-thirds of cases (61.3%), the delay in consultation exceeded 12 months.

A family history of thyroid disease was reported in 44.9% of cases. Thyrotoxicosis syndrome was found in 268 patients (60.0%). Among the 268 cases of hyperthyroidism, these were: general signs (weight loss 58.4% and physical asthenia 72%), cardiovascular signs (palpitations 68.9% and dyspnea 54.4%), neuropsychiatric signs (nervousness 43.0%, insomnia 41.6% and thermo-phobia 18.0%) and accelerated transit in 15% of cases. Physical signs were represented by tremors (40%), tachycardia (57%), wetness (40%), and osteo-tendinous hyperreflexia (45.0%). The 27 cases of hypothyroidism (6.03%) involved a hypometabolism syndrome (constipation 80%, chilliness 60%, hair loss 15% and bradycardia 10%), weight gain 70% and hoarseness of voice 30%. Other clinical manifestations were: acquired exophthalmos (68 cases, 44.7%, unilateral in 7.3%), pretibial myxedema (26 cases, 17.1%). Cardiothyreosis was present in 11 cases (7.2%) of hyperthyroid patients. These included 06 cases of heart failure, 05 of atrial fibrillation and 2 of conduction disorder.

A family history of thyroid disease was reported in 44.9% of cases. Thyrotoxicosis syndrome was observed in 268 patients (60.0%). Among these cases of hyperthyroidism, the following general signs were noted: weight loss (58.4%) and physical asthenia (72.0%). Cardiovascular signs included palpitations (68.9%) and dyspnea (54.4%). Neuropsychiatric signs consisted of nervousness (43.0%), insomnia (41.6%), and thermophobia (18.0%), while accelerated intestinal transit was present in 15.0% of cases. Physical signs associated with hyperthyroidism included tremors (40.0%), tachycardia (57.0%), diaphoresis (40.0%), and osteo-tendinous hyperreflexia (45.0%).

In contrast, hypothyroidism was identified in 27 cases (6.0%), characterized by a hypometabolism syndrome that included constipation (80.0%), chilliness (60.0%),

hair loss (15.0%), and bradycardia (10.0%). Additionally, weight gain was reported in 70.0% of hypothyroid patients, while hoarseness of voice was noted in 30.0%.

Other clinical manifestations included acquired exophthalmos in 68 cases (44.7%), with unilateral exophthalmos observed in 7.3% of these cases. Pretibial myxedema was present in 26 cases (17.1%). Cardiothyreosis was observed in 11 hyperthyroid patients (7.2%), including 6 cases of heart failure, 5 cases of atrial fibrillation, and 2 cases of conduction disorders.

3.3. Complementary Investigations

Hormonal investigations were conducted in all 450 patients. These included TSH (100%), free T4 (82%), and free T3 (27%). Immunological tests were carried out abroad for those who could afford them. Anti-TSH receptor antibodies (TRAK) were assessed in 46 patients with Graves' disease (30.3%), returning positive results in 71.7% of cases, with a mean level of 46.6 ± 13.4 IU/l. Anti-thyroperoxidase (TPO) antibodies were measured in 22 patients, with 50% testing positive, while thyroglobulin (anti-TG) antibodies were assessed in 17 patients, of whom 21.8% were positive.

Thyroid ultrasonography was performed on 323 patients (71.7%). According to the EU-TIRADS classification, the most frequently identified nodules were classified as EU-TIRADS 3 (37.2%), followed by EU-TIRADS 4A (27.9%) and EU-TIRADS 2 (26.0%). Thyroid scintigraphy, which was performed on 12 patients abroad, revealed homogeneous fixation in 58.3% of cases, extinct nodules in 25.0%, and cold nodules in 16.7%. Among the five patients who underwent cytology, 80.0% had Bethesda II lesions, while 20.0% had Bethesda IV lesions.

3.4. Etiological Forms (See Table 1)

A total of 155 patients (34%) were euthyroid. The etiologies of euthyroidism were predominantly due to simple multinodular goiter (69.7%), followed by simple goiter (16.1%) and simple adenoma (14.2%). Thyroid cancer was suspected in three patients.

Hyperthyroidism was observed in 268 patients (60%). The etiologies of hyperthyroidism included Graves' disease (152 cases, 56.7%), toxic multinodular goiter (76 cases, 28.4%), toxic adenoma (19 cases, 7.1%), thyroiditis (17 cases, 6.3%), and hyperthyroidism due to iodine overload in four cases (1.5%).

The etiologies of hypothyroidism (27 cases, 6%) were primarily Hashimoto's thyroiditis (55.6%), with iatrogenic hypothyroidism due to synthetic antithyroid drugs in 7 cases, and endemic goiter in 5 cases. Other notable pathologies included arterial hypertension (214 cases, 47.6%), diabetes mellitus (80 cases, 17.9%), and vitiligo and rheumatoid arthritis, each affecting 2 cases.

3.5. Therapeutic Aspects

All patients with persistent hyperthyroidism were treated with synthetic antithyroid drugs. Carbimazole was prescribed in 96.7% of cases, with titration used in

Table 1. Distribution of patients by diagnosis.

Diagnostic	Number	Frequency (%)
Euthyroid goiter	155	34.0
Multi-hetero-nodular goiter	108	69.7
Simple goiter	25	16.1
Simple adenoma	22	14.2
Hyperthyroid goiter	268	60.0
Graves' disease	152	56.7
Toxic adenoma	19	7.1
Toxic multinodular goiter	76	28.4
Hashi-toxicosis	11	4.1
De Quervain's thyroiditis	6	2.2
Iatrogenic	4	1.5
Hypothyroid goiter	27	6.0
Hashimoto's thyroiditis	15	55.6
Synthetic antithyroid	7	25.9
Endemic goiter	5	18.5

91.5% and a block-replace regimen (maintaining high doses and combining with thyroxine to avoid hypothyroidism) in 8.5% of cases. No clinical side effects, particularly hematological issues, were observed. Other medical prescriptions included rest combined with a sedative (50%), beta-blockers (74%), and anti-inflammatories (3.1%). Patients with cardiothyreosis were monitored concurrently by a cardiologist, and progress was favorable in all cases under this treatment. All hypothyroid patients received hormone replacement therapy with levothyroxine.

Thyroidectomy was indicated for 71 patients (15.7%), but only 21 patients (29.6%) accepted the procedure. The types of thyroidectomy performed included total (66.7%), subtotal (23.8%), and lobo-isthmectomy (9.5%). Indications for surgery were aesthetic discomfort (n = 8), signs of compression (n = 9), and oncological concerns (n = 3). Pathologically, benign tumors comprised 85.7% of cases (with 35% being follicular adenomas), while cancers accounted for 15.3% (2 papillary and 1 follicular carcinoma). Chemotherapy, radiotherapy, and intratherapy were not available in our setting.

No deaths or postoperative complications were observed. Follow-up was considered regular in 37% of cases. Treatment discontinuation occurred in nearly one-third of patients (32%), and another third (33.0%) were lost to follow-up. Follow-up was deemed regular in 57 cases.

4. Discussion

The prevalence of thyroid goiters and nodules observed in our study (90.0%) is

comparable to the 95.0% reported by Kaké A. *et al.* in Guinea in 2020 [6]. This high prevalence is also documented in other African studies and may be explained by environmental, nutritional, and genetic factors.

The mean age of patients in our study (45.7 ± 15.3 years) is similar to that reported by Bidossessi V. *et al.* in Benin in 2020 (44.24 years) [10], but higher than that of El Sayed I. *et al.* in Egypt in 2019 (36.96 years) [11]. These variations can be attributed to demographic, genetic, and environmental differences, including iodine intake and other nutritional factors that influence the occurrence of thyroid pathologies.

The clear female predominance (86.0%) observed in our study aligns with the literature [10] [12]-[14], which consistently reports a higher incidence of thyroid disease in women. Our findings are consistent with those of Abodo J. *et al.* in Côte d'Ivoire in 2019, who reported a sex ratio of 0.16 [1]. This increased prevalence may be linked to the modulating effect of sex hormones, particularly estrogen and progesterone, which influence the immune response and promote certain autoimmune pathologies such as Graves' disease and Hashimoto's thyroiditis.

The median consultation time observed in our study is shorter than that reported in other African series [12] [15] [16]. A prolonged delay in management can lead to the progression of goiters into more complicated forms, particularly through the development of nodules, cystic formations, or compressive signs [17]. Addressing this delay is a major challenge for improving early management and limiting complications.

Additionally, the presence of a family history of thyroid pathology in 44.9% of cases underscores the role of genetic factors in the pathophysiology of goiter. This prevalence is comparable to that reported by Sagna Y. *et al.* in Morocco in 2024 [12] and Adamou H. *et al.* in Niger in 2024 [15], who found respective rates of 50.0% and 36.8%. These findings highlight the need for targeted screening in individuals with a predisposed family background.

Regarding the WHO classification of goiters, we observed a predominance of stages II (30.1%), followed by stages Ib (27.4%) and Ia (21.1%). These results differ from those reported by Adamou H. *et al.* in Niger in 2024 [15], where stage III goiters predominated (84.55%). This discrepancy could be explained by a longer consultation delay in their study (median 4 years), favoring progression to larger forms.

Thyroid hormone assessment revealed a high prevalence of hyperthyroidism (60.0%), followed by euthyroidism (34.0%) and hypothyroidism (6.0%). Our results are comparable to those of Saïdou A. *et al.* in Niger in 2021, who reported hyperthyroidism in 51.85% of cases [16]. The high prevalence of hyperthyroidism in our series could be linked to late diagnosis, compounded by constraints on access to care and biological tests due to financial barriers.

Ultrasound evaluation according to the EU-TIRADS classification showed a predominance of nodules classified as EU-TIRADS 3 (37.2%), followed by EU-TIRADS 4A (27.9%) and EU-TIRADS 2 (26.0%) stages. These results are lower

than those of Garba I. *et al.* in Côte d'Ivoire in 2023, who reported a prevalence of 55.3% for EU-TIRADS 3 nodules [18]. These disparities may be explained by differences in ultrasound expertise and limited accessibility to thyroid imaging in our context, favored by economic constraints.

In terms of etiology, our results indicate a predominance of multi-heteronodular goiter among euthyroid goiters (69.7%), Graves' disease among hyperthyroid goiters (56.7%), and Hashimoto's thyroiditis among hypothyroid goiters (55.6%). These trends are consistent with the literature, including the findings of Abodo *et al.* in Côte d'Ivoire in 2019 [1], who reported similar frequencies for these conditions.

Regarding therapeutic management, hyperthyroid patients were primarily treated with synthetic antithyroid drugs, predominantly carbimazole (96.7%), often combined with beta-blockers (32.7%) and anxiolytics (25.1%). Initiating medical treatment is essential to stabilize thyroid function before any surgical intervention.

Thyroid surgery was performed on 4.7% of patients, which is similar to the proportions reported by Kaké A. *et al.* in Guinea in 2020 (14.44% operative indications, but with a lower completion rate) [6]. This reluctance to undergo thyroid surgery may be linked to aesthetic and cultural considerations, as well as a fear of operative risks, particularly in the absence of optimal management for potential complications. The introduction of alternative techniques, such as laser thermoablation or iratherapy, could improve patient compliance with surgical options.

Finally, compliance with post-treatment follow-up remains a significant challenge, with only 30.0% of patients maintaining regular follow-up. The irregularity of follow-up and the high rate of patients lost to follow-up (33.0%) reflect difficulties in accessing care, economic constraints, and a lack of awareness about the importance of follow-up, especially in a context where nearly half the population lives below the poverty line [19]. This situation parallels the observations of Diedhiou *et al.* in Senegal in 2021 [20]. Implementing therapeutic education strategies and improving access to specialized care could enhance patient compliance with medical follow-up, thereby optimizing the management of thyroid pathologies.

5. Limitations

This study provides current hospital data on goiters and nodules in Conakry. However, it has limitations related to sample size, high costs, and local unavailability of certain complementary investigations, particularly in immunology and anatomopathology. Consequently, diagnostic certainty could not be established in all cases. Additionally, the data cannot be extrapolated to the entire Guinean population.

6. Conclusion

Thyroid goiters and nodules are common manifestations of thyroid pathology at the Fellah Polyclinic. They can occur at any age, with a predominance in young adult women. Delayed consultations often lead to complications, particularly nod-

ulogenesis and hyperthyroidism. Ultrasound evaluations typically reveal most lesions to be benign. Implementing therapeutic education strategies, along with enhanced access to specialist care, could improve patient compliance with medical follow-up and optimize the management of these conditions.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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