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Overview of Thyroid Disorders in Pikine National Hospital Center: A 10-Year Retrospective Study

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Abstract

Introduction: Thyroid diseases are common in our region. Their etiologies are diverse and can be classified into two major categories: functional disorders (hyperthyroidism and hypothyroidism) and structural abnormalities (nodules, goiter, and cancer). We conducted this study to assess the epidemiological and diagnostic profiles of thyroid diseases in our hospital. **Methodology:** This was a retrospective and descriptive study conducted over a 10-year period, from January 2009 to December 2019. A total of 920 patients diagnosed with thyroid disorders and followed at the Pikine National Hospital Center were included. **Results:** The mean age of the patients was 44 years, with ages ranging from 1 to 100 years. The highest incidence was observed in the 21 - 40-year age group. The female-to-male ratio was 7.7:1 (sex ratio, 0.13). Functional thyroid disorders were the most common indication for follow-up: hyperthyroidism accounted for 44.56% of cases, while hypothyroidism accounted for 35.87%. Among those with hyperthyroidism, thyrotoxic syndrome was present in 330 patients (81%), with Graves' disease being the most frequent cause, responsible for 59% of hyperthyroidism cases. Hashimoto's thyroiditis was the leading cause of hypothyroidism, found in 137 patients (41.51%), followed by post-thyroidectomy hypothyroidism, observed in 88 patients (26.66%). Structural thyroid diseases were mainly composed of thyroid nodules, followed by simple goiter and, less frequently, thyroid cancer. **Conclusion:** Thyroid disorders are frequent and have varied etiologies. Identifying the underlying cause is essential for effective management. Understanding the current epidemiological trends will facilitate future evaluations and healthcare planning.

Keywords

Thyroid Dysfunctions, Hyperthyroidism, Hypothyroidism, Thyroid Nodule, Goiter, Senegal

1. Introduction

Thyroid disorders represent a significant public health concern worldwide, particularly in developing regions. In Sub-Saharan Africa, including our region, these conditions are frequently encountered in clinical practice. Their etiologies are diverse and can be broadly classified into two major categories: functional disorders—namely, hyperthyroidism and hypothyroidism—and structural pathologies, such as benign nodules, goiter, and thyroid cancer.

The high prevalence of thyroid disease in African populations is largely attributed to environmental and nutritional factors, especially iodine intake. Iodine deficiency, long known as a major cause of endemic goiter, has seen a progressive decline due to improved public health interventions, including iodized salt programs. Consequently, there has been a noticeable shift in thyroid disease patterns, with a relative increase in cases of hyperthyroidism and hypothyroidism, replacing what was once the predominance of endemic goiter [1]-[4].

Despite the clinical importance of thyroid disorders, local data regarding their epidemiological and diagnostic characteristics remain limited, particularly in newly established endocrinology departments. Given the emerging nature of the endocrinology specialty in our country and the central role of the thyroid in endocrine function, it is crucial to establish baseline knowledge for future planning and management.

The objective of this study was to describe the epidemiological and diagnostic profiles of thyroid diseases in patients being followed in the Endocrinology, Diabetology, and Nutrition Department of the Pikine National Hospital Center.

2. Patients and Methods

2.1. Study Setting

This study was conducted in the Department of Internal Medicine/Endocrinology, Diabetology, and Nutrition at the Pikine National Hospital in Dakar, Senegal. This department is the only Endocrinology-Diabetology-Nutrition unit in the country and was officially established in 2019, following the introduction of the Specialized Study Diploma in Endocrinology in Senegal.

2.2. Study Design and Population

We performed a retrospective, descriptive, and analytical study. All patients with thyroid disease who were followed in the department during the study period were included. Data were collected from patients' medical records using a standardized,

pre-established questionnaire.

2.3. Inclusion Criteria

- Patients were followed in the Endocrinology Department for any thyroid-related condition.
- Availability of complete medical records.

2.4. Exclusion Criteria

- Incomplete medical files.
- Unconfirmed or uncertain thyroid diagnoses.

2.5. Data Collection

Information was extracted using a structured questionnaire that included the following variables:

- Sociodemographic data: age, sex, and year of diagnosis.
- Medical history:
  - Personal history: thyroid surgery; presence of autoimmune or endocrine diseases; use of medications associated with thyroid dysfunction; comorbidities such as diabetes or hypertension.
  - Family history: family members with thyroid disorders (hypothyroidism, hyperthyroidism, nodules, thyroid cancer, etc.) or with other hereditary diseases.
- Clinical parameters:
  - Circumstances of diagnosis.
  - Signs of hyperthyroidism (e.g., weight loss, palpitations).
  - Signs of hypothyroidism (e.g., fatigue, weight gain).
  - Presence of goiter or exophthalmos.
- Paraclinical data:
  - Hormonal assays: TSH, free T4, free T3.
  - Immunological markers: anti-TPO, anti-TSH receptor antibodies (TRAb), anti-thyroglobulin antibodies.
- Etiological classification:
  - Hyperthyroidism: Graves' disease, toxic multinodular goiter, toxic adenoma, subacute thyroiditis (De Quervain), etc.
  - Hypothyroidism: Hashimoto's thyroiditis, post-thyroidectomy hypothyroidism, postpartum thyroiditis, etc.
  - Structural disorders: simple goiter, benign thyroid nodules, and thyroid cancer.

3. Data Analysis

Data were entered and analyzed using Sphinx software version 2017 and Microsoft Excel. Descriptive and analytical statistical methods were applied according to the variable type.

4. Results

During the study period, we reviewed 1181 patient files with thyroid disease out of a total of 7279 files from hospitalizations and outpatient consultations, representing a hospital prevalence of 16.22%. Of these, 920 patients met the inclusion criteria for our study.

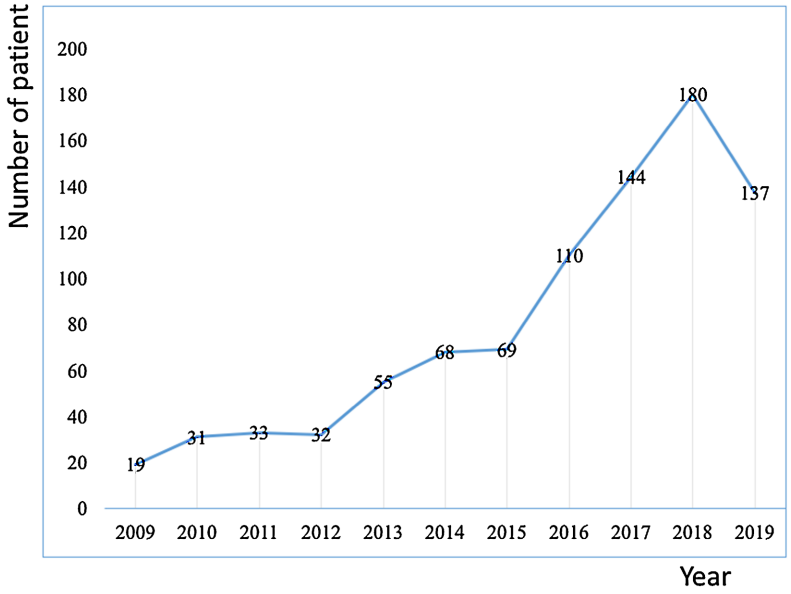

Figure 1. Age distribution.

Age distribution: The average age of patients was 44 years, ranging from 1 to 100 years. The highest incidence was observed in the 21 - 40-year age group (40.87%), followed closely by the 41 - 60-year age group (39.46%) (**Figure 1**).

Sex distribution: Thyroid diseases predominantly affected females, with a female-to-male sex ratio of approximately 7.7:1 (sex ratio = 0.13).

Etiological distribution: Dysthyroidism was the leading cause of patient follow-up, comprising 44.56% with hyperthyroidism and 35.87% with hypothyroidism. Structural thyroid damage was mainly due to benign nodules, found in 13.15% of patients.

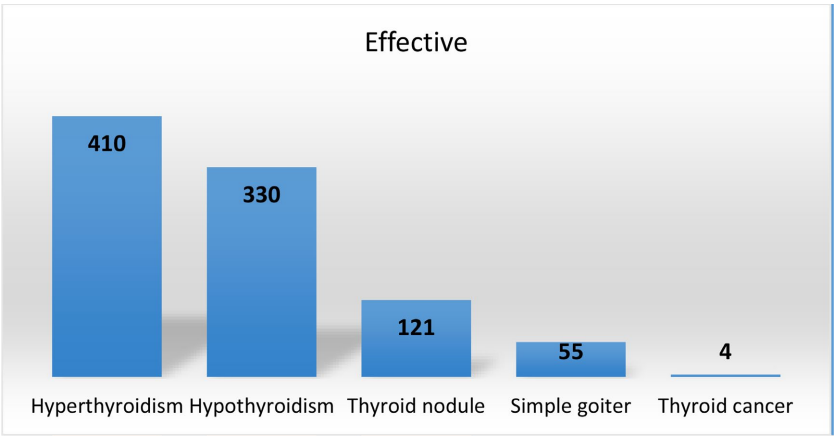

Figure 2. Distribution of patients according to thyroid pathology.

Hyperthyroidism

Symptoms: Thyrotoxicosis syndrome was present in 330 patients (81% of those with hyperthyroidism). The most common symptom was weight loss, reported in 23.65% of patients, followed by palpitations and sleep disorders. Exophthalmos was observed in 27.56% of hyperthyroid patients (Figure 2).

Table 1. Distribution of clinical signs of thyrotoxicosis.

Symptoms	Effective
Exophthalmos	113
Weight loss	97
Palpitations	55
Tachycardia	43
Sleeping troubles	42
Mood desorder	17
Asthenia	10
Tremors	10
Thermo phobia	4
Muscular weakness	3
Hypersweating	3
Diarrhea	2
Polydipsia	2

Thyroid Hormone Dosage: TSH levels were decreased in 408 hyperthyroid patients, while only 2 patients showed elevated TSH levels. T4 levels were normal in 55 patients (Table 1).

- Immunology: Immunological testing was performed in 29% of hyperthyroid patients, primarily measuring anti-TSH receptor antibodies in 96% of those tested.
- Etiological Diagnosis: Graves' disease was the most common cause of hyperthyroidism, accounting for 26.41% of all thyroid pathologies and 59% of hyperthyroidism cases. It was followed by toxic heteromultinodular goiter, which represented 26% of hyperthyroidism etiologies. The following table provides a detailed distribution of these causes.

Hypothyroidism

Diagnostic Circumstances: As shown in the table below, hypothyroidism was most often diagnosed based on clinical signs of hypometabolic syndrome (Table 2).

Clinical Signs: Clinical signs of hypometabolism syndrome were rarely detailed in patient files (Table 3).

Thyroid Hormone Assessment: TSH testing was performed in 98% of patients with hypothyroidism. It was elevated in 85% of patients and was low in 2%.

Immunology: Anti-thyroid antibodies were tested in 45% of patients, primarily anti-thyroperoxidase (anti-TPO) antibodies, which accounted for 91% of the antibody tests performed.

Etiological Diagnosis: Hashimoto's disease was the most frequent cause of hypothyroidism, affecting 137 patients (41.51% of hypothyroidism cases), followed by post-thyroidectomy hypothyroidism, which affected 88 patients (26.66%). The etiological distribution is summarized in the following table.

Table 2. Etiological distribution of hyperthyroidism.

Hyperthyroidism causes	Effective
Grave desease	243
Heteromultinodular goiter	107
De Quervain subacute thyroiditis	10
Toxic adenoma	7
Hyperthyroidism elevated TSH	2
Undetermined	41

Table 3. Circumstances of hypothyroidism diagnosis.

Circumstances of discovery	Number of patients
Signs of hypometabolism	61
Goiter	7
Myxedematous coma	1
Systematic screening	2

Table 4. Etiological distribution of hypothyroidism.

Etiology	Number of patients	Percentage (%)
Hashimoto's disease	137	41.51
Post-thyroidectomy	88	26.66
Central hypothyroidism	5	1.52
Atrophic thyroiditis	10	3.03
Hormone synthesis disorders	2	0.61
Undetermined causes	88	26.66

Simple Goiter

Mean Age and Sex Ratio: The mean age of patients with simple goiter was 44 years, ranging from 29 to 61 years. Females were predominantly affected, with a sex ratio of 0.15 (Table 4).

Diagnostic Circumstances: In all cases, the diagnosis was made following the appearance of a goiter.

Biology: Thyroid hormone levels were normal in all patients. Immunological testing, performed in 16 patients, was also within normal limits.

Benign Thyroid Nodule

Mean Age and Sex Ratio: The mean age of patients with benign nodules was 43 years, with a range of 5 - 80 years. As illustrated in the following figure, the majority of patients were female, with a sex ratio of 0.09.

Diagnostic Circumstances: Thyroid nodules were diagnosed based on functional symptoms in 69% of patients, while ultrasound imaging detected nodules in 8% of cases.

Biology: Thyroid hormone profiles were normal in all patients.

Thyroid Cancer

Mean Age and Sex Ratio: In our study, 4 patients were diagnosed with thyroid cancer. The mean age was 36 years. Medullary thyroid carcinoma was identified in 2 patients, while 1 patient had papillary thyroid carcinoma and another had anaplastic thyroid carcinoma.

5. Discussion

Patients' ages ranged from 1 to 100 years, with the highest incidence observed between 21 and 40 years (40.87%). The mean age in our study was 44 years. This is comparable to a recent study from Côte d'Ivoire, which reported a mean age of 40 years and a peak incidence between 31 and 65 years [1]. Similarly, a retrospective study conducted in Saint-Louis, Senegal, involving 81 patients treated for goiter, found a mean age of 40 years, with ages ranging from 11 to 85 years. Our findings align with existing literature, which indicates that thyroid pathologies are most prevalent in the 40- to 50-year age group.

Females were clearly predominant in our study, comprising 88.15% of patients, resulting in a male-to-female sex ratio of 0.13. This female predominance in dysthyroidism has been recognized since 1977, when the British Whickham study estimated the incidence of hyperthyroidism at 100 to 200 cases per 100,000 individuals per year, with a prevalence of 2.7% in women compared with 0.23% in men. A 20-year follow-up of the Whickham cohort reported a sustained incidence of 80 cases per 100,000 women annually.

In the United States, the 2002 National Health and Nutrition Examination Survey (NHANES III) found overt hyperthyroidism in 0.5% of the general population and subclinical hyperthyroidism in 0.7%, yielding an overall prevalence of 1.3% [5] [6]. In Africa, data on the general population are lacking, and hospital-based cohorts do not fully represent the general population, especially those in rural areas. However, a study conducted in Côte d'Ivoire reported a female predominance of 86.8% in its cohort [1]. Similarly, a study by Diatou *et al.* in Senegal found a sex ratio of 0.05 [6].

The marked female predominance in thyroid diseases is attributed to complex etiopathogenic mechanisms involving hormonal factors—particularly estrogen—and autoimmune processes [7].

The most frequent manifestation of dysthyroidism in our study was goiter, observed in 50% of patients. This was typically a homogeneous, vascular goiter, indicative of hyperthyroidism—the primary cause of dysthyroidism in our cohort. Globally, the prevalence of goiter is high, affecting approximately 2.2 billion people, with an estimated prevalence of 15% [8]-[10]. In our study, the goiter was often homogeneous and vascular. A thesis conducted in Senegal involving 150 patients with hyperthyroidism reported goiter in 94 patients (87%), with vascularity present in 45.7% of cases. In Western countries, goiter prevalence is also substantial; for example, it was estimated at 80.8% in France and reported at 100% by Larsen in the United States.

In our study, weight loss and palpitations were the most frequently observed clinical signs of thyrotoxicosis syndrome. These findings are consistent with a thesis conducted at the Internal Medicine Department of Aristide Le Dantec Hospital, in which palpitations and weight loss were the predominant clinical signs in 150 cases of hyperthyroidism.

Asthenia was reported in 18.5% of our patients, compared to 8.5% in the study by InDRAME B *et al*. Meanwhile, a 1996 study conducted in Dakar by SIDIBE EH *et al*., which included 37 patients, found asthenia in 40% of cases [11] [12]. Asthenia appears to be the most frequent functional symptom in hypothyroidism; however, many cases remain asymptomatic. Indeed, the majority of hypothyroid patients are diagnosed through biochemical screening (TSH assay) or incidentally following treatments such as surgery or radioiodine therapy, where hypothyroidism is anticipated.

Regarding thyroid function tests, free T3 was rarely measured in our study, while TSH was almost always assessed. TSH remains the first-line investigation in thyroid pathology, usually followed by free T4 determination. The measurement of free T3, which was seldom requested in our study, has limited clinical utility and is reserved for specific situations.

Hashimoto's disease was the leading cause of hypothyroidism in our cohort, accounting for 137 patients (41.51%), followed by post-thyroidectomy hypothyroidism in 88 patients (26.66%). These results align with the findings of SIMONIN *et al*. in France, who also reported Hashimoto's thyroiditis as the predominant cause. Conversely, a study in Côte d'Ivoire by ABODO *et al*. found post-thyroidectomy hypothyroidism to be more prevalent, while in Senegal, Sidibé *et al*. implicated atrophic thyroiditis more frequently than hypothyroidism itself. These discrepancies may be influenced by the frequency and availability of antibody testing in different studies [1] [13] [14].

Thyroid nodules were the most commonly detected structural abnormality, representing 13.26% of all thyroid pathologies in our study. Four cases of thyroid cancer were documented. Endemic euthyroid goiter accounted for 5.98% of thyroid diseases. These findings are consistent with reports in the general population, where benign thyroid nodules are present in 4% to 7% of individuals, rising to 20% in ultrasound and autopsy studies. Notably, our study recorded a low preva-

lence of endemic goiters, which are generally considered the most common form of dysthyroidism. This may be explained by the urban setting of our study population and the current iodine supplementation programs in our country [15] [16].

Thyroid nodules were most frequently detected by palpation, although ultrasound is increasingly used due to its higher sensitivity and its ability to classify nodules.

The incidence of thyroid cancer in our study was low, most likely due to the direct referral of patients to specialized departments, particularly Otolaryngology, and in some cases, the absence of histopathological examination following thyroidectomy.

Our study is a retrospective, single-center, hospital-based design, which is a significant limitation that might affect the generalizability of the findings to the broader Senegalese population.

6. Conclusion

This ten-year review highlights the spectrum of thyroid disorders in our endocrinology department and emphasizes the value of etiological investigation. In our setting, limited access to healthcare and diagnostic tools remains a key barrier, contributing to delayed diagnosis and management. Enhancing diagnostic capacities and accessibility is crucial to improving patient care and informing public health strategies.

Conflicts of Interest

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

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