

Research Article

Thyroid Nodules: Are There Gender Differences?

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Abstract

Background: Although gender has always been regarded as one of the essential epidemiological factors to take into account when researching thyroid illnesses, the relatively recent field of gender medicine has contributed to providing fresh insights into the topic. The existing research in clinical practice confirms the significance and frequency of both functional and neoplastic thyroid problems. Our goal is not to address every aspect of the topic but rather to provide some guidance to initiate a new and thought-provoking discussion. As a result of a fruitful mindset shift in our practice, further research is required to develop better diagnostic and therapeutic procedures and incorporate them into everyday clinical work-up. **Aim of the study:** To evaluate how common the thyroid nodules are in females in comparison to males in Minia governorate in the period from December 2020 to June 2023. **Patients & Methods:** This study included 100 euthyroid patients with thyroid nodules diagnosed with ultrasound; **Results:** The patients' ages ranged from 18 to 79 years, with a mean age of 39.8 years \pm 12.2. 10 of them were males (10%) and 90 were females (90%). The Majority of the patients had thyroid nodules in their right and left lobes, 44% and 31% respectively. Furthermore, most of them were classified as TIRADS III and IV. **Conclusion:** As people age, thyroid nodular disease becomes more common and is more prevalent in females.

Key words: Thyroid nodules, TIRADS, Age, Gender.

Introduction

It is well known that gender variations are important clinical factors that should be considered in the diagnosis, prognosis, and treatment of the majority of diseases ⁽¹⁾. No exemption applies to endocrine disorders. The term "gender" encompasses more than just "sex"; although "sex" refers to the biological distinctions between men and women brought about by hormones and genetics, "gender" refers to a variety of cultural, psychological, and environmental aspects. Research indicates that women have a greater incidence of metabolic and endocrine changes than men do, with varying clinical paths and consequences.

It should come as no surprise that endocrinologists play a significant role in gender medicine and may contribute significantly to the medical management of endocrine disorders using this relatively new approach ⁽²⁾. Thyroid disorders are the third most common endocrinopathy, following osteoporosis/osteopenia and diabetes, according to growing epidemiological statistics. An estimated 200 million individuals worldwide may be impacted by thyroid disorders of some type ⁽³⁾. Our objective is to provide an overview and quick analysis of the current knowledge about how gender affects the thyroid.

Patients & Methods

Study Design and Sample: This cross-sectional research was conducted between December 2020 and June 2023 on 100 patients, aged 18 to 79, who were selected from the endocrine outpatient clinic at Minia University Hospital.

Every patient in the study had a comprehensive history taken and a clinical physical examination. Thyroid function tests, antithyroid antibodies (such as thyroid peroxidase antibodies, or anti-TPO Antibodies), and thyroglobulin antibodies using ELISA kits are among the laboratory investigations that are undertaken .

A radiology professional performed an ultrasound (US) on each patient to assess the thyroid parenchyma. Each set of data was evaluated and scored using the

malignancy risk grading method developed by the American College of Radiology (ACR-TIRADS) ⁽⁴⁾.

Ethical consideration:

Ethical permission was taken by the research ethical committee of the Faculty of Medicine in Minia University (ethical approval number 806-08-2021). Written consent was obtained from all participants after providing comprehensive information about the aim and the nature of the study. The issues of privacy and confidentiality of all study participants were considered

Statistical analysis

The statistical program for social science, SPSS version 20, was used to do statistical analysis and presentation utilizing the mean, standard deviation, student t test, Chi-square, and Mann-Whitney U test.

Results

Table (1): Demographic characteristics of the studied group (n = 100)

Variable	Mean \pm SD or N (%)
Age (years)	
Range	18 - 79
Mean \pm SD	39.9 \pm 12.1
Sex	
Male	10 (10%)
Female	90 (90%)

Table (2): Ultrasound characteristics of the studied group (n = 100)

Variable	N (%)
Left lobe nodule	31 (31%)
Cystic nodule aspirated with an alcohol injection	9 (9%)
Multinodular goiter with large nodule	8 (8%)
Nodule with calcifications	3 (3%)
Right lobe nodule	44 (44%)
Solitary isthmic nodule	5 (5%)

*Qualitative data are presented by N (%)

Table (3): TIRAD characteristics of the studied group (n = 100)

Variable	N (%)
TR2	13 (13%)
TR3	45 (45%)
TR4	36 (36%)
TR5	6 (6%)

Table (4): Laboratory characteristics of the studied group (n=100)

Variable	Mean \pm SD
TSH (mIU/l)	
Range	0.15–4.5
Mean \pm SD	2.2 \pm 1.02
Free T4 (ng/dl)	
Range	0.8–1.9
Mean \pm SD	1.2 \pm 0.21
TPO.AB	
Range	1-400
Mean \pm SD	22.4 \pm 55.8
Antithyroglobulin	
Range	0.8–200
Mean \pm SD	13.1 \pm 27.8

*Quantitative data are presented by mean \pm SD

Our patients were 10(10%) males and 90 (90%) females; their mean age was (39.9 \pm 12.1). As regards the site of the dominant nodule in the thyroid gland detected by ultrasonography, there were 31 patients with a left lobe nodule, 44 patients within the right lobe, 5 in the isthmus, 8 patients with multi-nodular goiter and 3 calcified nodules. These patients also classified according to the TIRADS system into 13 patients with TIRADS II, 45 patients with TIRADS III, 36 patients with TIRADS IV and 6 patients with TIRADSV.

All of the patients are in an euthyroid state, within the normal range of TSH (0.15 – 4.5) and free T4 (0.8 – 1.9), also normal thyroid antibodies, including thyroid peroxidase AB with a mean (22.3 \pm 55.9) and antithyroglobulin (13.12 \pm 27.9).

Discussion

Our patients were 10(10%) male and 90 (90%) female, the mean age of them was 39.9 \pm 12.1. Kwong et al., examined the

relationship between patient age and thyroid cancer risk, multinodularity, and nodule development. Of the 6391 individuals they examined, 943 (15%) were male and 5447 (85%) were female. The mean age of the patients was 47.4 \pm 10.8, and the researchers concluded that as people age, the prevalence of thyroid nodular disease increases ⁽⁵⁾.

According to Rahbar et al., there may be a connection between females' greater incidence of thyroid nodules and cancer and estrogen and the state of estrogen hormone receptors in thyroid cells. Furthermore, it was discovered that the risk of thyroid cancer is tripled for reproductive women ⁽⁶⁾.

We classified the thyroid nodules according to their site into Lt lobe nodule (31%). Multinodular goiter with large nodule (8%), right lobe nodule (44%), Solitary isthmic nodule (5%); all of them within the euthyroid state, within the normal range of TSH (0.15–4.5) and free T4 (0.8–1.9), as

well as normal thyroid antibodies, including TPO.AB with a mean range (22.4 ± 55.8) and antithyroglobulin (13.1 ± 27.8). Thyroid nodule placement was assessed by Jasim et al., in 2020, who classified the nodules as upper, middle, lower, or isthmic. They discovered that the nodule is a distinct risk factor that predicts the probability of thyroid cancer. Lower lobe nodules have the lowest probability of cancer diagnosis, while isthmic nodules have the highest risk ⁽⁷⁾.

Conclusion

In this study, we have revealed that the prevalence of thyroid nodular disease increases with advancing age and is predominant in the female gender.

Recommendations

One of our study's limitations is its cross-sectional design. Therefore, we advise doing a more extensive cohort and comparative investigation. Limitations in funding are another barrier to screening additional cases.

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Conflict Of Interest

All authors have no conflict of interest.

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Author contribution:.

All authors contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript.

Abbreviations

ACR: American College of Radiology
TIRADS: Thyroid Imaging, Reporting, and Data System
TSH: Thyroid Stimulating Hormone
US: Ultrasound
free T4: free thyroxine
TPO AB: thyroid peroxidase antibodies

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