

Thyroid Nodule and Thyroid Cancer Incidentally Detected by Ultrasonography in Adu+Lts Outpatients with Unknown Thyroid Disease

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Abstract: Thyroid nodules are a very frequent pathology of thyroid gland and mostly they are benign. Their prevalence varies according to the method we use to detect them. When we use ultrasound prevalence varies from 5-68 %. Ultrasound is safe, painless easy to performed, fast and non-invasive medical test to detect thyroid nodule. **Objective:** To see the incidence of thyroid nodule and thyroid cancer detected by ultrasonography in outpatients healthy individual.

Material and methods: This retrospective study is done at American Hospital during 1 October 2014 until 30 December 2014. We included 700 healthy adult outpatients. Exclusion criteria included age under 18 years old, history for thyroid disease, thyroid cancer or previous thyroid surgery. We performed conventional thyroid ultrasound in all patients by using transducer 10-13 MHz. The presence and the size of the nodules were than correlated with age and gender. We separated solitary thyroid nodules into two subclasses: ≤ 10 mm and >10 mm.

Results. Thyroid ultrasound was performed in 700 participants and from them 584 (83, 4%) were females and 116 (16, 6%) were males. Mean age was 45,1 years old $\pm 12,65$ SD range from 18 -76. Thyroid nodules were present in 36.2% (238/700) with ratio female/male 7:1. From the 238 participants with nodules, solitary nodules were present in 57.1% of them and multinodular goiter were present in 42,9%. Incidental thyroid nodules were detected in 29,3% (34 out of 116) of males and in 34,9% (204 out of 584) of females . Females had a higher frequency of nodularity than men ($p < 0.001$). For solitary nodules and MNG females had a higher frequency than males respectively 81.6% versus 18.4%, and 91,1% versus males 8,9 %. For nodules over 10 mm females showed a prevalence of 26.1% and males 20% ($p = 0.284$), but without a significant gender difference. For nodules less than 10 mm female showed a prevalence 73,8% and males 80%.

Conclusion. Our date showed that thyroid nodules were very common findings almost 36.2%.

The thyroid nodules were more common in women than in men. The number of cases with thyroid cancer was lower.

Keywords: thyroid nodule, thyroid cancer, ultrasound.

1. INTRODUCTION

Thyroid nodules are a very frequent pathology of thyroid and mostly they are benign, but 5% them can be malignant and papillary thyroid cancer is the predominant form approximately from 75 to 80 % (1). Thyroid nodule can be defined as the presence of a lesion within the thyroid gland distinct from the surrounding thyroid parenchyma which can be detectable by palpation or ultrasound (2). The possibility to have thyroid nodules increases with age, in females, or in area with iodine deficiency and radiation exposure (3). The prevalence of thyroid nodules varies from the population, studies and the methods that we used to detect them. With palpation the prevalence varies from 2-6% and a high prevalence is seen on autopsy by 65% (4). With wide uses of thyroid ultrasound the prevalence of nodules has been increasing varying from 20 – 67%. This can explain the high frequency of incidentally detected thyroid nodules (5).

Ultrasound is considered as first choice for evaluation of thyroid nodules since it can detect:

- nodules that are too small to be palpated,
- the presence of multinodular goiter,
- we can measure the size of the nodules and follow them,
- the characteristics of the nodules that suggest us for malignancy and
- Performed guided fine needle aspirate cytology FNAC (6).

Ultrasound is safe, painless easy to performed, fast and noninvasive medical test for thyroid nodule. The aims of our study were to see the prevalence of thyroid incidentaloma and thyroid cancer in healthy adult outpatients evaluated with thyroid ultrasound.

2. MATERIAL AND METHODS

This retrospective study is done at American Hospital between 1 October 2014 and 30 December 2014. We used the records of 753 adult outpatients. A sum of 53 patients had past history for thyroid disease and was excluded from the study so a total of 700 cases were enrolled in. All of them underwent thyroid ultrasound screening; all the patients performed the ultrasound in supine position and hyper extended neck using a high resolution ultrasonography (Sonoline G 20 with 10 MHz, Siemens Germany). The nodule was defined as the presence of a lesion within the thyroid gland which was sonographically distinct from the surrounding thyroid parenchyma and the size and the number of the nodule if present were recorded. From a total of 700 patients 584 were females and 119 were males.

Thyroid ultrasound finding were classified:

1. No thyroid nodule.
2. Solitary nodules the presence of one nodule subdivided than in two groups.
 - a. < 10 mm
 - b. > 10 mm
3. Presence of two or more nodules was classified as multinodular goiter.

Statistical analysis: Continues variables are summarized by mean values and standard deviation for statistical analyses we used Microsoft Excel 2010. For the analysis of two independent variables we used calculation of correlation and regression. Bivariate logistic regression analyses are done to see the influence of the age for the possibility to have a nodule. Values are reported either as the mean SD or odds ratio (OR) and 95% confidence intervals (CI). $P < 0.05$ was considered statistically significant.

3. RESULTS

We screened a total of 700 adult patients, 584 (83,4%) females and 116 (16,6%) males. Mean age was 45,1 years old $\pm 12,65$ SD range from 18 -76.

Tab 1. Population study according to the age and gender distribution

	Population study	Minimum age (years)	Maximum age (years)	Mean age (years)
Females	584	18	77	44 \pm 12
Males	116	21	72	44,3 \pm 14,8
Total	700	18	77	45,1 \pm 13.1

Thyroid nodules:

From a total of 700 adult cases thyroid nodules were detected in 238 adults (34 %) and 462 adults (66 %) didnt presented any thyroid nodule. From these 238 participants with nodules, solitary nodules were present in 57.1% of cases and multinodular goiter (MNG) was present in 42,9% of them (Fig 1).

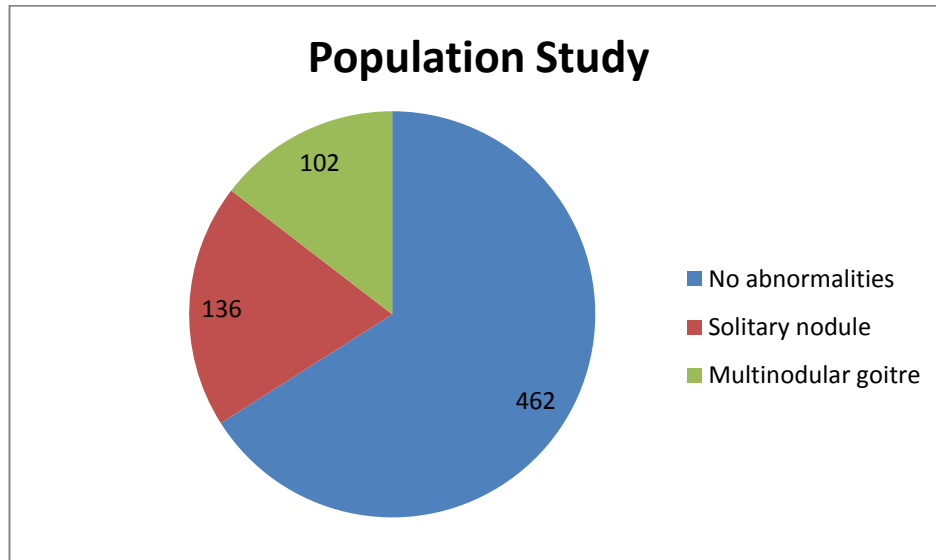


Fig 1. Distribution of nodules in the study population

Incidental thyroid nodules were detected in 29,3 % (34 out of 116) of males and in 34,9% (204 out of 584) of females. Females had a higher frequency of nodularity than men ($p < 0.001$), Fig 2. For solitary nodules and MNG females had a higher frequency than males respectively 81.6% versus 18.4 % and 91,1% versus males 8,9%.

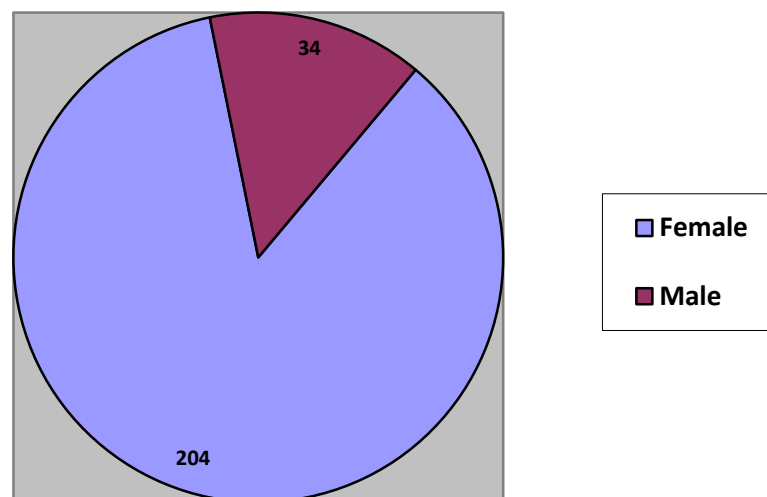


Fig 2. Gender distribution of thyroid nodules

We separated the data in three age groups: age 18-40, age 41-60 and age over 61. Among the subjects with thyroid nodules around 60,5 % were in group age between 41-60 years old; 20,1% were in group 16-40 and 19.4% in participant over 61 years old. In patient younger than 40 years old the prevalence of thyroid nodules in female was 20,59% and in males 14,71% . Between 41-60 years old the presence of nodules was 63,73 % in females and 35,29% in males and over 61 years old there was a decrease for females to 15,69 % and males showed a further increased to 50 % .The distribution of thyroid nodules in different age groups and gender is shown Fig 3 and Tab 2 are recorded all prevalence of nodules and no abnormalities in female and males of different age groups.

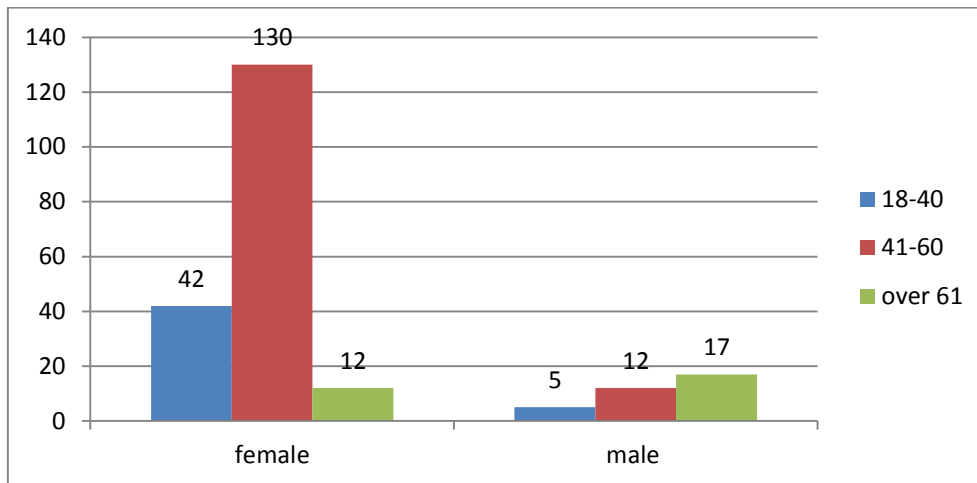


Fig 3. Prevalence of thyroid nodules in different age groups and gender

Tab 2. The prevalence of nodules and no abnormalities in female and males of different age groups

Gender	Females			Males		
	presence nodul			presence nodul		
Age	No (n=379)	Yes (n=204)	Total (n=583)	No (n=82)	Yes (n=34)	Total (n=116)
18-40	188 49.60%	42 20.59%	230 39.45%	32 39.02%	5 14.71%	37 31.90%
41-60	166 43.80%	130 63.73%	296 50.77%	35 42.68%	12 35.29%	47 40.52%
>61	25 6.60%	32 15.69%	57 9.78%	15 18.29%	17 50.00%	32 27.59%

We used bivariate logistic regression analysis including age and the presence of the nodules. For each increase of one year of age chances grow by 5% to have a nodule. The age was an independent risk factor [OD: 1.05, Ci95%: 1.04-1.07], see tab 3.

Tab 3 a. Bivariate logistic regression analysis including age and the presence of the nodules

Variables	Presence of the nodule		P value	OD	95% C.I.
	YES (n=462)	NO (n=238)			
Age	42.51+12.43	50.29+11.48	.000	1.053	1.039 1.067

When we used Kendall rank correlation we saw significant positive correlation between age and gender ($r=0.245$, $p<0.001$). We separated solitary thyroid nodules into two subclasses:

≤ 10 mm and >10 mm. For nodules over 10 mm females showed a prevalence of 26.1 % and males 20% ($p=0.284$), but without a significant gender difference. For nodules less than 10 mm female showed prevalence 73, 8 % and males 80 % P. Distribution of the size of the nodules according to the group's age and gender is given at Table 3.

Tab 3 b. Different size of nodules and gender specific in age related groups.

Gender	Female			Male		
	nodule size		Total (n=111)	nodule size		Total (n=25)
Age/years old	>10 mm (n=29)	≤ 10 mm (n=82)		>10mm (n=5)	≤ 10 mm (n=20)	
18-40	8 27.59%	22 26.83%	30 27.03%	2 40.00%	2 10.00%	4 16.00%
41-60	15 51.72%	52 63.41%	67 60.36%	2 40.00%	7 35.00%	9 36.00%
>60	6 20.69%	8 9.76%	14 12.61%	1 20.00%	11 55.00%	12 48.00%

In total the percentage of malignancy in our study was 0,42% (3) and inside the groups with thyroid nodule it was 1,26 %. All three patients were female and were diagnosed with papillary thyroid cancer.

4. DISCUSSION

Our study is done in Tirana the capital city of Albania. According to the date from 2009 we are still a country with mild iodine deficiency despite the introduction of iodine prophylaxis, since 1995, because we have limited environmental sources of iodine (7). Thyroid nodules are seen very frequently in area with iodine deficiency (8). The sample was well balanced for gender: women 53.9%; and men 46.1%. We found 66 % subjects without any thyroid nodule and 34% of cases with thyroid nodule, 57.1% with solitary nodules and 42,9% with multinodular goiter. Our results are comparable with those reported by other study 9.4 %; 14.8%; 17 %; 13% and 40%, respectively by Steele et al; Karaszewski et al; Tomimori et al; Carrol et al; and Stark et al (9-14). In 2006 Bartolotta et al reported thyroid nodules in 33 % of 704 subjects without any thyroid disease. Our data are only in part consistent with those previous findings: we found a progressive increased prevalence of thyroid nodules with age in males but in females over 61 years old there was a decrease from 63,73% in age groups 41-60 to 15,69 %. Maybe these result are related with the facts that :

- our participants are young with the mean age 45,1 years old $\pm 12,65$ SD,
- 60,5% of our participant belongs to the group age from 41-60 years old,
- the number of females get decreased from 130 from group age 41-60 to 32 in the group over 61 years old, which is in contrast with males where the number of males with nodules is increased with the age.

The overall percentage of malignancy in our study is 0,42%, which is lower than other reported study. Cappelli et al reported 3,6 % thyroid cancer and in the study of Lin et al the incidence of thyroid malignancy was 2.98% (14.15). Our study have some limitation because we had a small number of participant for ages over 61 and maybe these is related with the fact that these study was part of a preventive health check up in our hospital, for most of the patients we didn't have data for pathology result or follow up.

In conclusion the prevalence of thyroid incidentaloma are common in especially in subjects living in a mild to moderate iodine-deficient area and often they go undetected so screening could be reasonable in subjects at a higher risk. The frequency of thyroid nodules increased with age in both women men and and was, in all age-groups, more frequent in women than in men.

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