

Diagnostic Itinerary of Patients Monitored for Thyroid Disease at the Conakry University Hospital in 2022

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Abstract

Introduction: Thyroid pathologies are either the cause or a consequence of certain pathologies with which they interact, manifesting themselves through a polymorphic and non-specific clinic. They affect different devices and/or systems, making the clinical picture more complex or even a delay in diagnosis and treatment. These latter aspects, being then multidimensional, could be preceded by a very specific patient itinerary for the diagnosis and management of cases of thyroid gland pathologies. **Methods:** This was a descriptive cross-sectional study whose data were collected from May 1 to October 30, 2022. It focused on patients followed for thyroid diseases at the Conakry University Hospital. The objectives were to describe the patient's journey before their diagnosis of thyroid disease. **Results:** The subjects were 86.1% women with a mean age of 43.7 ± 28 years. Of the total, 67.85% had a comorbidity including diabetes and/or hypertension/heart disease. They are followed for goiters/simple nodules (22.78%), hypothyroidism (16.46%) and hyperthyroidism (60.76%). They spend at least 9 months before resorting to a healthcare facility. The general medicine services of the Conakry University Hospital are the first recourse (51.9%) of these subjects. They consult 2 to 4 times before the diagnosis is suggested. Hyperthyroidism, hypothyroidism and goiters/simple nodules spend 5.4; 6.4 and 13.7 months respectively before the diagnosis is made. 31.6% were hospitalized and treated mainly for malaria (19.0%), hypertension (13.1%), salmonellosis (13.1%) and diabetes (8.3%). A third of patients used traditional

therapy before being in contact with the endocrinology department by referral (73.4%). **Conclusion:** This study made it possible to show a pre-diagnostic pathway which has a particular character concerning patients followed for thyroid pathologies in Guinea.

Keywords

Itinerary, Diagnosis, Thyroid, Conakry

1. Introduction

Recognizing diseases by their symptoms, signs and distinguishing them from each other is called diagnosis [1]. In the case of certain rare or little-known diseases, the patient is a victim of medical wandering and psychological suffering, the fact that he goes from department to department without a diagnosis being made and therefore not being taken care of in a timely manner, these conditions make it difficult for the patient to be understood by the medical profession and social services [2].

Clinical manifestations in the early stages of disease progression rarely represent a complete picture of a disease. Thyroid diseases can present with different profiles of thyroid function, *i.e.* hyperthyroidism, euthyroidism or hypothyroidism [3]. Health professionals (general practitioners and paramedics) who are the first contacts with patients have limited diagnostic means. Seventy percent (70%) of their consultations concern pictures not characteristic of a disease [4]; situations in which they are required to decide in a relatively short time. Diagnostic uncertainty is omnipresent in general medicine [5], some situations can be complex and cause stress for both the doctor and the patient.

Thyroid diseases are either the cause or a consequence of certain pathologies with which they interact, manifesting themselves through a polymorphic and non-specific clinic. Links between thyroid diseases and psychological symptoms are described [6]; thyroid dysfunction can therefore affect different devices and/or systems [7]-[9], making the clinical picture more complex or even a delay in diagnosis and management. These latter aspects, being then multidimensional, could be preceded by a very particular patient itinerary for the diagnosis and management of cases of thyroid gland pathologies.

At the end of the consultations, primary care providers (general practitioners and paramedical staff) are unable to be certain about the etiology of the situation and/or its development into an illness. They can only arrive at a diagnosis of illness in 30% of cases [4]. The level of information of the physician on the signs and symptoms of thyroid diseases, the availability and accessibility of diagnostic means and techniques could be pejorative factors of the reality of the lack of rapid access to diagnosis and the relative consequences suffered by thyroid patients.

The aim of this study was to describe the patient's journey before the diagnosis

of their thyroid disease.

2. Methods

This was a cross-sectional, qualitative descriptive study whose data collection lasted 6 (six) months from May 1 to October 30, 2022. It was carried out at the endocrinology outpatient clinic of the Donka University Hospital.

- **Inclusion criteria:** All patients who gave their consent, with thyroid disease followed in the departments, admitted for outpatient consultation or seen at the site by appointment, and who agreed to the interview were included in this study.
- **Non-inclusion criteria:** The non-inclusion criterion for this study was the non-consent of patients to participate and those who did not have a complete file.

To ensure the reliability of the data, the information was collected on physical papers before entering them into the analysis software. To do this, the investigator first checks the patient's availability to be interviewed, then checks the patient's follow-up file to ensure that the information to be collected is correctly noted. This information refers to the dates of previous consultations, the reasons for these consultations, the diagnoses mentioned as well as the examinations carried out. The survey sheets were reread, dated and signed before releasing the patient.

The study variables were:

- **Reasons for consultation before diagnosis:** These are the symptoms for which the patient first consulted before the diagnosis was made,
- **The duration of the symptoms before contacting the service:** Period from the onset of symptoms to the first contact with the current monitoring service,
- **The place of consultation before the diagnosis:** This is the 1st, 2nd or 3rd level health structure that the patient consulted before being registered in the current monitoring service. This may be the indigent,
- **The number of consultations carried out before diagnosis:** This is the sum of medical visits made for symptoms of the disease before its diagnosis,
- **Services consulted before the diagnosis:** This is the number of services consulted at least once before the diagnosis of thyroid pathology is made,
- **The number of hospitalizations carried out before contact with the service:** This is the sum of hospitalizations carried out for symptoms of the disease before its diagnosis,
- **Specific examinations carried out before contacting the service:** This is the set of tests carried out in relation to thyroid dysthyroidism before being received in the current follow-up service. These tests considered here are the thyroid hormone assessment, thyroid imaging, inflammatory and immunological assessment of the thyroid,
- **The diagnosis mentioned/treated before contact with the service:** This is the disease that is supposed to cause the symptoms for which the patient consulted before being followed up in the current follow-up service,

- **The mechanism for contacting the current tracking service:** This is the channel through which the patient became aware of the service or was in contact with it,

Data entry and analysis were done using Epi-info.7 software. Cross-analyses were then performed between positive diagnoses and certain variables studied to better describe the results and compare them with data from the literature.

Patients' agreement and free and informed verbal consent were obtained on the day of the survey before the administration of the questionnaire. Data confidentiality is ensured by anonymity during data processing and analysis.

3. Boundaries

The failure to include in our survey sheet some potential confounding factors such as the exact individual income of the participants, the socio-economic status of the patient, health literacy. The analysis of these factors could have a contribution to the diagnostic delay.

4. Results

In this study, men represented 24%, giving a sex ratio of women to men = 6.18. The average age of our patients was 43.7 ± 28 years. Twenty-point three percent (20.3%) of the subjects included in this study lived in the interior of the country, of which 10.1% lived in rural areas. Educated persons represented 73.4%; 40% had no income-generating activity, 22.8% exercised a trade or small business, 27.8% were employees. Two (2) out of 10 women recruited during our surveys were housewives.

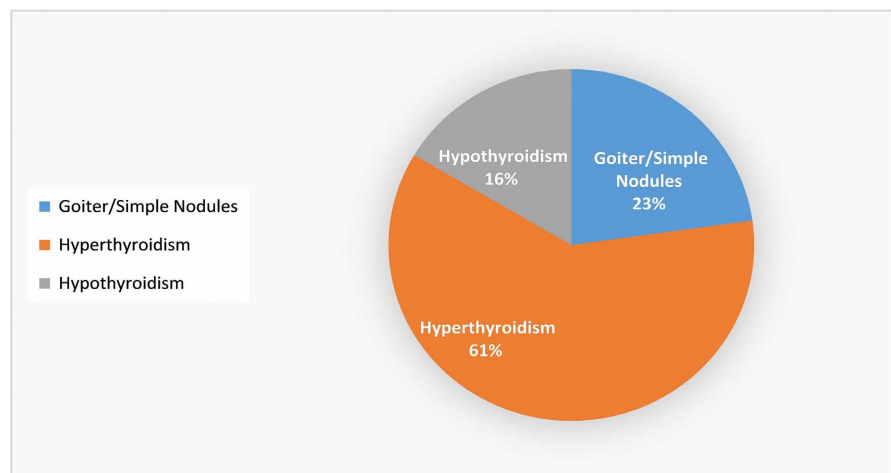


Figure 1. Distribution of cases of dysthyroidism.

We observed three varieties of diagnosis for which patients were followed; these were goiters/simple nodules (22.78%), hypothyroidism (16.46%) and hyperthyroidism (60.76%). Half (48.1%) of the participants had a comorbidity including diabetes and heart disease/high blood pressure (HBP) with respective proportions

of 22.8% and 25.3%.

The consultations were motivated either by signs of compression (6.3%), signs of hypothyroidism (8.9%), signs of hyperthyroidism (60.4%) and goiter (36.7%).

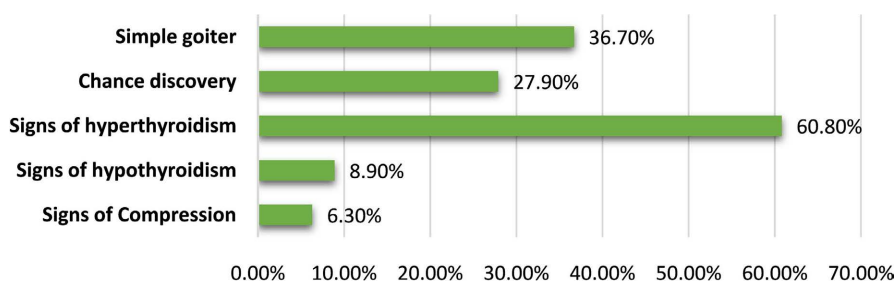


Figure 2. Reasons for consultation.

Table 1. Average number of consultations performed and average time from onset of symptoms to diagnosis by type of thyroid disease.

Thyroid Disease	Effective N = 79	Average time in months*between the onset of symptoms and the first consultation	Average number of consultations before diagnosis	Average time in months*between the first consultation and the diagnosis
Goiter/Simple Nodules	18	36 ± 65.4	2.5 ± 2.6	6.4 ± 13.0
Hyperthyroidism	48	16 ± 27.2	4.1 ± 3.6	5.4 ± 13.4
Hypothyroidism	13	9 ± 9.7	2.2 ± 1.5	13.7 ± 23.7

*1 month = 30 days.

On average, carriers of goiters/simple nodules, hyperthyroidism and hypothyroidism wait 36, 16 and 9 months respectively before proceeding to a first medical consultation. The average delay between the first medical consultation and the diagnosis of thyroid disease is 5.4 ± 13.0 months for hyperthyroidism; 6.4 ± 13.4 months for hypothyroidism and 13.7 ± 24.7 months for cases of simple goiters/nodules.

Table 2. Frequency of structures and services consulted before diagnosis.

Structures/Services	Effective	Percent
Structures consulted before diagnosis		
- CHU/National Hospital	25	31.7%
- Clinic/Medical office	22	27.9%
- CMC/CSA/Prefectural Hospital	1	1.3%
- CS/PS	1	1.3%
- Regional Hospital	6	7.6%
Services consulted before diagnosis		
- General medicine	41	51.9%

Continued

- Cardiology	9	11.4%
- Surgery	12	15.2%
- Pulmonology	3	3.8%
- ENT	5	6.3%
- Gynecology	2	2.5%
- Endocrinology	14	17.7%
- Primary health care	13	16.5%
- Don't know	4	5.1%

CMC: Communal medical center; CSA: Improved health center; CS: Health center; PS: Health post.

The University Hospital of Conakry was the most consulted structure (31.7%). In these places, the majority of patients (51.9%) consult in the general medicine, cardiology (11.4%), endocrinology (17.7%) and surgery (15.2%) departments.

Table 3. Number of hospitalized cases and use of traditional therapy before diagnosis by type of thyroid disease.

Thyroid Disease	Simple goiter/nodules n = 18	Hyperthyroidism n = 48	Hypothyroidism n = 13	Total n = 79
Concept of hospitalization				
<i>NO</i>	11 (61.1%)	35 (64.8%)	8 (61.5%)	54 (68.4%)
<i>YES</i>	7 (38.9%)	13 (52.0%)	5 (38.5%)	25 (31.6%)
Use of traditional therapy				
<i>NO</i>	16 (88.9%)	31 (64.6%)	11 (84.6%)	58 (73.4%)
<i>YES</i>	2 (11.1%)	17 (35.4%)	2 (15.4%)	21 (26.6%)

We total between 2 and 4 consultations carried out per patient before their illness was mentioned. The use of traditional therapy was observed in 26.6% of cases; 31.6% were hospitalized and treated for malaria (19.0%), HTA (13.1%), salmonellosis (13.1%) and diabetes (8.3%).

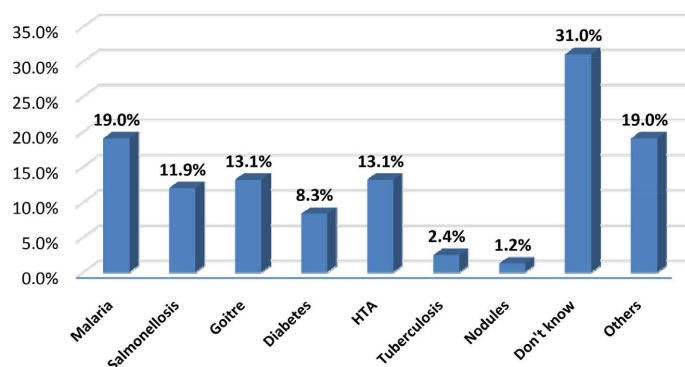


Figure 3. Diseases considered and treated before diagnosis of thyroid diseases.

Table 4. Contact mechanism with the current tracking service.

Contact mechanism	Effective, N = 79	Percent
Forgot	2	2.5%
Radio/Television	2	2.5%
Referred by a colleague	3	3.8%
Referred by a patient	12	15.2%
Referred by a Professional	58	73.4%
Come yourself	2	2.5%
Total	79	100%

Six mechanisms of contact with the service had been stated by patients. Cases referred by a health professional represented 73.4%.

Table 5. Specific tests carried out before contacting the service.

Type of exam	Effective	Percent
Thyroid Ac (TRAK, TPo, Tg)	3	3.80%
Anapath	2	2.53%
ECG	9	11.39%
Cervical CT Scan	2	2.53%
Cervical Echo	34	43.04%
TSH/T4L/T3L	55	69.62%

*Ac = Antibody; ECG = Electrocardiogram; CT = Brain computed tomography; TRAK = Anti-TSH Ac; TPo = Thyroperoxidase; Tg = Thyroglobulin.

The tests performed targeting the thyroid before the patient was referred to the endocrinology department were mainly TSH (69.7%), cervical ultrasound (43.0%) and ECG (11.4%).

5. Discussion

The data reported in this study are the first in Guinea regarding the diagnostic itinerary of patients followed for thyroid disease. We will discuss our results according to the sociodemographic profile, the clinical profile and the patient's journey before the diagnosis of thyroid disease.

❖ Sociodemographic profile

Referring to the mean age of our patients, they are similar to patients in other previous studies conducted in Guinea concerning thyroid disease. The mean age of our patients is 43.7 ± 28 years. Studies on thyroid patients conducted elsewhere in Africa have reported a similar mean age. In Guinea, A. KAKE and colleagues [10] [11] reported mean ages of 41.81 ± 14.25 years and 47 ± 16 years. There were few men in this study (24%) with a female/male sex ratio of 6.18. It is described in the literature that thyroid functional disorders are 10 times more common in

women than in men [12]. Two (2) out of 10 women recruited during our surveys are housewives.

Among the 20.3% of subjects included in this study living in the interior of the country, 10.1% lived in rural areas. This low proportion (10.1%) of patients seen for dysthyroidism who usually live in rural areas could be explained by the lack of geographical access to clinical and paraclinical diagnosis. This situation has the effect of underestimating the real extent of thyroid pathology in Guinea, especially in the interior of the country. However, in Guinea, the results of surveys carried out in the four natural regions, Upper Guinea, Middle Guinea, Forest Guinea and Lower Guinea show a prevalence of iodine deficiency at 70% [13]. As a result, our populations everywhere they live across the country are exposed to thyroid disorders to comparable degrees. The World Health Organization has also emphasized that the most common cause of thyroid disorders in the world is iodine deficiency [12]. Further, this global exposure could be explained by the fact that in our country, the main sources of iodine (fish and table salt) are most often supplied from the same local markets from the capital.

❖ Clinical features

Half (48.1%) of the participants had comorbidity including diabetes and heart disease/hypertension (HTA) with respective proportions of 22.8% and 25.3%. The association of thyroid dysfunction plus diabetes and thyroid dysfunction plus cardiovascular disease is described. In the same patient, diabetes mellitus and thyroid dysfunction often tend to coexist; hypothyroidism and hyperthyroidism are more frequent in patients with type 2 diabetes [14]. Senegalese authors [15] interested in the clinical, therapeutic and evolutionary aspects of Graves' disease report that the main complication was cardiomyopathy found in 11.1% of patients in their study. The link between diabetes and thyroid disease lies around hyperinsulinism. Chronic excess insulin reveals the mitogenic effect of insulin and induces thyrocyte hyperplasia by stimulating cell division and prolongs cell survival by inducing anti-apoptotic effects [16]. In our case, these may be pre-existing diseases on the one hand when this is the case of thyroid anomalies of an anatomical nature characterized by non-functional nodules or goiters. On the other hand, diabetes and hypertension could be complications of the underlying thyroid pathology; this is particularly the case for hyperthyroidism regardless of the etiological form. This last case can be explained by the physiological role of thyroid hormones; they act on the heart and the circulatory system by increasing the myocardial inotropic effect, the heart rate and peripheral vasodilation leading to an increase in cardiac output [17].

Speaking of the positive diagnosis for which our patients are followed, we observed three varieties (Figure 1). These are simple goiters/nodules (22.78%), hypothyroidism (16.46%) and hyperthyroidism (60.76%) which is by far the most common thyroid disease in our study. This observation which corroborates with previous studies on the thyroid in Guinea [10] [18], is an evidence from which we emphasize that hyperthyroidism is the clinical form of thyroid dysfunction quite

commonly diagnosed in our healthcare structures across the country. As for non-functional goiters and nodules, they are discovered incidentally and represent 27.9% of our study population. This implies that other cases of undiagnosed goiters and nodules exist. This state of affairs would be favored by the fact that patients are asymptomatic, in fact they are unaware and are little concerned about their goiter and consult less. Making the link between iodine deficiency and thyroid dysfunction, thus looking at the prevalence of iodine deficiency on a national scale which is measured at 70% [13], a large-scale study could show a higher proportion of cases of goiters and non-functional nodules in Guinea. Our results are different from those of an epidemiological study of thyroid diseases which reports that, Goiters are the most common thyroid disease and their prevalence reached 23% of adult women, 3% of men [19].

❖ Patient pathway before diagnosis of thyroid disease

Thyroid pathologies lead patients to consult late in Guinea. In our observations, subjects suffering from such conditions wait at least 9 months before resorting to a health care structure for diagnosis (Table 1). Our study shows that this time lost before diagnosis varies according to the type of dysthyroidism. On average, carriers of simple goiters/nodules, hyperthyroidism and hypothyroidism wait 36; 16 and 9 months respectively before proceeding to a first medical consultation. This situation is not a paradox in itself, because the pathogenesis of a multi-nodular goiter includes three following periods. Period of diffuse follicular hyperplasia, period of focal nodular proliferation and period of acquisition of functional autonomy. During the first and second periods, the goiter is more or less visible and asymptomatic. However, the rates of progression from simple multinodular goiter to toxic multinodular goiter and the time required for its development are not precisely known; 9% to 10% of hyperthyroidism develops between 7 and 12 years [20].

From the first consultation to the diagnosis (Table 1), patients delay in accessing the diagnosis. Hyperthyroid and hypothyroid patients spend a relatively short time (5.4; 6.4 months) before the diagnosis is made. While cases of simple goiters/nodules take twice as long (13.7 months) before the diagnosis is made with certainty. This medical wandering and diagnostic delay finds its explanation in the literature. The symptoms of hypersecretion or hyposecretion of thyroid hormones whose effects are felt in several organs, devices and systems of the body [6]-[9].

Regardless of the thyroid function abnormality, patients go through an asymptomatic and then subclinical phase, during which only a TSH or imaging test can detect the disease. At the advanced stage of the disease, it is the signs that lead patients to consult, as was the case in this study (Figure 2). Except for cases of incidental discovery (27.9%), all other subjects had their consultation motivated either by signs of compression (6.3%), signs of hypothyroidism (8.9%), signs of hyperthyroidism (60.4%) and goiter (36.7%). These signs are at first sight suggestive of structural or functional abnormalities of the thyroid gland. Our observation

is that these diseases are not recognized by health professionals in first and second level structures.

We noticed that patients have a sinusoidal course before knowing the status of their thyroid function (**Table 2**). Before arriving in the endocrinology department, they consult first at the university hospitals of Conakry (31.7%). In these places, the majority of patients consult (51.9%) in the general medicine, cardiology (11.4%) and surgery (15.2%) departments. Few subjects consult directly in the endocrinology department (17.7%). We total between 2 to 4 consultations carried out per patient before their disease was mentioned and 31.6% were hospitalized. The subjects were wrongly treated and mainly for malaria (19.0%), HTA (13.1%), Salmonellosis (13.1%) and Diabetes (8.3%). Thus, a proportion of 31.0% of the subjects do not remember the diagnoses that led to care and hospitalization prior to the diagnosis of their thyroid disease. They have been followed for a relatively long time during which memory loss may occur (**Figure 3**).

It is interesting to note that, in their journeys to seek care, 1 subject out of 3 of these patients resorted to traditional medicine. This type of recourse is much more accentuated in hyperthyroid cases, *i.e.* 35.4% of these patients compared to hypothyroidism and simple goiter (**Table 3**). This observation is different from the estimates of the World Health Organization which notes 80% of recourse to traditional medicine in the West African population. On the other hand, our result corroborates the data of a research on West Africa in terms of the use of traditional medicine. This study reports that traditional medicine was used as a first recourse to care by 25% to 50% of the populations in their study [21]. Other authors dealing with the subject of traditional practitioners in French-speaking Africa justify this cultural and social legitimacy by the lack of access to essential medicines and the low purchasing power of the population [22].

It is noted that the mechanisms of contact between patients and the endocrinology department (**Table 4**) were dominated by referral by health workers (73.4%) and orientation by patients (15.3%) already suffering from dysthyroidism. This would reflect multidisciplinary collaboration between colleagues working at university hospitals. These structures are probably the first recourse for patients in our study. Other mechanisms and channels of contact with the department exist for generally low proportions (less than 4%). These mechanisms and channels are essentially radio/television, orientation by a colleague and coming in person.

Our surveys show that before these patients arrive in the endocrinology department, TSH (69.7%), cervical ultrasound (43.0%) and ECG (11.4%) are the most requested tests by professionals referring these patients (**Table 5**). These first two tests are performed as a first-line test for positive diagnosis, assessment of the echo structure and volume of the thyroid gland, its expansion in the vicinity and its compressive tendency. As for the ECG, it is performed on all subjects referred from the cardiology department. These diseases would be followed there for hypertension, heart failure or myocardial infarction and this routine test is one of

the diagnostic methods of this department. In second intention, the autoimmune etiology was sought by the dosage of thyroid autoantibodies (3.8%), the benign or malignant characteristics were also evaluated by the anatomopathological examination of the cytopuncture material of the thyroid gland (2.5%). The patients seen with a thyroid autoimmunity assessment at the first contact of their current follow-up physician are cases diagnosed outside the country where the diagnostic capacity is better improved than Guinea. It is precisely in Europe from where they are directed to contact the endocrinology department upon their return home for possible follow-up.

6. Conclusions

Thyroid disorders affect different devices and/or systems making the clinical picture more complex or even a delay in diagnosis and treatment. These latter aspects, being then multidimensional, could be preceded by a very particular patient itinerary for the diagnosis and management of cases of thyroid gland pathologies.

The patients in this study are similar to other studies conducted in Guinea on the thyroid. In 6 months, we collected and analyzed data that allowed us to understand that thyroid pathologies are little known by first and second level care professionals in the health system in Conakry. Patients follow a sinusoidal path and consult several times before the diagnosis is made late. They have used traditional therapy and have been hospitalized and treated several times for sometimes erroneous diagnoses.

Conflicts of Interest

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

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