SJIF Impact Factor: 6.711

WORLD JOURNAL OF ADVANCE HEALTHCARE RESEARCH

ISSN: 2457-0400
Volume: 9.
Issue: 7
Page N. 439-444
Year: 2025

Original Article www.wjahr.com

CLINICOPATHOLOGICAL CHARACTERISTICS OF THYROID NODULES AMONG ADULT IRAQI SAMPLE

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Article Received date: 19 May 2025 **Article Revised date:** 09 June 2025 **Article Accepted date:** 30 June 2025

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ABSTRACT

Background: Thyroid nodules (TNs) are estimated to affect 20% to 60% of the world's population, with rates varied by gender, age, and environment. In order to estimate the malignancy risk of nodules, specific clinicopathological characteristics such as unclear boundaries, micro-calcifications, irregular forms, solid components, and internal echoes are frequently employed.[7-8] However, it is not possible to distinguish between benign and malignant nodules with accuracy using just one characteristic. **Objectives:** Is to analyze the clinicopathological characteristics of thyroid nodules in a sample of Iraqi patients, as well as their available diagnostic and therapeutic options. **Methods:** A cross-sectional study of recorded data from the department of general surgery at Hamdanyia General Hospital, from January 2024 to the end of December 2024. The study included 50 subjects initially diagnosed with solitary thyroid nodule. Complete history and physical examination were taken from all of them as well as laboratory tests (including thyroid function tests), preoperative imaging, FNAC results, management, and final histological diagnosis. To aspirate cytological samples, a disposable plastic syringe with a 10-milliliter volume and a fine, 22-gauge needle were utilized. **Results:** The mean age ± standard deviation of the study participants was 36.21 ± 9.11 years. Moreover; male: female was 1:2.84. Furthermore; the majority of the patients were aged less than 30 years. In addition to that; the majority of patients had painless cervical swelling. It's evident that the 86% of patients had normal thyroid function, followed by low thyroid function 8% and then elevated thyroid function 6%. Among females, 28 (75.67%) patients had solid mass and 9 (24.33%) patients had cystic mass. While among males, 10 (76.92%) patients had solid mass and 3 (23.08%) patients had cystic mass. lobectomy plus isthmusectomy was done for 31 (62%) patients followed by bilateral subtotal thyroidectomy for 10 (20%) patients. benign cytological findings was shown in 41 (82%) patients and colloid nodules in 40 (80%) patients. **Conclusion:** Higher incidence of solitary thyroid nodules is likely to occur in women and among those aged less than 40 years. Iraqi people with solitary thyroid nodules has similar clinical and epidemiological features to those from other countries. Most the patients had solid nodules and treated by lobectomy plus isthmusectomy. Most of the cytological and histopathogical results of thyroid nodules were shown to be benign and from colloid nodules.

KEYWORDS: Iraq, Nineveh, Neck swelling, Nodule.

1- INTRODUCTION

Thyroid nodules (TNs) are estimated to affect 20% to 60% of the world's population, with rates varied by gender, age, and environment.[1] Approximately 90-95% of these nodules are benign and asymptomatic at diagnosis and during follow-up.[2] However, improvements in monitoring and diagnostic technologies have coincided with an increase in the prevalence of thyroid cancer, especially papillary thyroid carcinoma (PTC) and papillary thyroid microcarcinoma (PTMC). Additionally, there has been a 1% yearly percent shift in the incidence-based death from thyroid cancer.[3-4] The widespread use of high-resolution scanners and modern ultrasound (U/S) technology have made it considerably simpler to identify TNs.[5] Moreover; accurately differentiating benign from malignant TNs is the main issue for many surgeon and sonographers.[6] In order to estimate the malignancy risk of nodules, specific clinicopathological characteristics such as unclear boundaries, micro-calcifications, irregular forms, solid components, and internal echoes are frequently employed.[7-8] However, it is not possible to distinguish

between benign and malignant nodules with accuracy using just one characteristic.[9] Thyroid nodular pathology is now often evaluated by fine needle aspiration cytology (FNAC).[10]

To standardize the cytological assessment of thyroid nodules, the Bethesda System for Reporting Thyroid Cytopathology (BSRTC) was implemented in 2008. The BSRTC classifies diagnoses into six categories based on their potential of malignancy: nondiagnostic (Class I), benign (Class II), atypia of undetermined significance/follicular lesion of undetermined significance (AUS/FLUS) (Class III), follicular neoplasm/oncocytic cell neoplasm (Class IV), suspicious for malignancy (Class V), and malignant (Class VI).[11-12] Although cytological screening has reduced the requirement for diagnostic surgery for TNs, many patients still require surgery for a definite histological diagnosis.[13] The American Thyroid Association (ATA) defines thyroid nodules as discrete lesions inside the thyroid gland that are radiologically different from the surrounding parenchyma.[14] Diagnosing benign STN prevents needless surgery and reduces morbidity and costs associated with indiscriminate treatment for all TNs.[15] Small nodules positioned away from sensitive tissues such as the trachea are frequently asymptomatic. While in some patients, thyroid nodules may produce symptoms such as shortness of breath or hyperthyroidism (overactive thyroid).[16] The study aimed to analyze the clinicopathological characteristics of thyroid nodules in a sample of Iraqi patients, as well as their available diagnostic and therapeutic options.

2-PATIENTS AND METHODS

After obtaining ethical approval from the ethical committee of Nineveh Health directorate. A cross-sectional study of recorded data from the department of general surgery at Hamdanyia General Hospital, from January 2024 to the end of December 2024. Parents provided written consent for participating in this study.

The study included 50 subjects initially diagnosed with solitary thyroid nodule. Complete history and physical examination were taken from all of them as well as laboratory tests (including thyroid function tests), preoperative imaging, FNAC results, management, and final histological diagnosis. To aspirate cytological samples, a disposable plastic syringe with a 10-milliliter volume and a fine, 22-gauge needle were utilized.

Statistical analysis: Data from clinical examinations, lab investigations, and outcome measures were recorded, documented, and analyzed in Microsoft Excel. Data were entered into SPSS version 30.0, a statistical analysis tool for social sciences. Scale variables were reported as mean and standard deviation and compared using parametric testing.

3. RESULTS

The study includes 50 patients with the mean age ± standard deviation of the study participants was 36.21 ± 9.11 years. Moreover; male: female was 1:2.84. Furthermore; the majority of the patients were aged less than 30 years. In addition to that; the majority of patients had painless cervical swelling. As shown in table 3.1.

Table 3.1: Patients' basic information (Number = 50 patients).

Variable	Number = 50	Percent
Patient age (years):		
- Less than 30	14	28%
- 30-39	13	26%
- 40-49	11	22%
- 50-59	7	14%
- More than 60	5	10%
Sex:		
- Female	37	74%
- Male	13	26%
Chief Complaint:		
- Painless neck swelling	41	82%
- Difficult swelling	6	12%
- Dyspnea	2	4%
- Palpable lymph node	1	2%

Figure 3.1 shows distribution of the study participants according to their thyroid function. It's evident that the majority of patients had normal thyroid function, followed by low thyroid function and then elevated thyroid function.

Figure 3.1: Distribution of the study participants according to their thyroid function test

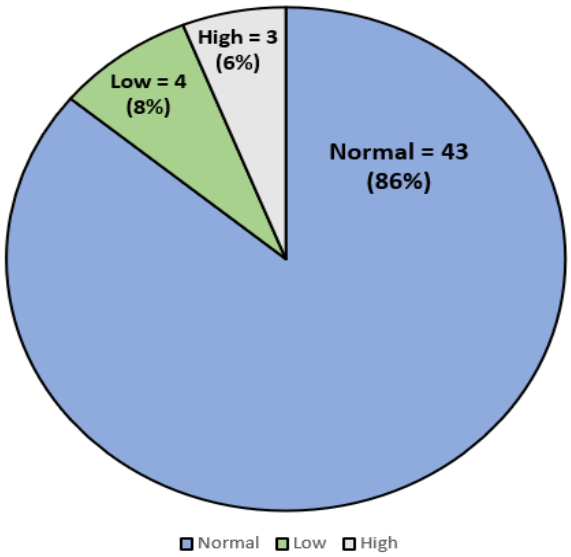

Figure 3.2 shows distribution of the study participants according to their ultrasound findings. Among females, 28 (75.67%) patients had solid mass and 9 (24.33%) patients had cystic mass. While among males, 10 (76.92%) patients had solid mass and 3 (23.08%) patients had cystic mass.

Figure 3.2: Distribution of the study participants according to their Ultrasound findings by gender

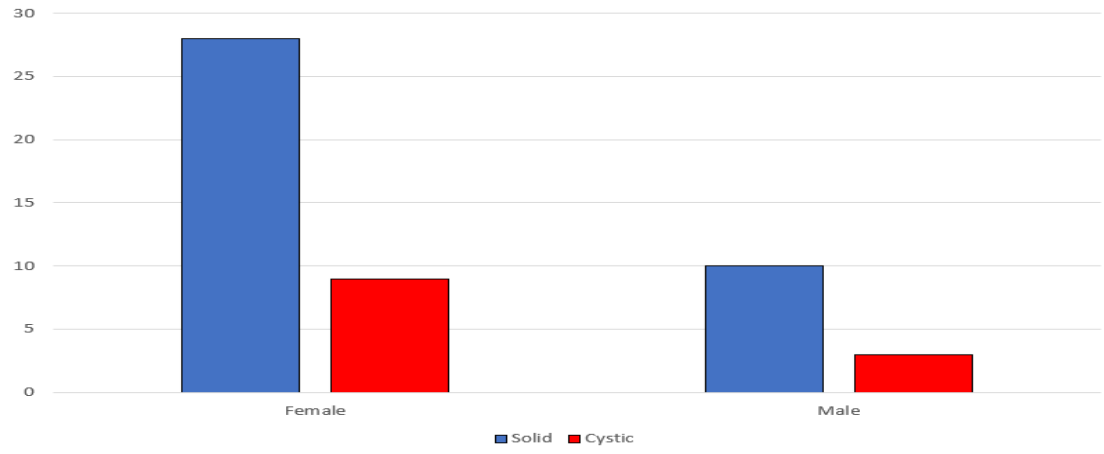

Table 3.2 shows distribution of the study participants according to their received surgery. The majority of patients did lobectomy plus isthmusectomy (62%) followed by bilateral subtotal thyroidectomy (20%).

Table 3.1: types of surgery (Number = 50 patients).

Types of surgery:	Number = 50	Percent
- Total thyroidectomy	5	10%
- Bilateral Subtotal Thyroidectomy	10	20%
- Lobectomy + isthmusectomy	31	62%
- Isthmusectomy	2	4%
- Nodulectomy	1	2%
- Aspiration only	1	2%

Table 3.3 shows distribution of the study participants according to their cytological and histopathogical findings. The majority of patients had benign cytological findings (82%) and colloid nodules (80%).

Table 3.3: Distribution of the study participants according to their cytological and histopathogical findings. (Number = 50 patients).

Variable	Number = 50	Percent
Cytology findings:		
- Benign	41	82%
- Suspicion	2	4%
- Malignant	3	6%
- Insufficient	4	8%
Histopathological findings:		
- Colloid nodule	40	80%
- Follicular adenoma	5	10%
- Follicular carcinoma	2	4%
- Papillary carcinoma	1	2%
- Hashimoto's thyroiditis	2	4%

4. DISCUSSION

The study that the mean age of thyroid nodule was around 36 years, in addition to that more than half of patients (54%) were less than 40 years, which is closed to what was found by Leila Moradi et al[17] and Gustavo Cancela e Penna et al[18] studies' findings. Moreover; Females were found in this study affected by thyroid nodularity 2.84 times than males. Several studies have indeed shown that thyroid nodules are more common in women than in men. For example, one study reported that females affected by thyroid nodularity 2.205 times more than males.[19] Another study found that women were almost four times as likely to have thyroid nodules as men.[20]

The study showed that painless neck swelling was the most common presenting symptoms of thyroid nodule. This finding is runs with Sushma Jagadev et al[21] and Mittal Patel et al[22] studies results. Furthermore; 86% of the study patients were in euthyroid state as indicated by thyroid function results, which is goes with Ahmed E. Elmadani et al study findings.[23] Additionally; In the context of thyroid nodules, it is accurate to say that solid thyroid masses are more common than cystic masses, with solid nodules potentially comprising about three-quarters of cases and cystic nodules the remaining quarter. While most thyroid nodules are benign, solid nodules are more likely to be cancerous than cystic nodules. Rebaz M. Ali et al showed similar findings.[24]

The current study found that the majority of patients did lobectomy plus isthmusectomy (62%) followed by bilateral subtotal thyroidectomy (20%). Lobectomy with isthmusectomy involves removing one thyroid lobe and the isthmus (the connecting tissue between the lobes). Bilateral subtotal thyroidectomy removes a significant portion of both lobes, leaving a small amount of tissue remaining.

While lobectomy and isthmusectomy are common, particularly for benign nodules, the choice of surgical procedure depends on various factors, including the size, location, and characteristics of the nodule, as well as the overall health of the patient and the surgeon's preference. Comparable findings were obtained from Ahmed Johnny Mnati et al[25] study findings.

On the other hand; 82 % of the patients enrolled in this study had benign cytological findings with additional 4% had suspicious malignant cytology and 8% had insufficient results, while only 6% had malignant cytology results, which is approximate to Ana Isabel Álvarez-Mancha et al study results.[26] Lastly; colloid nodules were found in 80% of the study patients which is in agreement with Sushma Jagadev et al study findings.[27]

5-CONCLUSION

Higher incidence of solitary thyroid nodules is likely to occur in women and among those aged less than 40 years. Iraqi people with solitary thyroid nodules has similar clinical and epidemiological features to those from other countries. Most the patients had solid nodules and treated by lobectomy plus isthmusectomy. Most of the cytological and histopathogical results of thyroid nodules were shown to be benign and from colloid nodules.

ACKNOWLEDGEMENT

We are grateful for the help provided by the medical team at Al Hamdanyia general Hospital as well as the careful consideration received from the Nineveh Directorate of Health. Without the help of each of these individuals, this study would not have been possible.

Conflict of intertest

About this study, the authors disclose no conflicts of interest.

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