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Study on Thyroid Dystrophy in the Internal Medicine Department of Point G University Hospital

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Abstract

Introduction: Thyroid dysfunction refers to all thyroid conditions characterized by permanent and disordered secretion of thyroid hormones. Methods: This was a descriptive study with retrospective data collection that took place over a period of 4 years and 2 months, and prospectively over 10 months, in internal medicine at Point G University Hospital. Data were collected from medical records, entered, and analyzed with SPSS version 2.0. Results: A retrospective analysis of 8,516 consulted and/or hospitalized patients identified 337 cases of thyroid dysfunction, yielding a hospital frequency of 3.95%. The cohort had a mean age of 43.74 ± 15.14 years and was predominantly female (82.2%), with a sex ratio: males/females (60/277) = 0.22. The condition was most frequently discovered through the presence of goiter or clinical signs suggesting hyperthyroidism or hypothyroidism. Cytological and clinical examinations revealed that multinodular goiter was the most common etiology (36.21%), followed by thyroid vesicular adenoma (27.78%). Among hyperthyroid cases, Graves' disease was the predominant cause, accounting for 24.9% of instances. Therapeutically, 30% of the cohort underwent thyroidectomy, which subsequently resulted in postoperative hypothyroidism. Major complications included cardiothyreosis, which was observed in 11.2% of hyperthyroid and 8.3% of hypothyroid patients. Cardiothyreosis is functional and sometimes structural

damage to the heart linked to the excessive action of thyroid hormones. Conclusion: Thyroid dystrophy is a common disease with female predominance. The clinical expression is polymorphic. The most common causes are Graves' disease and thyroidectomy.

Keywords

Thyroid Dysfunction, Goiter, Multinodular, Adenoma, Thyroidectomy, Cardiothyreosis

1. Introduction

Thyroid dysfunction encompasses a spectrum of disorders characterized by the dysregulation of thyroid hormone secretion [1]. Globally, these conditions demonstrate a significant disease burden and a marked female predominance. For instance, data from the French SU-VI-MAX study reported an incidence of 2.3% in women aged 35 - 44, rising to 3.6% in those aged 45 - 60, while the incidence in men was significantly lower at 0.5% [2]. Similarly, hypothyroidism has a reported frequency of 2.5% - 14% in the general population, with a pronounced female-to-male sex ratio of 0.1 [3]. Hyperthyroidism also shows a considerable prevalence, with an annual incidence of 0.6 per 1000 women and a reported prevalence of 1.3% in the United States [4].

In Mali, the epidemiological profile of thyroid disease is shaped by distinct regional challenges, including a high prevalence of endemic goiter, estimated at 60% [5], and limited access to diagnostic resources such as thyroid hormone assays, which are often cost-prohibitive for patients in the absence of comprehensive national health coverage. Previous studies within the Internal Medicine Department of Point G University Hospital, a national reference center for endocrine disorders, have highlighted the local significance of these pathologies. A 2011 study identified 71 cases of hypothyroidism with a female predominance (sex ratio of 0.16) [6], and by 2016, the hospital prevalence of thyroid dysfunction had reached 10.6%, with 87.9% of cases occurring in women [7].

However, the most recent local data are now over a decade old. Given the dynamic nature of disease epidemiology and the critical need for current information to guide clinical practice and resource allocation, there is a clear imperative to update the epidemiological profile of thyroid disorders in this setting. This study was therefore undertaken to provide contemporary data on the frequency and distribution of thyroid dysfunction within the Internal Medicine Department of Point G University Hospital.

2. Methods

2.1. Study Design and Setting

We conducted a descriptive study within the Internal Medicine Department of

Point G University Hospital, employing a descriptive transversal design using retrospective and prospective data. The retrospective data encompassed a review of medical records from January 1, 2016, to February 29, 2020. This was supplemented by a prospective survey conducted over 10 months from March 1 to December 31, 2020, bringing the total study duration to five years.

The inclusion criteria consisted of hospitalized or outpatient patients, regardless of age, sex, ethnicity, or geographic origin, who had been diagnosed with thyroid dysfunction through clinical and paraclinical examinations.

Exclusion criteria included patients with clinical signs of thyroid dysfunction who did not undergo further confirmatory testing, or whose paraclinical assessments were normal.

Statistical analyses were performed using Pearson's chi-squared test, Yates' chi-squared test, and Fisher's exact test, with a significance threshold of $p \leq 0.05$.

2.2. Participants and Variables

The study population comprised all patients hospitalized or followed in the outpatient clinics with a formally established diagnosis of dysthyroidism or thyroid dysfunction, based on consistent clinical and paraclinical evidence. Data were systematically extracted onto a pre-designed survey form, which captured variables including sociodemographic profile, clinical signs, complications, treatment modalities, and outcomes during follow-up.

2.3. Ethical Approval

The study was conducted in accordance with ethical standards for research. Patient confidentiality was rigorously maintained through the anonymization of all collected data, thereby eliminating any risk of personal information disclosure.

3. Results

3.1. Prevalence and Demographic Characteristics

During the five-year study period, 8516 patients were managed in the Internal Medicine Department. Among these, 337 patients were diagnosed with thyroid dysfunction, yielding a hospital frequency of 3.95%. Hyperthyroidism was the predominant dysfunction, comprising 277 cases (82.2%, frequency of 3.25%), while hypothyroidism was diagnosed in 60 patients (17.8%, frequency of 0.70%).

The cohort demonstrated a significant female predominance, with women accounting for 82.2% of cases (sex ratio of 0.22). The mean age was 43.74 ± 15.14 years, with a range from 10 to 90 years. The 41- to 60-year age group was the most represented, constituting 48.1% of the study population. Geographically, most patients (72.1%) resided within the Bamako district.

3.2. Clinical Presentation and Diagnostic Context

The most common circumstance leading to diagnosis was the presence of a goiter (28.2%), followed by clinical signs suggesting hyperthyroidism (21.4%) or hypo-

thyroidism (5.6%). Of patients, 82.8% were managed in an outpatient setting.

3.3. Characteristics of Hyperthyroidism

Among hyperthyroid patients, the most frequently reported clinical sign was palpitations (56.1%, Figure 1). Physical examination of the neck, performed in 63.2% of patients, identified a goiter in 68.1% of those examined (Figure 2). Tachycardia and heart murmurs were observed in 8.5% and 5.2% of patients, respectively.

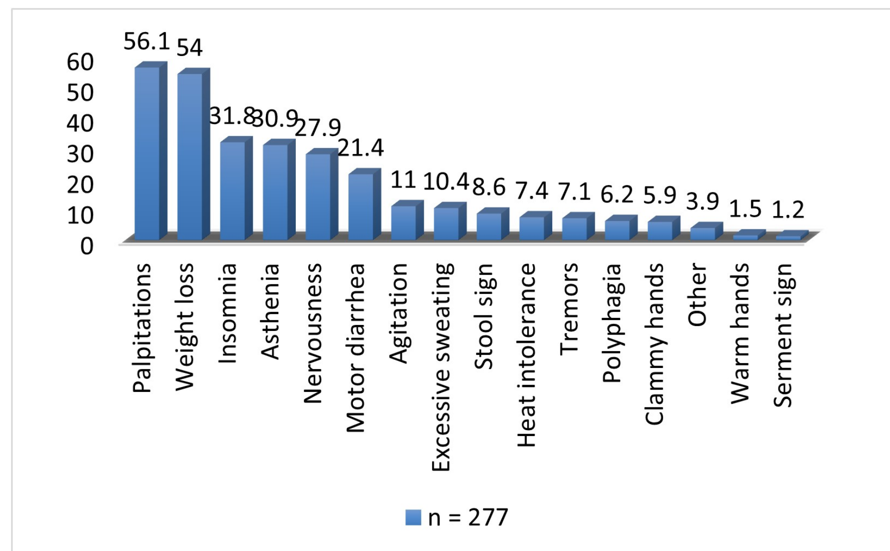

Figure 1. Distribution of patients according to clinical signs of hyperthyroidism.

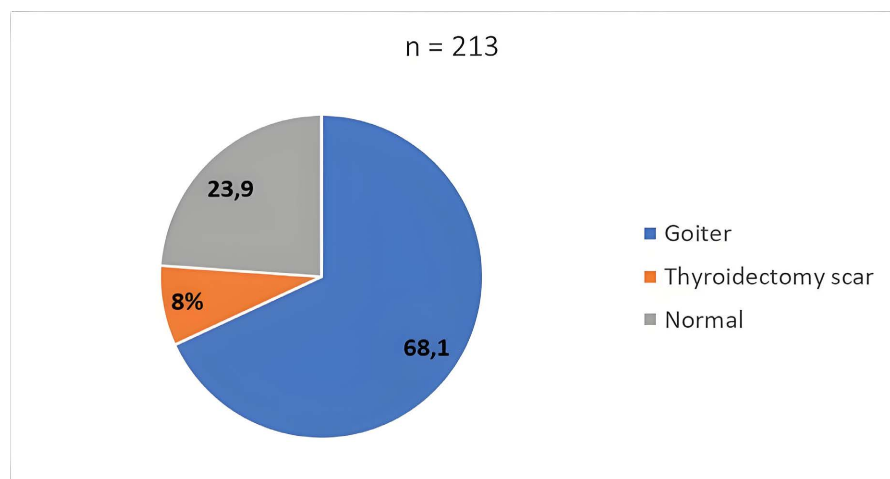

Figure 2. Distribution of patients according to the results of the physical examination of the neck.

Biochemically, a low TSHus (ultrasensitive thyrotropin hormone) level was universal (100%), and elevated FT4 was present in 78.9% of cases (see Table 1). Anti-TSH receptor antibodies were positive in 82.7% of the tested patients. Ancillary investigations revealed anemia in 35.02% of the 257 patients who underwent a complete blood count. Among other inflammatory markers, 50% of pa-

tients had an accelerated erythrocyte sedimentation rate, and 52.3% had an elevated C-reactive protein level. Thyroid ultrasound identified a multinodular goiter in 36.21% of cases (Table 2). The most common etiology was Graves' disease, accounting for 24.9% of hyperthyroidism cases. The primary complication was cardiothyreosis. Treatment involved synthetic antithyroid drugs in 98.92% of cases.

Table 1. Distribution of patients according to thyroid hormone abnormalities.

Paraclinical signs		Effective (n = 337)	Frequency (%)
TSHus	**Low**	**277**	**82.20**
	High	60	17.80
FT4	Low	59	17.51
	High	**266**	**78.93**
	Normal	**12**	**3.56**

Table 2. Distribution of patients according to the results of thyroid ultrasound.

Thyroid ultrasound results	Number (n = 174)	Frequency (%)
Multinodular goiter	63	36.21
Hyper vascularized	37	21.26
Uni nodular goiter	28	16.09
Diffuse goiter	23	13.22
Normal	18	10.34
Calcified	18	10.34
Others*	11	6.32

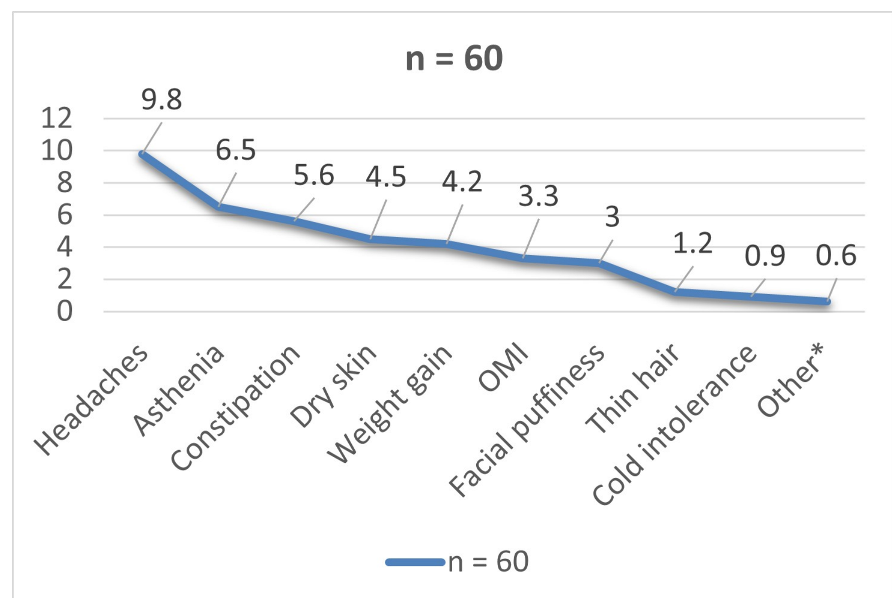

Figure 3. Distribution of patients according to the clinical signs of hypothyroidism.

3.4. Characteristics of Hypothyroidism

The leading clinical sign reported among hypothyroid patients was headache (9.8%, Figure 3). The diagnosis was confirmed biochemically by an elevated TSH us in 100% of patients, with 17.5% also exhibiting a low FT4 level (Table 1). Anti-thyroperoxidase (TPO) antibodies were elevated in 46.7% of cases, while anti-thyroglobulin antibodies were positive in 2.14%. The most frequent etiology identified was iatrogenic, with hypothyroidism after a thyroidectomy accounting for 30% of cases (Table 3). Treatment with thyroid hormone replacement (levothyroxine) was initiated in 98.33% of patients, resulting in a favorable outcome in 78.93% of cases.

Table 3. Distribution of patients according to the etiology of thyroid dysfunction.

Etiologies	Number (n = 337)	Frequency (%)
Hyperthyroidism	**n = 277**	
Graves' disease	69	24.9
Toxic multinodular goiter	22	7.9
Toxic nodular goiter	12	4.3
Thyroiditis	19	6.9
Drug (levothyroxine)	3	1.1
Post-amiodarone	1	0.4
Cause not found	151	54.5
Hypothyroidism	**n = 60**	
Iatrogenic (thyroidectomy)	18	30
Drug (carbimazole)	6	10
Thyroiditis	3	5
Cause not found	33	55

4. Discussion

This study provides a contemporary analysis of the frequency and clinical characteristics of thyroid dysfunction in a tertiary care setting in Mali. The principal finding is a hospital frequency of 3.95%, which aligns closely with the 3.82% reported by Garmendia *et al.* [8], underscoring a consistent burden of thyroid disorders in similar clinical environments.

4.1. Demographic and Clinical Profile

The demographic profile of our cohort, with a mean age of 43.74 years and a striking female predominance (82.2%, sex ratio 0.22), is consistent with the well-established epidemiology of thyroid disease [2] [5] [7]. The high prevalence of hyperthyroidism (82.2%) over hypothyroidism (17.8%) in our setting warrants attention. The clinical presentation was classic, with palpitations, weight loss, and insomnia being the most frequent symptoms of hyperthyroidism, while hypothy-

roid patients commonly presented with headaches and asthenia. The low rate of subclinical thyroid dysfunction (3.56%) likely reflects a selection bias, where only symptomatic patients or those with obvious goiter seek care in a tertiary center.

4.2. Diagnostic and Etiological Findings

The diagnostic workup confirmed the utility of TSH and FT4, with 100% of hypothyroid patients showing elevated levels. The high prevalence of anemia (35.02%) among tested patients highlights a common systemic complication of both hyper- and hypothyroidism.

Ultrasound and cytological findings revealed a high burden of structural disease. Multinodular goiter was the most common ultrasound finding (36.21%), a finding supported by Emani *et al.* [8]. The discrepancy between our rate of thyroid vesicular adenoma on cytology (27.78%) and the higher rate (52.04%) found by Darre *et al.* [9] may be attributed to differences in patient selection or the small subset of our cohort that underwent fine-needle aspiration (**Table 4**).

Table 4. Distribution of patients according to the etiology of thyroid dysfunction.

FNA and Anapath	Number of employees (n = 18)	Frequency (%)
Thyroid gallbladder adenoma	5	27.78
Remodelled goiter	4	22.22
Colloidal goiter	4	22.22
Benign nodule	4	22.22
Suspicion of malignancy	1	5.56

Regarding etiology, Graves' disease was the most common cause among the identified causes, which is consistent with reports from other regions [10] [11]. A significant proportion of hypothyroidism (30%) was iatrogenic, resulting from thyroidectomy, pointing to the long-term consequences of surgical management for goiter or thyroid nodules.

4.3. Complications and Management

Cardiothyreosis was the most significant complication, affecting 11.2% of hyperthyroid and 8.3% of hypothyroid patients, confirming the findings of Sidibé [12], Koffi [13], and Abid [14]. This underscores the critical need for timely diagnosis and treatment to prevent cardiac sequelae.

Therapeutic practices were largely aligned with international guidelines. Antithyroid drugs (ATS) were the cornerstone of hyperthyroidism management (98.92%), with beta-blockers used supportively in 43.68% of cases for symptomatic relief. For hypothyroidism, levothyroxine was used in most cases (98.33%).

4.4. Limitations

This study has limitations, primarily inherent to its hybrid design with backward

and forward data collection, with missing data. A significant constraint was the presence of missing data, both in physical examination records and in the completion of essential paraclinical investigations—such as autoantibody assays, thyroid scintigraphy, and ultrasound—which are critical for a comprehensive etiological diagnosis. Furthermore, patient attrition due to non-adherence to follow-up appointments or transfer of care to other facilities limited our ability to assess the longitudinal progression of the disease and long-term outcomes.

The retrospective component of the data collection directly contributed to the incompleteness of some patient files. While these factors collectively reduced the effective sample size for specific analyses, the overall large cohort size mitigates their impact on the general validity of the primary findings. Despite these limitations, this study provides a valuable and representative overview of the clinical profile and management of thyroid dysfunction within the context of an Internal Medicine department.

5. Conclusion

The findings of this study delineate thyroid dysfunction as a condition of significant clinical and public health importance. Characterized by a polymorphic presentation and a strong female predominance in mid-life, the disease burden is largely driven by Graves' disease and iatrogenic hypothyroidism following thyroidectomy. The optimal management paradigm involves coordinated, multidisciplinary care. However, within a framework of constrained healthcare resources, a strategic reorientation towards primary prevention and secondary screening is imperative. Enhancing early diagnostic capabilities and facilitating unimpeded access to treatment are not merely beneficial but essential public health objectives to reduce the long-term morbidity and complications associated with this prevalent endocrine disorder.

Conflicts of Interest

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

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