Characteristics of the thyroid gland nodules in Tirana residents and patients from other districts of Albania

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Abstract

Aim: The objective of this study was to compare the distribution of selected socio-demographic factors and clinical features between Tirana residents and individuals from other districts of Albania diagnosed with nodules of the thyroid gland.
Methods: This was a case-series study carried out during September 2016 – September 2017, which included 212 patients examined at the Center of Nuclear Medicine of the University Hospital Center "Mother Teresa" in Tirana (113, or 53.3% patients were residing in Tirana and 99, or 46.7% individuals were residing in other districts of Albania). All patients underwent ultrasound examination, scintigraphy, FNA-cytology and a histo-pathological examination of the thyroid gland. Also, a structured questionnaire gathered other useful clinical information and socio-demographic data.
Results: About 60% of Tirana residents were aged more than 50 years compared with 52% of individuals residing in other districts of Albania. The sex-distribution was very similar in the two groupings (84% of Tirana residents were females compared to 86% of individuals residing in other districts of Albania). There was no significant difference with regard to the preexisting diseases between the two groups (the prevalence was about 35% among Tirana residents and 31% among participants from other districts). Conversely, a positive family history for the presence of nodules of the thyroid gland was significantly more prevalent in Tirana residents compared with participants from other districts of Albania (43% vs. 29%, respectively; P=0.05).
Conclusion: This study provides important evidence about the distribution of socio-demographic characteristics and clinical features of individuals diagnosed with nodules of the thyroid gland in Tirana and other districts of Albania. This information should support physicians and other health professionals in Albania in order to improve the diagnostic procedures and medical treatment for individuals with different pathologies of the thyroid gland.

Keywords: endocrinology, nodules, place of residence, Struma, thyroid gland.

Introduction

Often, in daily routine, there is evidence of individuals with big Struma of the thyroid gland which is easily visible and there is no need for any kind of medical examinations. Besides this, in medical facilities, several individuals seeking medical care exhibit nodules of thyroid gland with a size of at least 10 mm, which are palpable. On the other hand, a big number of cases result negative upon palpation. Such cases are evidenced by use of ultrasound examination. Therefore, the use of ultrasound examination has revealed and diagnosed many cases with nodules of the thyroid gland in the past two decades in all countries of the world, which would be otherwise missed upon employment of the palpation method only (1).

Conventionally, nodules of the thyroid gland include hyperplasia, neoplasia and inflammatory diseases which induce establishment of nodules of the thyroid gland (1). At a global scale, there is evidence of an increase in the prevalence of the nodules of the thyroid gland as indicated by means of ultrasound examination (1). It should be emphasized that, the increase in the prevalence of the nodules of the thyroid gland goes in parallel with the increase in the incidence rate of the cancer of the thyroid gland worldwide, considering that malignant forms comprise around 5% of the nodules of the thyroid gland, regardless of their size (2,3). Under these circumstances, the majority of the nodules of the thyroid gland are benign and, hence, a main objective in these cases would be the distinction of the type of the nodules (malignant vs. benign) in order to avoid all cases of needless surgical interventions (4). The ability to detect the nodules of thyroid gland through the physical examination depends on the location of the gland, anatomy of the neck of a given patient, type (superficial vs. deep), presence of obesity for a given patient, as well as experience of the examiner. In any case, the prevalence of the nodules of thyroid gland is estimated at around 4% upon palpation, whereas the clinical sensitivity for thyroid malignant conditions is rather low (5). Clinical indications for malignant forms include: the size of the nodule (the chances of malignancies increase for the nodules with a size greater than 4 mm); a gradual increase in the size of the nodules; consistency of the nodules; cervical lymphadenopathy; distant metastases; dysphagia; local pains; as well as Horner's syndrome (6,7).

The ultrasound examination of the thyroid gland was used for the first time in 1967 by Fujimoto in order to detect the development of nodules of this gland (8). This examination is certainly more accurate and reliable than palpation for the identification of solitary or dominant nodules within multinodular Struma. In addition, ultrasound examination provides similar results with autopsy for the identification of the nodules of thyroid gland (7,9,10).

According to well-established guidelines, ultrasound examination is the first examination for suspected cases with different pathologies of the thyroid gland (4). The ultrasound examination indicates the size of the lobes of thyroid gland, the size of the nodules, the number of the nodules, the echogenicity (isogenicity, hypogenicity, or hypergenicity), as well as the adjacent structures of the neck. Ultrasound examination is a non-invazive and relatively cheap procedure, very easy to conduct in practice and pretty valid for detection of the nodules with a size of 2 mm and above, which allows for detection and prompt treatment of the nodules of thyroid gland at an early stage (11).

However, results depend on the operators and, therefore, positive outcomes are much more frequent in specialized centers with experienced personnel and longstanding tradition with this procedure (11). Many studies report on the contribution of ultrasound examination for differentiation of the type of the nodules (benign vs. malignant) (4,12). The evidence suggests that the echogenicity, presence of intra-calcifications type of boundaries, as well as intra-nodular vascularisation are all independent risk factors for malignancies (4,12). Of note, an increase in the size of the nodules of thyroid gland is an important factor for malignan-

cies and, therefore, FNA should be repeated in cases when it has preliminarily provided negative results (13). Notwithstanding controversies about this matter, presence of calcifications within the nodules of thyroid gland should be considered as an important factor for malignant conditions (14,15). Likewise, intra-nodular arterial flux is an important factor for malignancies (16).

In all cases, the ultrasound examination of the thyroid gland should include assessment of laterocervical nodules. Metastatic lymphnodules resulting from the cancer of thyroid gland consist of big structures, losing the hilar imaging increase, while the structure gets restricted (17). Finding of such laterocervical lymphnodules in a thyroid gland with suspicious nodules point to a high probability for the presence of malignant conditions of the thyroid gland (7,18).

The evidence for Albania, a transitional post-communist country in the Western Balkans, is rather scant. As a matter of fact, to date, there are no well-documented scientific reports informing about the magnitude and the main risk factors for development of the nodules of the thyroid gland in the Albanian adult population. In this context, we aimed to describe some important socio-demographic characteristics and clinical features of individuals diagnosed with nodules of the thyroid gland in Tirana residents and in individuals residing in other districts of Albania.

Methods

A case-series study was conducted during September 2016 – September 2017 at the Center of Nuclear Medicine of the University Hospital Center "Mother Teresa" in Tirana. During this period under study, there were enrolled 212 patients who were comprehensively examined including ultrasound examination, scintigraphy, FNA-cytology and a histopathological examination of the thyroid gland. Selected patients underwent also thyroidectomy and were subsequently provided with a post-operational biopsy. Patients included in this study were referred from endocrinologists of all districts of Albania, the consultation office of the Endocrinology Service and other Services of the University Hospital Center in Tirana such as Cardiology, Infectious Diseases, Oncology, Internal Medicine, Emergency Unit, as well as other services.

Furthermore, valuable clinical information was collected for all patients included in this study such as the presence of other diseases, preceding examinations of the thyroid gland or treatment with iodine medications.

Also, all patients in this study were asked a series of close-ended questions about an array of socio-demographic factors such as age, sex place of birth, place of residence, educational attainment and level of income.

Fisher's exact test was used to assess potential differences between Tirana residents and individuals residing in other districts of Albania in terms of socio-demographic factors (age-group, sex, and place of birth) and clinical characteristics (presence of other diseases, and family history for nodules of the thyroid gland).

Results

Table 1 presents the distribution of socio-demographic characteristics and clinical features in individuals residing in Tirana and those residing in other districts of Albania.

On the whole, there were 113 (53.3%) patients residing in Tirana compared with 99 (46.7%) individuals from other districts of Albania.

About 60% of Tirana residents were aged more than 50 years compared with 52% of individuals residing in other districts of Albania. However, this age-difference was not statistically significant (Fisher's exact test: P=0.21).

The sex-distribution was very similar in the two groupings: 95 (84.1%) of Tirana residents were females versus 85 (85.9%) of individuals residing in other districts of Albania.

As expected, the majority of Tirana residents were born in this district (that is the capital of Albania), whereas only a very small proportion of partici-

pants from other districts were born in Tirana (about 71% vs. 6%, respectively; P<0.001).
On the other hand, there was no significant difference with regard to the preexisting diseases between the two groups (the prevalence was about 35% among Tirana residents and 31% among participants from other districts).

Table 1. Distribution of socio-demographic characteristics and clinical features in patients with nodules of the thyroid gland by place of residence in Albania

Variable	Tirana (N=113)	Other districts (N=99)	P[†]
Age-group:			
≤50 years	45 (39.8)[*]	48 (48.5)	0.215
>50 years	68 (60.2)	51 (51.5)	
Sex:			
Men	18 (15.9)	14 (14.1)	0.848
Women	95 (84.1)	85 (85.9)	
Place of birth:			
Tirana	80 (70.8)	6 (6.1)	<0.001
Other districts	33 (29.2)	93 (93.9)	
Existing diseases:			
No	73 (65.2)	68 (68.7)	0.661
Yes	39 (34.8)	31 (31.3)	
Family history:			
No	64 (56.6)	70 (70.7)	0.045
Yes	49 (43.4)	29 (29.3)	

[*]Absolute numbers and column percentages (in parentheses).
[†]Fisher's exact test was used for the comparison of proportions of all variables between individuals residing in Tirana and individuals residing in other districts of Albania.

Conversely, a positive family history for presence of nodules of the thyroid gland was significantly more prevalent in Tirana residents compared with participants from other districts of Albania (43% vs. 29%, respectively; P=0.05) [Table 1].

Discussion

This is one of the few studies informing scientifically about the distribution of socio-demographic factors and clinical characteristics between Tirana residents and individuals from other districts of Albania who were all diagnosed with nodules of the thyroid gland at the only tertiary medical facility in Albania that is the University Hospital Center "Mother Teresa" in Tirana.
Overall, this study documented an increasing number of patients affected by the thyroid gland pathologies, with a clear predominance among females. On the face of it, the number of patients residing in Tirana was bigger than the number of patients resident in all the other districts of Albania. This may relate to the fact that the population of Tirana has rapidly increased in the past two decades and, notwithstanding the official figures, it may include at least one third of the overall Albanian population. In addition, it is much easier for Tirana residents to seek care at the University Hospital Center as it is located in this very city.
Overall, about 44% of the patients (93 individuals) were 50 years or younger, which raises concerns and points also to the need for young adults and middle-aged individuals to promptly seek medical care in cases when there is a hint for the presence of nodules of the thyroid gland.
Interestingly, in our study, there was evidence of a positive and significant association between family

history of the nodules of thyroid gland and residence in Tirana.

On the whole, the ultrasound examination was valid in 100% of the patients included in this study, which points to the usefulness and validity of this examination procedure. As opposed to ultrasound examination, scintigraphy provides more functional information instead of morphological evidence. This examination is usually undertaken in patients with nodules of the thyroid gland in order to assess the echogenicity of the nodules (isogenicity, hypogenicity, or hypergenicity) (4,19). According to AACE / AME, it is recommended to conduct the scintigraphy of the thyroid gland only if the TSH is below the lower limit of the normal values, or in cases when the patient has a big nodule or a multinodular Struma (20). The "hot" nodules consist of toxic adenomas and comprise 5%-10% of all nodules. Malignant nodules are less prevalent and comprise 1%-4% of the cases (20,21). On the other hand, about 80% of the "hot" nodules and "cold" nodules are benign, but the remaining 20% require FNA-biopsy because of their malignant potential (21). The routine use of scintigraphy in all patients with nodules of the thyroid gland is questionable, at least in terms of its cost-effectiveness (22).

On the other hand, CT-scan and MRI are two types of examinations that play a major role for assessment of adjacent structures involved, as well as the ectopic location of the thyroid gland.

Conversely, PET-scan is used in patients with cancer in order to assess the extent of the tumor, as well as the presence of metastases. After thyroidectomy, FDG-PET has been proved as an effective method in patients with clinical or serological evidence of repeated or metastatic carcinomas of the thyroid gland. Furthermore, the SPECT/CT examination with iodine (I131) is useful for the assessment of local or metastatic recurrences (23).

The current study may suffer from some drawbacks and limitations. Although we included in this study all consecutive patients with nodules of the thyroid gland examined during a period of one year at the University Hospital Center "Mother Teresa", which is the only tertiary care facility in Tirana, there may have been many other cases with such pathologies which have not been referred to this medical center. This fact may have led to selection bias of the sample of patients included in our study. Regarding the possibility of information bias, the diagnosis of the nodules of the thyroid gland in our study was based on standardized procedures and protocols which are currently used in studies conducted in many other countries worldwide. Yet, the possibility of bias cannot be completely discarded for the questionnaire-based information which gathered socio-demographic data and other useful clinical information. In any case, there is no plausible evidence of differential reporting between Tirana residents and individuals residing in other districts of Albania.

In conclusion, regardless of the possibility of selection bias and information bias, this report provides important evidence about the distribution of socio-demographic characteristics and clinical features of individuals diagnosed with nodules of the thyroid gland in Tirana and other districts of Albania. The information provided from this report will help and support physicians and other health professionals in Albania in order to improve the diagnostic procedures and medical treatment for individuals with pathologies of the thyroid gland.

Conflicts of interest: None declared.

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