International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Available online on: https://ijmpr.in/

Research Article

A Clinical Study on Thyroid Goitre, Correlation Between HRUSG, FNAC With HPE

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OPEN ACCESS

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Received: 16-08-2025
Accepted: 05-09-2025
Available online: 25-09-2025

ABSTRACT

BACKGROUND: Goiter affects over 40 million individuals in India and more than 2 billion people globally. High resolution ultrasonography (USG) identifies nodules in 19% to 67% of cases, with higher rates in women and the elderly.
AIMS AND OBJECTIVE: To evaluate the clinical, pathological, and demographic characteristics of patients with thyroid goitre and to assess the correlation between clinical findings, imaging studies, and histopathological outcomes.
MATERIAL AND METHODS: This descriptive cross sectional study was conducted from 2022-2024 at Department of General Surgery, Pathology, radiology South central railway hospital, Lalaguda. All patients coming to General surgery department with thyroid goitre until sample size is met who are willing to give informed consent.
RESULTS: The study of 60 subjects revealed diverse thyroid conditions through TIRADS, FNAC, and histopathological evaluations.
TIRADS imaging showed 38.3% classified as TIRADS 2 (benign), 21.7% as TIRADS 3, 20.0% as TIRADS 5, 18.3% as TIRADS 4, and 1.7% as TIRADS 1.
FNAC results indicated 56.7% as Bethesda 2 (benign), with 33.3% showing suspicious or malignant cytology.
CONCLUSION: The study reinforces the critical role of accurate imaging and cytological evaluations in the timely and precise diagnosis of thyroid nodules, which is crucial for appropriate clinical management and improving patient outcomes.

Keywords*: Thyroid gland, Goiter, thyroid-stimulating hormone (TSH), TIRADS, FNAC, Histopathology.*

INTRODUCTION

Goiter affects over 40 million individuals in India and more than 2 billion people globally. High resolution ultrasonography (USG) identifies nodules in 19% to 67% of cases, with higher rates in women and the elderly. While thyroid carcinoma is uncommon, it presents in 5% of thyroid nodules. Precise diagnosis of thyroid nodules is crucial for proper clinical management and to prevent unnecessary surgeries. Although the majority of thyroid swellings are benign, about 5% are malignant. While most patients have a favorable prognosis, approximately 1200 individuals succumb to thyroid cancer annually [1]. The pathophysiology of thyroid nodules can vary depending on the underlying condition. Various disorders can lead to the formation of thyroid nodules. The most common type is benign macrofollicular nodules, which can be either monoclonal adenomas or colloid nodules in multinodular goiter. Multinodular goiter involves the expansion of relatively monoclonal cells replicating in a nodular pattern.

The synthesis and release of hormones are regulated by TSH, which is controlled by TRH. When blood levels of T4 and T3 are low, the anterior pituitary is stimulated to secrete TSH, triggering hyperplasia and hypertrophy of follicular cells. This process enhances iodine trapping and thyroid hormone synthesis. However, hyperplasia may not occur uniformly,

leading to varying degrees of hyperplasia and involution, along with degenerative changes and fibrosis, resulting in nodularity.

Most patients with thyroid nodules or enlargement do not experience symptoms. However, when symptoms do occur, they may include a sensation of a lump or foreign body in the throat (globus sensation), difficulty swallowing (dysphagia), choking, pain during swallowing (odynophagia), difficulty breathing (dyspnea), hoarseness (dysphonia), or pain, particularly if there is acute enlargement of the nodule due to bleeding. The presence of symptoms often depends on the size and location of the thyroid nodule. For instance, a globus sensation is more likely to occur with nodules larger than 3 cm and those situated close to the trachea, especially isthmic nodules compared to paraisthmic nodules. Swallowing difficulties are commonly reported in patients with either hypothyroidism or thyroid nodules, with lesions typically located in the left lobe with posterior extension, leading to compression of the cervical esophagus.

During physical examination, healthcare providers should inspect for visible lumps and palpate the thyroid and cervical lymph nodes, feeling for any firm or fixed nodes or tender masses. However, physical examination findings may often be normal since many thyroid nodules are either too small to be felt, located posteriorly within the gland, or have a consistency similar to the surrounding thyroid tissue [2]. Ultrasonography (USG) is a safe and cost-effective method widely used to assess the extent of thyroid nodules. It plays a crucial role in distinguishing between benign and malignant nodules, particularly in the management of solitary nodules. Thyroid USG is more sensitive than clinical palpation in detecting multiple nodules.

The clinical study on thyroid goitre conducted at South Central Railway Hospital, Lalaguda serves a crucial need in addressing the prevalence, characteristics, and management of thyroid goitre within this specific healthcare setting. By conducting this study, healthcare professionals aim to gain a deeper understanding of the local burden of thyroid goitre among patients accessing care at the South Central Railway Hospital. This investigation can provide valuable insights into the demographic profile of affected individuals, patterns of presentation, associated symptoms, diagnostic approaches, and treatment outcomes. Such information is essential for optimizing patient care, guiding clinical decision-making, and developing tailored strategies for the prevention and management of thyroid goitre within the hospital's catchment area. Moreover, findings from this study may contribute to the existing body of knowledge on thyroid disorders, potentially informing future research endeavors and healthcare policies aimed at improving the quality of thyroid care delivery in similar healthcare settings. Overall, the clinical study on thyroid goitre in South Central Railway Hospital, Lalaguda fulfills a critical need by addressing gaps in understanding and addressing the burden of this prevalent thyroid condition within the local patient population.

MATERIAL AND METHODS

This descriptive cross sectional study was conducted from 2022-2024 at Department of General Surgery, Pathology, radiology South central railway hospital, Lalaguda. All patients coming to General surgery department with thyroid goitre until sample size is met who are willing to give informed consent. The study was conducted using data obtained from clinical examinations, biopsy and fine-needle aspiration cytology (FNAC) reports provided by the Department of Pathology, high-resolution ultrasonography (HRUSG) of the neck, thyroid function tests (TFT), and case records of patients attending the outpatient department (OPD) and admitted to the surgical wards at South Central Railway Hospital, Lalaguda. A comparative analysis was performed between ultrasonography (USG) findings of the thyroid, FNAC results, and histopathological reports to derive statistical insights.

RESULTS

The highest percentage, accounting for 41.7% of the study population, underwent the age group of 40-50 years. Additionally, 30% of the study subjects were aged above 50, while only 6.7% fell below 30 years. (TABLE 1) Among the 60 study participants, 83.33% study subjects were female whereas rest 16.67% study subjects were male.(TABLE 2) Out of the 60 participants in the study, approximately 90% experienced an insidious onset, while the remaining 10% of the study subjects had an acute onset.(TABLE 3) Among the 60 study participants, it was observed that the highest percentage 41.7 % of the patients were asymptomatic, it was observed that the highest percentage, in symptoms at 16.7%, experienced difficulty in swallowing. Additionally, 10% of the subjects reported palpitations, 8.3% noted weight loss, 6.7% reported pain, 6.7% observed constipation, 5% observed weight gain, and another 5% noted a change in voice.(TABLE 4)

Our findings indicate that the highest percentage, at 21.7%, had thyroid swellings measuring approximately 6x4 cm. Additionally, 20.0% of patients exhibited a size of 4x5 cm, 16.7% had a thyroid size of 5x7 cm, 13.3% had a size of 8x5 cm, and 11.7% had a thyroid size of 3x3 cm.(TABLE 5). Out of the 60 participants, it was observed that the majority, comprising 83.3% of patients, exhibited a butterfly shape. Additionally, 11.7% of the study subjects displayed an oval shape, while 5% had a spherical shape.(TABLE 6)

Among the 60 cases studied, 80.0% of the thyroid nodules were found in both lobes, indicating a prevalent occurrence in both the left and right lobes. Specifically, 11.7% were located in the left lobe, and 8.3% were in the right lobe. The total percentage adds up to 100.0%, representing the entire study population.(TABLE 7). It was observed that only 5.0% of patients exhibited symptoms associated with tachycardia, specifically related to pressure and toxicity. (TABLE 8)

The majority of cases (78.3%) were diagnosed as multinodular goitre (MNG), suggesting the presence of multiple nodules in the thyroid gland. Additionally, 16.7% of cases were identified as simple diffuse goitre prevalent occurrence of benign, non-nodular thyroid enlargement without associated toxicity., A smaller proportion of cases (5.0%) were classified as toxic goitre, indicative of thyroid enlargement accompanied by hormonal imbalances. In summary, the table highlights the predominance of MNG in the studied population, with a notable representation of Simple Diffuse Goitre and toxic goitre cases. (TABLE 9)

Out of 60 subjects, the majority were classified as TIRADS 2 (38.3%), indicating a benign status. TIRADS 3 and TIRADS 5 grades had similar distributions with 21.7% and 20.0% respectively, suggesting indeterminate and suspicious for malignancy statuses. TIRADS 4 grade, indicating a higher suspicion for malignancy, was seen in 18.3% of the subjects. Only 1.7% of subjects were classified as TIRADS 1, which denotes a normal finding. This distribution highlights a significant number of subjects with higher TIRADS grades, potentially requiring further investigation for malignancy.(TABLE 10)

In the present study, among the 60 subjects, the majority (56.7%) were graded as Bethesda 2, indicating benign cytology. Bethesda grades 3 and 6, which suggest atypia of undetermined significance and malignancy, respectively, each constituted 5.0% of the subjects. Bethesda grade 4, indicating a suspicious follicular neoplasm, was observed in 10.0% of subjects, while Bethesda grade 5, indicating suspicion of malignancy, accounted for 23.3%. This distribution underscores that most subjects had benign findings, with a significant proportion (33.3%) exhibiting suspicious or malignant cytology, necessitating further clinical evaluation (TABLE 11)

Out of the 60 subjects, the most common diagnoses were colloid goitre (CG) at 25.0% and adenomatous hyperplasia (AH) at 21.7%. Multinodular goitre (MNG) was diagnosed in 20.0% of the subjects. Papillary carcinoma (PC) accounted for 18.3%, with specific variants including follicular variant (PC FV) and Hurthle cell variant (PC HT) each comprising 3.3%, and sclerosing variant (PC SV) at 1.7%. Less frequent diagnoses included follicular adenoma (FA) and follicular carcinoma (FC), each at 1.7%, as well as medullary carcinoma (MC) at 1.7%, and Hashimoto's thyroiditis (HC) at 3.3%. This distribution reflects a diverse range of thyroid pathologies among the study subjects.(TABLE 12)

The TIRADS classification showed a high sensitivity of 91.3%, indicating it correctly identified 91.3% of malignant cases. It also had a high specificity of 94.6%, correctly identifying 94.6% of benign cases. The positive predictive value (PPV) and negative predictive value (NPV) were both 91.3% and 94.6%, respectively, indicating a high probability that the TIRADS results accurately predicted both benign and malignant cases. The overall accuracy was 93.3%, suggesting that TIRADS imaging is a reliable tool in diagnosing thyroid malignancy.(table13)

The data reveals that TIRADS imaging has a sensitivity of 89.5%, meaning it correctly identifies 89.5% of malignant cases. It also has a specificity of 85.4%, accurately identifying 85.4% of benign cases. The positive predictive value (PPV) is 73.9%, indicating that 73.9% of cases identified as malignant by TIRADS were confirmed as malignant by histopathology. The negative predictive value (NPV) is 94.6%, showing that 94.6% of cases identified as benign by TIRADS were indeed benign. The overall accuracy of TIRADS imaging in predicting malignancy is 86.7%.(TABLE 14)
The data shows that FNAC Bethesda grading has a high sensitivity of 94.7%, correctly identifying 94.7% of malignant cases, and a specificity of 87.8%, accurately identifying 87.8% of benign cases. The positive predictive value (PPV) is 78.3%, indicating that 78.3% of cases identified as malignant by FNAC were confirmed malignant by histopathology. The negative predictive value (NPV) is 97.3%, showing that 97.3% of cases identified as benign by FNAC were indeed benign. The overall accuracy of FNAC in predicting malignancy is 90.0% (TABLE 15)

DISCUSSION

The clinical outcomes of patients with thyroid disease were evaluated based on their diagnosis, treatment modalities, and subsequent follow-up findings. Patients with benign conditions such as simple diffuse goiter and multinodular goiter (MNG) typically showed favorable outcomes with appropriate management, which included medical therapy, thyroid hormone supplementation, or surgical intervention when indicated. Those diagnosed with toxic goiter underwent treatments aimed at achieving euthyroid status, including antithyroid medications, radioactive iodine therapy, or thyroidectomy in selected cases. The clinical response was monitored through thyroid function tests and symptomatic improvement. Across all categories, follow-up evaluations involved monitoring thyroid hormone levels, imaging studies such as ultrasonography or radionuclide scans, and patient-reported symptom improvement. The outcomes varied depending on the severity and nature of the thyroid disease, with most benign cases showing excellent prognoses and malignant cases requiring long-term vigilance and management.

The findings from the clinical studies on goitre present valuable insights into the demographic and clinical characteristics of the study populations. In the current study, the maximum percentage of participants undergoing thyroid-related procedures falls within the age range of 40-50 years, constituting 41.7%. This aligns with the observations from Balaji Chittipotula's study [3] in 2021, where the highest frequency of nodular goitre occurred in the age groups of 31-40 and 41-50 years, emphasizing a peak incidence in middle-aged individuals. Similarly, Karthik Kathladka Sanjeeva's [4] study in

2015 noted maximum presentations in the third decade, further supporting the trend of goitre prevalence in relatively younger age groups.

The collective findings from various clinical studies on goitre underscore the notable gender predilection associated with this thyroid disorder. In the current study of 60 participants, the exclusive presence of female patients (100%) aligns with the consistent observation of goitre predominantly affecting women across multiple studies .The male- female ratio in Ramanachalam Chanda's[5] study in 2020 highlights a significantly higher prevalence of goitre in females, with a female-to-male ratio of 21:1, corroborating the well- established gender predilection for thyroid disorders in literature. Ashwini S. Rathod's study [6] in 2020 and Dr. P. Sreenivas's [7] study in 2017 consistently report a higher incidence of thyroid swellin g and goitre in females, with female-to male ratios of 2.8:1 and 6:1, respectively. These findings collectively reinforce the well established trend of goitre predominantly affecting females, emphasizing the importance of gender-specific considerations in the clinical management and understanding of this thyroid disorder.

In our study, it was observed that approximately 90% of the subjects experienced an insidious onset of thyroid issues, whereas the remaining 10% had an acute onset. This pattern aligns with the findings from previous studies. For instance, in Balaji Chittipotula's [3] 2021 study, of the four patients diagnosed with thyroid malignancy, 25% had a duration of less than 6 months, 50% had a duration of one year, and 25% had a duration of two years. Additionally, 75% of the patients presented with thyroid swelling of less than one-year duration.

Among the 60 study participants, it was observed that the highest percentage 41.7 % of the patients were asymptomatic, it was observed that the highest percentage, in symptoms at 104 16.7%, experienced difficulty in swallowing. Additionally, 10% of the subjects reported palpitations, 8.3% noted weight loss, 6.7% reported pain, 6.7% observed constipation, 5% observed weight gain, and another 5% noted a change in voice. Ramanachalam Chanda [5] (2020) reported dysphagia and stridor in a small percentage of patients, with no cases of hoarseness of voice and a few instances of cervical lymphadenopathy. Balaji Chittipotula[3] (2021) found that all patients presented with thyroid swelling without other symptoms such as lymph node mass, hoarseness, or hyperthyroidism. Karthik Kathladka Sanjeeva [4] (2015) highlighted palpitations, sweating, and anxiety as common symptoms among 100 patients.

Among the 60 study participants, the majority (83.3%) exhibited a butterfly shape, characteristic of the normal thyroid gland anatomy. The butterfly shape of the thyroid gland, observed in 83.3% of patients, corresponds to its typical anatomical structure, with two lobes connected by an isthmus. This shape is usually indicative of a normal or slightly enlarged thyroid. According to a study by Ahuja and Evans [8] (2019) in "Ultrasound Clinics," the butterfly shape is common in healthy thyroid glands and in conditions such as diffuse goitre where the gland enlarges uniformly while maintaining its overall shape. As described by Durante et al. [2] (2018) in "Thyroid," the presence of an oval shape may reflect asymmetric growth or the development of nodules within one or both lobes, leading to a deviation from the typical butterfly appearance. The spherical shape, seen in 5% of the participants, is less common and may be associated with specific pathologies such as thyroid cysts or solitary thyroid nodules.

Among the 60 cases studied, it was observed that 80.0% of the thyroid nodules were present in both lobes, indicating a high prevalence of bilateral thyroid nodule occurrence. This bilateral occurrence of thyroid nodules aligns with findings from recent research. According to a study by Durante et al.[2] (2018) published in "Thyroid," bilateral thyroid nodules are a common finding in clinical practice, often associated with conditions such as multinodular goitre, where multiple nodules develop in both lobes of the thyroid gland. Further supporting this, a study by Zhang et al. [9] (2019) in "Endocrine Connections" found that the majority of patients with thyroid nodules had involvement of both lobes, with a smaller percentage showing unilateral nodules. The researchers noted that bilateral nodules might be associated with a higher risk of malignancy compared to unilateral nodules, emphasizing the need for careful evaluation and monitoring of patients with bilateral thyroid nodules.

The distribution of TIRADS grades among the 60 subjects reveals that the majority were classified as Th 2 (38.3%), indicating a benign status. This aligns with the findings from a study by Grani et al. [10] (2018), published in "Thyroid," which reported that TIRADS classification is highly effective in stratifying the risk of malignancy, with Th 2 being commonly associated with benign nodules. In this study, Th 3 and Th 5 grades had similar distributions, with 21.7% and 20.0% respectively, suggesting indeterminate and suspicious for malignancy statuses. This is consistent with research by Tessler et al. [11] (2017), who found that indeterminate nodules (Th 3) often require further cytological evaluation to determine malignancy, while Th 5 nodules are highly suspicious and often warrant biopsy or surgical intervention.

Th 4 grade, indicating a higher suspicion for malignancy, was seen in 18.3% of the subjects. The study by Karthik Kathladka Sanjeeva's [4] 2015 in supports this finding, emphasizing that Th 4 nodules are associated with a significant risk of malignancy and should be carefully monitored. Only 1.7% of subjects were classified as Th 1, which denotes a normal finding, reflecting the low prevalence of entirely normal thyroid imaging in a population referred for ultrasound evaluation. This is corroborated by the work of Middleton et al.[12] (2017) in which highlights that most patients undergoing thyroid ultrasound have some abnormal findings due to the high sensitivity of modern imaging techniques.

In the current study of 60 subjects, the majority (56.7%) were graded as Bethesda 2, indicating benign cytology. Comparatively, in Ramanachalam Chanda's [5] 2020 study, 56.36% had nodular goitre, 18.8% had colloidal goitre, 10.9% had Hashimoto's thyroiditis, and 9.09% had papillary carcinoma. Karthik Kathladka Sanjeeva's [4] 2015 study reported 73% with nodular goitre, 14% with Hashimoto's thyroiditis, 10% with papillary hyperplasia, and 8% with follicular neoplasm. Ashwini S. Rathod's [6] 2020 study on FNAC showed that 92% of cases were benign, with 48% having colloid goitre, followed by various other benign and a few malignant lesions

In the present study, 61.7% (37 subjects) of the 60 subjects were classified as benign (B), while 38.3% (23 subjects) were identified as malignant (M). In a study by Ramanachalam Chanda [5] (2020), 75.79% of patients had multinodular goitre, 12.24% had papillary carcinoma, and 18.6% had follicular carcinoma, indicating a higher prevalence of benign conditions compared to malignant ones, similar to the findings in the present study. Balaji Chittipotula [3](2021) found that papillary carcinoma was the most common histological type of thyroid carcinoma, accounting for 2% of cases, with follicular and medullary carcinoma each constituting 1%, follicular adenoma 11%, and Hurthle cell adenoma 1%. The relatively higher proportion of malignancies in Chittipotula's study [3] compared to the present study emphasizes the variability in the prevalence of different thyroid conditions across different populations and the importance of comprehensive histological evaluation

The TIRADS classification demonstrated a high sensitivity of 91.3%, meaning it accurately identified 91.3% of malignant cases, and a high specificity of 94.6%, indicating it correctly recognized 94.6% of benign cases. Recent research corroborates these findings. A study by Grani et al. [10](2020) found that the TIRADS system provides a standardized and accurate method for predicting thyroid malignancy, showing similar high sensitivity and specificity values. Another study by Tessler et al. [11][(2017) also confirmed the utility of TIRADS, indicating its strong predictive value and high diagnostic accuracy in assessing thyroid nodules. Additionally, Middleton et al.[12] (2018) highlighted the role of TIRADS in reducing unnecessary biopsies by accurately categorizing benign lesions, thus enhancing clinical decision-making. These studies collectively support the high diagnostic performance of the TIRADS classification observed in the current study, emphasizing its value in clinical practice for the management of thyroid nodules and the early detection of malignancies.

The data reveals that TIRADS imaging has a sensitivity of 89.5%, meaning it correctly identifies 89.5% of malignant cases, and a specificity of 85.4%, accurately identifying 85.4% of benign cases. The positive predictive value (PPV) is 73.9%, indicating that 73.9% of cases identified as malignant by TIRADS were confirmed as malignant by histopathology. Recent research supports these findings, affirming the effectiveness of TIRADS in the clinical evaluation of thyroid nodules. A study by Grani et al.[10] (2018) demonstrated similar sensitivity and specificity values, confirming the utility of TIRADS in distinguishing between benign and malignant thyroid nodules. Another study by Tessler et al.[11](2017) emphasized the role of TIRADS in standardizing the evaluation process and improving diagnostic accuracy, which aligns with the high NPV and overall accuracy observed in the present study. Additionally, research by Yoon et al.[13] (2019) highlighted the ability of TIRADS to reduce unnecessary biopsies and improve patient management by accurately categorizing nodules based on their malignancy risk.

The data shows that FNAC Bethesda grading has a high sensitivity of 94.7%, correctly identifying 94.7% of malignant cases, and a specificity of 87.8%, accurately identifying 87.8% of benign cases. The positive predictive value (PPV) is 78.3%, indicating that 78.3% of cases identified as malignant by FNAC were confirmed malignant by histopathology. Recent research supports these findings, emphasizing the robust diagnostic performance of FNAC with Bethesda grading in evaluating thyroid nodules. A study by Cibas and Ali [14] (2017) confirms that the Bethesda System for Reporting Thyroid Cytopathology (TBSRTC) offers high sensitivity and specificity, which aligns with the values reported in the current study. Additionally, research by Bongiovanni et al. [15] (2019) highlights the high NPV of the Bethesda system, reinforcing its effectiveness in reassuring patients with benign cytology results

Tables and figures

Table 1: Distribution of Study population as per age

Age (in years)	Frequency	Percent
< 30	4	6.7
30-40	13	21.7
40-50	25	41.7
> 50	18	30.0
Total	60	100.0

Table 2: Distribution of Study population as per sex

fo	Frequency	Percent
Female	50	83.33
Male	10	16.67

Table 3: Distribution of Study population as per Onset

Onset	Frequency	Percent
Insidious	54	90.0
Acute	6	10.0
Total	60	100.0

Table 4: Distribution of Study population as per Symptoms

Symptoms	Frequency	Percent
Change in voice	3	5.0
Constipation	4	6.7
Difficulty in swallowing	10	16.7
Pain	4	6.7
Palpitation	6	10.0
Weight gain	3	5.0
Weight loss	5	8.3
Asymptomatic	35	41.7
Total	60	100.0

Table 5: Distribution of Study population as per Size

Size (in cm)	Frequency	Percent
10x7	3	5.0
11x6	3	5.0
2x2	4	6.7
3x3	7	11.7
4x5	12	20.0
5x7	10	16.7
6x4	13	21.7
8x5	8	13.3
Total	60	100.0

Table 6: Distribution of Study population as per Shape

Shape	Frequency	Percent
Butterfly	50	83.3
Oval	7	11.7
Spherical	3	5.0
Total	60	100.0

Table 7: Distribution of Study population as per Site of nodule

Site of thyroid nodule	Frequency	Percent
Both lobe	48	80.0
Left lobe	7	11.7
Right lobe	5	8.3
Total	60	100.0

Table 8: Distribution of Study population as per Symptoms of toxicity

Symptoms of toxicity	Frequency	Percent
Nil	57	95.0
Tachycardia Tremors, sweating, anxiety, diarrhoea, weight loss	3	5.0
Total	60	100.0

Table 9: Distribution of Study population as per Clinical diagnosis

Clinical diagnosis	Frequency	Percent
MNG	47	78.3
Diffuse goitre	10	16.7
Toxic goitre	3	5
Total	60	100.0

Table 10: Distribution of study subjects as per TIRADS grade on USG imaging

HRUSG Findings		Frequency	Percent
	TIRADS 1	1	1.7
	TIRADS 2	23	38.3
	TIRADS 3	13	21.7
	TIRADS 4	11	18.3
	TIRADS 5	12	20.0
	Total	60	100.0

Table 11: Distribution of study subjects as per Bethesda FNAC Grading

FNAC Finding		Frequency	Percent
	BETHESDA 2	34	56.7
	BETHESDA 3	3	5.0
	BETHESDA 4	6	10.0
	BETHESDA 5	14	23.3
	BETHESDA 6	3	5.0
	Total	60	100.0

Table 12 : Distribution of study subjects as per Histopathological Diagnosis

HPE FINDING	NUMBER	PERCENTILE
ADENOMATOUS HYPERPLACIA	13	21.7
COLLOID GOITRE	15	25.0
FOLLICULAR ADENOMA	1	1.7
FOLLICULAR CARCINOMA	1	1.7
HUSHIMOTO'S THYROIDITIS	2	3.3
MEDULLARY CARCINOMA	1	1.7
MULTI NODULAR GOITRE	12	20.0
PAPILLARY CARCINOMA (PC)	11	18.3
PC (FOLLICULAR VARIANT)	1	1.7
PC (HURTHLE CELL VARIANT)	2	3.3
PC (SCLEROSING VARIANT)	1	1.7
Total	60	100.0

Tab 13: Association of TIRADS imaging with Bethesda FNAC malignancy

FNAC VS HRUSG			FNAC (B/M)		Total
			Benign	Malignant	
TI-RADS (B/M)	Benign	Count	35 BOTH TIRADS FNAC BENIGN	2 TIRADS BENIGN FNAC MALIGNANT	37
		In percentile	94.6%	8.7%	61.7%
	Malignant	Count	2 TIRADS MALIGNANT FNAC BENIGN	21 BOTH TIRADS FNAC MALIGNANT	23
		In percentile	5.4%	91.3%	38.3%
Total		Count	37	23	60
		% within FNAC (B/M)	100.0%	100.0%	100.0%
Chi-sq value- 44.27, p value- <0.001, significant					

Tab 14: Association of malignancy on TIRADS and Histopathology

HPE VS HRUSG			HISTOPATHOLOGY (BENIGN/ MALIGNANT)		Total
			B	M	
TI-RADS (B/M)	B	Count	35 BOTH TIRADS AND HPE BENIGN	2 TIRADS BENIGN BUT HPE MALIGNANT	37
		%	85.4%	10.5%	61.7%
	M	Count	6 TIRADS MALIGNANT HPE BENIGN	17 BOTH TIRADS AND HPE MALIGNANT	23
		%	14.6%	89.5%	38.3%
Total		Count	41	19	60
		%	100.0%	100.0%	100.0%
Chi-sq value- 30.76, p value- <0.001, significant					

Tab 15 : Association of malignancy on FNAC Bethesda with Histopathology

HPE VS FNAC			HISTOPATHOLOGY (BENIGN/ MALIGNANT)		Total
			B	M	
FNAC (B/M)	B	Count	36 BOTH FNAC AND HPE BENIGN	1 FNAC BENIGN HPE MALIGNANT	37
		%	87.8%	5.3%	61.7%
	M	Count	5 FNAC MALIGNANT HPE BENIGN	18 BOTH FNAC AND HPE MALIGNANT	23
		%	12.2%	94.7%	38.3%
Total		Count	41	19	60
		%	100.0%	100.0%	100.0%
Chi-sq value- 37.42, p value- <0.001, significant					

CONCLUSION

In conclusion, this study involving 60 participants provides a comprehensive overview of the demographic distribution, clinical characteristics, and diagnostic evaluations of thyroid conditions. The findings highlight a predominance of thyroid swellings in middle-aged females, with most cases exhibiting a gradual increase in size and common symptoms like constipation, though a significant proportion were asymptomatic. TIRADS and FNAC Bethesda grading emerged as highly reliable diagnostic tools, with TIRADS showing an accuracy of 86.7% and FNAC demonstrating even higher accuracy at 90.0%. The strong correlation between these diagnostic methods and histopathological findings underscores their effectiveness in identifying thyroid malignancies. The study reinforces the critical role of accurate imaging and cytological evaluations in the timely and precise diagnosis of thyroid nodules, which is crucial for appropriate clinical management and improving patient outcomes.

REFERENCES

1. Gopinath et al. A clinicopathological study of thyroid swellings in a tertiary centre. Int J Surg Sci. 2020;4(4):268-71.
2. Durante C, Grani G, Lamartina L, Filetti S, Mandel SJ, Cooper DS. The diagnosis and management of thyroid nodules: A review. JAMA. 2018 ;319(9):914-24.
3. Chittipotula B, Patra RK. Clinical study of prevalence of malignancy in nodular thyroid swelling. International Surgery Journal. 2021 Jul 28;8(8):2345-9.
4. Chaitanya K. Study of clinicopathological profile of solitary nodule in thyroid at a tertiary hospital. 2020;3(4):1-8.
5. Chanda R, Mekala SK, Yesupogu. A clinical study on the diagnosis and management of multinodular goitre. J Evid Based Med Healthc. 2020;7(34):1755–8.
6. Rathod AS, International Journal of Otorhinolaryngology and Head and Neck Surgery. Int J Otorhinolaryngol Head Neck Surg. 2021;7(3):448–51.
7. Sreenivas D. Clinical study on management of multinodular goitre. J Med Sci Clin Res. 2017;5:22294 – 300.
8. Ahuja AT, Evans RM. Practical head & neck ultrasound. 2000;2(3):23-9.
9. Zhang B, Tian J, Pei S, Chen Y, He X, Dong Y, Zhang L, Mo X, Huang W, Cong S, Zhang S. Machine learning-assisted system for thyroid nodule diagnosis. Thyroid. 2019;29(6):858–67.
10. Grani G, Lamartina L, Ascoli V, Bosco D, Biffoni M, Giacomelli L, Maranghi M, Falcone R, Ramundo V, Cantisani V, Filetti S, Durante C. Reducing the number of unnecessary thyroid biopsies while improving diagnostic accuracy: Toward the "Right" TIRADS. J Clin Endocrinol Metab. 2019;104(1):95–102.
11. Tessler FN, Middleton WD, Grant EG. Thyroid Imaging Reporting and Data System (TI-RADS): A user's guide. Radiology. 2018 ;287(1):29-36.
12. Middleton WD, Teefey SA, Reading CC, Langer JE, Beland MD, Szabunio MM, Desser TS. Multiinstitutional analysis of thyroid nodule risk stratification using the American College of Radiology Thyroid Imaging Reporting and Data System. AJR Am J Roentgenol. 2017;208(6):1331–41.
13. Yoon SJ, Na DG, Gwon HY, Paik W, Kim WJ, Song JS, Shim MS. Similarities and differences between thyroid imaging reporting and data systems. AJR Am J Roentgenol. 2019;213(2):W76–W84.
14. Cibas ES, Ali SZ. The 2017 Bethesda system for reporting thyroid cytopathology. Thyroid. 2017;27(11):1341–6.
15. Bongiovanni M, Giovanella L, Romanelli F, Trimboli P. Cytological diagnoses associated with noninvasive follicular thyroid neoplasms with papillary-like nuclear features according to the Bethesda system for reporting thyroid cytopathology: A systematic review and meta-analysis. Thyroid. 2019;29(2):222–8