

Thyroid Cancers in the Thies Regional Hospital Center: Morpho-Epidemiological Study on 14 Cases

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How to cite this paper: Bentefouet, T.L., Sy, A., Ka, A., Soubeiga, Y., Sow, A., Faye, J.A., Ahouidi, M.J.D., Dial, C.M.M. and Ndiaye, M. (2023) Thyroid Cancers in the Thies Regional Hospital Center: Morpho-Epidemiological Study on 14 Cases. *Open Journal of Pathology*, **13**, 153-163.
<https://doi.org/10.4236/ojpathology.2023.133016>

Received: June 2, 2023

Accepted: July 25, 2023

Published: July 28, 2023

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Abstract

Introduction: Thyroid cancers are malignant cell proliferations developed at the expense of the thyroid gland, and which can spread from a distance. Most cancers appear in the form of anterior cervical swelling. Ultrasound and pathological examination allow the diagnosis of certainty. In Thiès, the studies carried out on thyroid cancers essentially focus on clinico-radiological and therapeutic aspects. We propose, through this study, to describe the epidemiological aspects and the morphological characteristics of thyroid cancers at Thiès Regional Hospital Center. **Methodology:** This is a retrospective, descriptive and analytical study conducted over a period of 3 years and 6 months, from January 2019 to June 2022. All patients with thyroid cancer confirmed by histological examination were included. **Results:** The patients who met the inclusion criteria were fourteen in number (14). The average age of patients was 40, 7 +/- 19 years old with extremes of 08 years and 75 years. Our series reports an 86% majority of women against 14% of men, with a sex ratio of 0.17. The isolated thyroid nodule was the most frequent mode of revelation of papillary thyroid cancers in our series, representing 54.6% of patients. The samplings received at the laboratory were essentially total thyroidectomy specimens. The tumor size varied between 1.5 cm and 14 cm. Papillary thyroid carcinoma was the most frequent histological type, with a frequency of 78.6%, followed by gallbladder carcinoma and squamous cell carcinoma. **Conclusion:** Thyroid cancers affect young subjects and are discovered at a late stage in our context.

Keywords

Thyroid Carcinoma, Senegal, Thiès, Histopathology

1. Introduction

Thyroid cancer is a malignant cell proliferation that originates from the cells of the thyroid gland. Its frequency seems to be increasing; which is probably due to the fact that it goes through the best diagnostic criteria in place [1]. More than 85% of thyroid cancers derive from follicular cells, 80% of which are of papillary histology. They are rare in children and adolescents, and they occur more frequently in young people between 20 and 40 years old [1]. Most thyroid cancers appear in the form of thyroid nodules, but ganglionic, pulmonary or bone metastases can be good indicators [2]. Clinical examination, ultrasound and needle cytology aspiration are the key elements of the diagnosis, the confirmation of which is histological. In Senegal, publications on thyroid cancer are rare and old. They were mainly focused on the clinico-radiological and therapeutic aspects, and were carried out in Dakar, the capital city. We propose, through this work, to study the epidemiological aspects and the morphological characteristics of thyroid cancers in a decentralized area, at Thiès Regional Hospital Center.

2. Patients and Method

This is a retrospective, descriptive study conducted over a period of 3 years and 6 months, from January 2019 to June 2022. The study was carried out in the region of Thiès, located 70 km East of Dakar, more specifically, at the Pathological Anatomy and Cytology (ACP) unit of Thiès Regional Hospital Center (CHRT). Patients were selected from anatomopathological examination reports. Those with a thyroid cancer condition that was confirmed by a histological examination were selected for the study. A standardized information sheet was prepared for data collection from the anatomopathological register. Thus, for each patient, a survey form was made and completed. The following parameters were reported in the form: age, sex, reasons for consultation, imaging data, location of the tumor, weight of the surgical specimen, tumor size, histological type. The samplings got to the laboratory in flasks containing 40% formaldehyde. Macroscopic and microscopic examinations were performed according to the standard model. Hematoxylin eosin is the coloring protocol used. The data collected was anonymized, encoded and then analyzed with Word 2013 and Excel 2013 software. In the descriptive analysis, the qualitative variables were described in the form of frequency tables and bar charts; and the quantitative variables were described according to their position (mean, median and mode) and dispersion (standard deviation, extremes) parameters.

3. Results

From 2019 to 2022, we collected data from 14 patients with a histological diagnosis of thyroid cancer; which corresponds to a frequency of 0.23% of all the analyzes carried out within the laboratory. The distribution of patients by year gave us a frequency of 4 cases/year “**Figure 1**”.

The mean age of the patients was 40.7 years \pm 19 years, with extremes of 08

and 75 years. The median was 41.5 years. The 20-40 age group was the most represented one, with 07 cases, corresponding to 50% of cases “**Table 1**”.

We report a female predominance with a sex ratio of 0.17. For women, the minimum age was 30, and the maximum age was 75. The median was 42 years. For men, the minimum age was 08 years old, and the maximum age 56 years old. The median was 32 years. The thyroid ultrasound showed a heteromultinodular goiter in eight (08) patients; corresponding to 57% of cases “**Table 2**”.

The Eu Tirads score was mentioned for 4 patients; 03 patients were Eu Tirads 3 and 1 patient was Eu Tirads 5.

In 11 patients, the tumor size was measured by macroscopic examination, with a tape measure. The measurement related to fleshy and/or whitish areas. In the case of multiple nodules, we mentioned the minimum and maximum sizes.

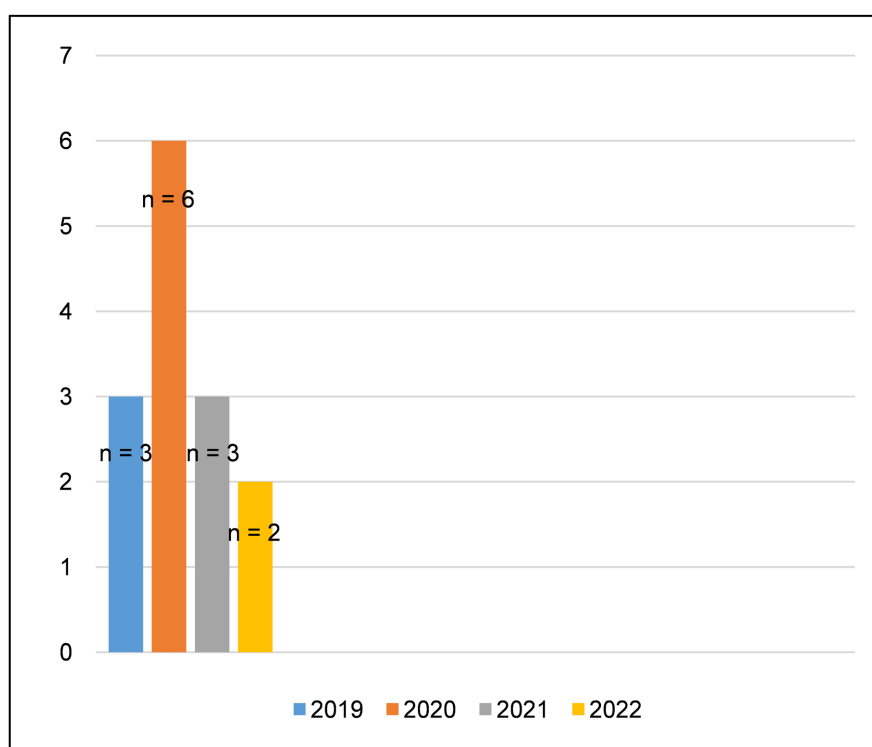


Figure 1. Distribution of patients by year of diagnosis (N = 14).

Table 1. Distribution of patients according to age.

Age	Numbers	Frequency
0 - 20 years old	01	7%
20 - 40 years old	07	50%
40 - 60 years old	05	36%
60 years and over	01	7%
TOTAL	14	100%

In the case of a single nodule that is well or not individualized; the measurement was on the longest axis of the nodular conglomerate. The tumor size in all our patients ranged from 1.5 cm to 14 cm “**Table 3**”.

Histological samplings reached the laboratory secured in 4% formalin. Total thyroidectomy specimens contributed to 42.9% of diagnoses. Elsewhere, lobo-isthmectomy, lobectomy were featured “**Table 4**”. The tumor was located in the right lobe in 08 patients, in the left lobe in 03 patients, and was bilobar in 03 patients.

The microscopic analysis of the surgical specimens drew the conclusion that there was a papillary carcinoma in 79% of the cases, a vesicular carcinoma in 14% of the cases, and a squamous cell carcinoma in 7% of the cases. Papillary carcinoma was found in 11 patients. The histological diagnosis was based on the presence of a papillary structure and/or characteristic “ground glass” nuclei. The mean age was 39.8 years. The most represented age group was that between 20 and 40 years, with a frequency of 45.4% “**Table 5**”.

Table 2. Distribution of patients according to ultrasound data.

Ultrasound results	Numbers	Frequency
Left lobe nodule	03	21.5%
Right lobe nodule	03	21.5%
Heteromultinodular goiter	08	57%
TOTAL	14	100%

Table 3. Distribution of patients according to tumor size.

Tumor size	Numbers	Frequency
0 - 5 cm	07	50%
5 - 10 cm	04	28.6%
Greater than 10 cm	03	21.4%
TOTAL	11	100%

Table 4. Distribution of patients by type of sampling.

Types of direct debits	Numbers	Frequency
Total thyroidectomy	06	42.9%
Right lobectomy	03	21.4%
Right lobo-isthmectomy	02	14.3%
Left lobectomy	02	14.3%
Left lobo-isthmectomy	01	7.1%
TOTAL	14	100%

Table 5. Distribution of papillary carcinoma cases by age.

Age	Numbers	Frequency
0 - 20 years old	01	9.1%
20 - 40 years old	05	45.4%
40 - 60 years old	04	36.4%
60 years and over	01	9.1%
TOTAL	11	100%

The female sex was affected the most, with a frequency of 90.9%. Thyroid ultrasound showed heteromultinodular goiter in 05 patients (45.4% of cases) and thyroid nodules in 06 patients (54.6% of cases). Histological diagnosis was made on total thyroidectomy specimens in 06 patients, on lobectomy specimen in 03 patients and on lobo-isthmectomy specimen in 02 patients. There was a non-encapsulated tumor in all cases, and a bilateral tumor in 02 patients. The tumor size varied between 1.5 cm and 14 cm, with an average tumor size of 5.13 cm. Six patients had a tumor size larger than 3 cm (54.54%). An infiltration of the capsule was observed, with vascular emboli in 03 patients, without any capsular rupture. We did not find any lymph node or visceral metastases. The classic form was found in 01 patient, and the variants were found in 10 patients, corresponding to approximately 91% of papillary cancers. The follicular variant was the most common entity in 82% of cases (n = 9). The oncocytic variant accounted for 9% of cases (n = 1).

Gallbladder carcinoma was found in two (02) female patients, both 36 years old. The ultrasound showed a nodular goiter in all cases. Tumor size was 4 cm in both patients. Diagnosis was made on a lobectomy specimen. Diagnosis of malignancy was based on the existence of a vascular and/or capsular invasion, in the absence of characteristic papillary cancer. A thyroid capsular breach was found in the two (2) patients. It was a minimally invasive unifocal cancer.

Squamous cell carcinoma was diagnosed in a 56-year-old male patient; which was a malignant tumor of the larynx invading the thyroid.

4. Discussion

Our study is retrospective and descriptive, and consists in the analysis of thyroid cancers diagnosed by histology at Thiès Regional Hospital Center. The reported data do not reflect the situation in the general population. This is explained by the fact that patients do not always have access to adequate diagnosis facilities, or resort to traditional treatments. In addition, it sometimes happens that the samplings reach the laboratory without prior fixation in formalin, from a surgical intervention place that is a long way away, thus making histological analysis impossible due to tissue autolysis. We were also faced with the recurrence of incomplete information, particularly on civil status (ethnicity, geographical origin,

etc.), clinical and paraclinical information such as the reasons for consultation, personal and family history, and hormonal biological report. We are also still powerless where there is lack of information on the follow-up of our patients. Indeed, the process that allows to track the patient's medical history is completely beyond our control. As soon as the histological diagnosis is made by the laboratory, the patient is transferred to the oncology services in the capital city for better care.

Differentiated thyroid cancers combining papillary carcinomas and gallbladder carcinomas accounted for 93% of the cases in our series. Papillary thyroid carcinoma was the most predominant histological type in eleven (11) patients; which corresponds to 78.6% of cases. This result is similar to that of Pascal and Ruello who report percentages that are similar to our series, with 82.5% of cases [3]. In general, the incidence of papillary thyroid cancer is variable around the world. In France, the incidence of papillary cancer has increased considerably, with an average annual increase rate of 7.8% in men and 7.2% in women [4]. The "over-diagnosis" hypothesis and the detection of multiple microtumors are put forward by experts as being the main factors of increase in the incidence of papillary cancers [5]. A Canadian study, carried out from 2012 to 2016, reports that the rates of papillary thyroid cancer decrease annually by 3.7% in women, and remain stable in men [5]. The only clearly documented risk factor is medical or environmental irradiation during childhood [6]. The thyroid cancers of Ukrainian and Belarusian children occurring after the Chernobyl accident are a dramatic illustration of this [7] [8]. Apart from irradiation, other factors have been mentioned, even if the results remain controversial: iodine intake deficiency with a goiter, family history of thyroid disease, Asian origin, as well as age [9]. These risk factors were not found in our study.

The average age of our patients also matches that of the other studies and it is around the 4th decade [10] [11] [12]. The youngest of our patients was 8 years old. In the literature, thyroid cancer in children and adolescents is very rare. It has a maximum incidence around 15 years, and it remains very rare before 10 years [13]. The female predominance is similar to that in many series [11] [12] [14] which report a high proportion of women-around 80%. This sexual inequality would be due to hormonal factors that are specific to women, and to pregnancies which would favor the appearance of goiters and thyroid nodules [15]. Age and gender are controversial prognostic factors. Studies have shown that being older than 45 years and male sex are factors of poor prognosis [16] [17].

In the literature, the reasons for consultations are quite varied, with a prevalence of thyroid nodules. The other circumstances of discovery are cervical lymphadenopathy, signs of compression, metastases from the outset, cysts of the thyroglossal tract [2] [18]. Ultrasound data note a predominance of the isolated thyroid nodule as the most frequent mode of revelation of papillary thyroid cancers, accounting for 54.6% of patients. Dyaee *et al.* report a higher percentage of thyroid nodules corresponding to papillary carcinomas in 86.67% of cases

[19]. The discovery of a thyroid nodule on ultrasound raises the problem of the possibility of cancer. The frequency of thyroid nodules in the general population is 4% - 7% for palpable nodules, and 30 to 50% for nodules discovered on ultrasound [2] [20]. Regarding the characteristics of the tumor, numerous studies have shown that tumor size, capsular invasion and extrathyroidal extension were independent prognosis factors. The average tumor size of 5.13 cm observed in our series is larger than the data in the literature. Indeed, differentiated thyroid cancers larger than 4 cm and capsular invasion are correlated with high risk and a survival rate lower than 10 years [18] [21]. The prognosis classification of thyroid cancers according to the AMES (age, presence or not of metastasis, range, tumor size) determined the size of tumors larger than 5 cm as high risk. The Union for International Cancer Control (UICC) considered two thresholds at 2 and 4 cm [22] [23]. Most recent studies have set the threshold at 3 - 4 cm for papillary thyroid carcinoma [24]. Considering the data from the literature about tumor size, it can be argued that most papillary cancers were diagnosed late; and that their prognoses at the time of diagnosis were pejorative. Other prognostic factors such as histological grade defined by the importance of atypia, tumor multifocality, lymph node invasion, the number of invaded lymph nodes and lymph node rupture were noted by most authors as undisputed prognosis factors. They would be associated with a greater frequency of loco-regional recurrences and a high rate of distant metastases [18] [25].

Regarding vesicular carcinoma of the thyroid, the epidemiological profile varies from one patient to another. This histological type was found in two patients in our series, which corresponds to 14.3% of cases. Touati *et al.* [26] and De Sassolas *et al.* [27] had found lower frequencies at 4% and 5.98% in their series. Female predominance is reported by Ogunsina *et al.* [28]. Zhang [29] and Chow [30] found a sex ratio of 2.6 and 2.9 respectively. The average age around forty also matches that of the other series [31].

Thyroid invasion of squamous cell carcinoma of the larynx was reported in 01 patient. This histological type was reported in two (02) patients in Amusa's series, representing 15.4%, thus necessitating laryngectomy and total thyroidectomy. Laryngeal squamous cell carcinomas with thyroid affection strongly reflect advanced stages, and delay in diagnosis is associated with poor prognosis [20].

In our series, the cancer was incidentally discovered on an operating specimen in half of the cases (5 lobectomy specimens and 2 lobe isthmectomy specimens). The solution could be provided by popularizing thyroid needle cytology aspiration, which is inexpensive, and which is currently playing a key role in the evaluation and triage of patients with a thyroid nodule. Figures from the literature concerning the performance of thyroid needle cytology aspiration vary according to studies. They reveal a sensitivity and specificity of around 80% [32] [33].

5. Conclusion

The anatomopathological study remains the only examination that can conclu-

sively decide on the malignant nature of the thyroid nodules. In our context, thyroid cancer affects young people around their forties. They are discovered at a late stage, with a tumor size larger than 3 cm. The promotion of cytological diagnosis means and the improvement of imaging tools would spare patients the trouble of moving to an advanced stage of the disease.

Contribution of the Authors

All authors have contributed to the development of the work, and have read and approved the final version of this manuscript.

Conflicts of Interest

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

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Survey Sheet

Marital Status

- 1) Survey sheet number
- 2) Year of consultation:
- 3) File number:
- 4) Age:
- 5) Sex:
- 6) Occupation:
- 7) Address:
- 8) Ethnicity

Clinical and Paraclinical Information

- 9) Reason for consultation
- 10) Risk factors: a = Family history of thyroid pathology; b = Irradiation notion; c = personal history of treated goiter; d = Other cancer; e = Undetermined.
- 11) Functional signs:
- 12) Physical signs:
- 13) Hormonal check-up: a = Euthyroidism; b = Hyperthyroidism; c = Hypothyroidism.
- 14) Cervical ultrasound: a = yes; b = no.
- 15) Nodule: a = present; b = absent; c = single; d = multiple; e = undetermined.
- 16) Goiter: a = present; b = absent; c = homogeneous; d = nodular; e = undetermined.

Anatomopathological Data

- 17) Type of sampling: a = total thyroidectomy; b = right lobectomy; c = right loboisthmectomy; d = left lobectomy; e = left loboisthmectomy.
- 18) Macroscopic aspect: Weight, macroscopic tumor size.
- 19) Microscopic aspect:
Histological type: a = Papillary carcinoma; b = Vesicular or follicular carcinoma; c = Medullary carcinoma; d = Undifferentiated anaplastic carcinoma; f = other (to be specified).
Capsular infiltration: a = yes; b = no.
vascular emboli: a = yes; b = no.
capsular rupture: a = yes; b = no.
lymph node dissection: a = yes; b = no.
Number of lymph nodes invaded.
Presence of a rupture of the lymph node capsule: a = yes; b = no.