

## ORIGINAL RESEARCH

# Assessment of correlation of ultrasound and cytological findings in thyroid neoplasms using TIRADS and Bethesda system

<sup>1</sup>Dr. Babu Suresh G, <sup>2</sup>Dr. B. Roshni Sumalini, <sup>3</sup>Dr. Diddi Vamshi Kiran,

<sup>1</sup>Assistant Professor, Department of Radiodiagnosis, Malla Reddy Medical College for Women Suraram, Hyderabad, Telangana, India

<sup>2</sup>Assistant Professor, Department of Pathology, Kamineni Academy of Medical Sciences and Research Centre L.B. Nagar, Telangana, India

<sup>3</sup>Assistant Professor, Department of Radiodiagnosis, Prathima Institute of Medical Sciences, Telangana, India

### Corresponding author

Dr. Babu Suresh G

Assistant Professor, Department of Radiodiagnosis, Malla Reddy Medical College for Women Suraram, Hyderabad, Telangana, India

Email: [babusuresh5480@gmail.com](mailto:babusuresh5480@gmail.com)

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### ABSTRACT

**Background:** Thyroid nodules are highly frequent, and the method used to diagnose them has a significant impact on prevalence rates. The present study was conducted to assess correlation of ultrasound and cytological findings in thyroid neoplasms using TIRADS and Bethesda system.

**Materials & Methods:** 56 patients who have thyroid nodule in B-mode ultrasound and are scheduled to get an FNACof both genders were staged according to TIRADS. FNAC results are followed up for the Bethesda staging.

**Results:** Out of 56 patients, males were 26 and females were 30. Age group 25-34 years comprised of 4, 35- 44 years 16, 45-54 years 22 and >55 years 14 patients. The difference was significant ( $P < 0.05$ ). Out of 32 TIRADS 2 nodules, 0 turned to be higher than Bethesda 4 (malignant). Out of 16 TIRADS 2 nodules, 2 were in Bethesda 1, 7 in 2, 1 in 3 and 1 in 4. Out of 6 TIRADS 4 nodules, 1 was in Bethesda 1, 3 in 2, 1 in 4, 2 in 5 and 1 in 6. Out of 2 TIRADS 5 nodules, 1 was in Bethesda 1, 1 in 2, 2 in 4, 3 in 5 and 2 in Bethesda 6.

**Conclusion:** A considerable degree of confidence can be placed in the likelihood that a thyroid nodule is malignant if the TIRADS system is used by US to classify thyroid nodules correctly. Initiating the proper care of the nodule can be done without the need for unnecessary FNA procedures.

**Key words:** Thyroid nodules, Bethesda, TIRADS

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### INTRODUCTION

Thyroid nodules are highly frequent, and the method used to diagnose them has a significant impact on prevalence rates. When using imaging techniques like the high-resolution ultrasonogram, the prevalence rate in the adult population ranges from 20 to 76% as opposed to just 4 to 7% when determined solely by palpation.<sup>1</sup> The nodules found by radiography investigations are referred to as "thyroid incidentalomas." Between 50 and 65% of the time, there is a link between imaging techniques and the prevalence reported after surgery and autopsies.<sup>2</sup> With the extensive use of different imaging modalities, such as computed tomography (CT), magnetic resonance imaging (MRI), and ultrasound (US), the detection of thyroid nodules has considerably

increased.<sup>3</sup> The prevalence of thyroid nodules is anticipated to rise as imaging tools become more adept at detecting tiny lesions. Nearly 70% of the population is found to have at least one tiny nodule, according to modern high-resolution imaging techniques. The US characteristics of thyroid nodules don't always match up with the cytological findings, which causes inconsistencies and muddle in treatment regimens.<sup>4</sup> TIRADS is a classification system based on ultrasound features which was basically introduced to allow for a better selection of thyroid nodules undergoing FNAC, thus avoiding unnecessary procedures.<sup>5</sup> This system also unifies language between radiologists and endocrinologists all over the world.<sup>6</sup> The present study was conducted to assess correlation of ultrasound and cytological findings in

thyroid neoplasms using TIRADS and Bethesda system.

**MATERIALS & METHODS**

The present study consisted of 56 patients who have thyroid nodule in B-mode

The present study consisted of 56 patients who have thyroid nodule in B-mode ultrasound and are scheduled to get an FNAC of both genders. All gave their written consent to participate in the study. Data

such as name, age, gender etc. was recorded. The patient is made to lie supine. The ultrasound examination starts with B-mode to image the thyroid and the neck. The thyroid nodules, if present, are staged according to TIRADS. The neck is assessed for suspicious lymph nodes. Then FNAC results are followed up for the Bethesda staging. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

**RESULTS**

**Table: I Distribution of patients**

<b>Total- 56</b>		
<b>Gender</b>	<b>Male</b>	<b>Female</b>
Number	26	30

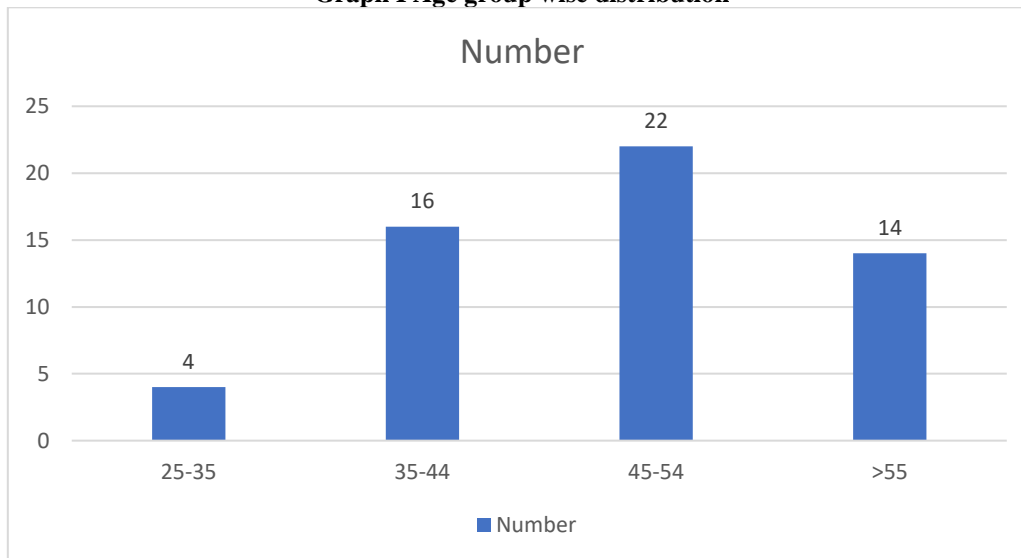
Table I shows that out of 56 patients, males were 26 and females were 30.

**Table: II Age group wise distribution**

Age group (years)	Number	P value
25-35	4	0.0
35-44	16	
45-54	22	
>55	14	

Table II, graph I shows that age group 25-34 years comprised of 4, 35- 44 years 16, 45- 54 years 22 and >55 years 14 patients. The difference was significant (P< 0.05).

**Graph I Age group wise distribution**



**Table : III Thyroid imaging reporting and data system and bethesda correlation**

	Bethesda 1	Bethesda 2	Bethesda 3	Bethesda 4	Bethesda 5	Bethesda 6	Total
TIRADS 2	8	20	1	0	0	0	32
TIRADS 3	2	7	1	1	0	0	16
TIRADS 4	1	3	0	1	2	1	6
TIRADS 5	1	1	0	2	3	2	2
Total	12	30	2	4	5	3	56

Table III shows that out of 32 TIRADS 2 nodules, 0 turned to be higher than Bethesda 4 (malignant). Out of 16 TIRADS 2 nodules, 2 were in Bethesda 1, 7 in

2, 1 in 3 and 1 in 4. Out of 6 TIRADS 4 nodules, 1 was in Bethesda 1, 3 in 2, 1 in 4, 2 in 5 and 1 in 6.

Out of 2 TIRADS 5 nodules, 1 was in Bethesda 1, 1 in 2, 2 in 4, 3 in 5 and 2 in Bethesda 6.

## DISCUSSION

The right indication for when and which nodules should be submitted to fine-needle aspiration cytology (FNAC) is still up for dispute. There has been debate concerning the malignant traits that emerge over the past 20 years, but no clear classification has been established.<sup>7</sup> Researchers are attempting to establish a correlation between the various methods of staging thyroid nodules as a result of the uncertainty around the numerous classifications in the many modalities.<sup>8</sup> The frequency of incidental diagnoses of thyroid nodules is rising daily as a result of the widespread use of ultrasound, the improved accessibility to cytology analysis through fine-needle aspiration cytology (FNAC) guided by ultrasound, and the most recent developments in functional imaging modalities, such as 18 FDG-PET imaging. Given that the majority of nodules are often benign, it is debatable whether or not such a benefit exists.<sup>9,10</sup> The present study was conducted to assess correlation of ultrasound and cytological findings in thyroid neoplasms using TIRADS and Bethesda system. We found that out of 56 patients, males were 26 and females were 30. Age group 25-34 years comprised of 4, 35- 44 years 16, 45- 54 years 22 and >55 years 14 patients. Periakaruppan G et al<sup>11</sup> tried to correlate the TIRADS and Bethesda system for reporting thyroid cytopathology. This study includes 184 patients. Patients having thyroid nodule in B-mode ultrasound and are scheduled to get a fine-needle aspiration cytology (FNAC) done. Out of the 117 TIRADS 2 nodules, none turned out to be Bethesda IV or higher, which means none of these nodules turned out to be malignant. The risk of malignancy for TIRADS 2, TIRADS 3, TIRADS 4, and TIRADS 5 was 0, 2.2, 38.5, and 77.8%, respectively. The risk of malignancy percentage in our study is similar to those values obtained in other prominent studies. We found that out of 32 TIRADS 2 nodules, 0 turned to be higher than Bethesda 4 (malignant). Out of 16 TIRADS 2 nodules, 2 were in Bethesda 1, 7 in 2, 1 in 3 and 1 in 4. Out of 6 TIRADS 4 nodules, 1 was in Bethesda 1, 3 in 2, 1 in 4, 2 in 5 and 1 in 6. Out of 2 TIRADS 5 nodules, 1 was in Bethesda 1, 1 in 2, 2 in 4, 3 in 5 and 2 in Bethesda 6. Alshaikh R et al<sup>12</sup> assessed correlations between US and cytological findings in the diagnosis of thyroid nodules. The radiologic characteristics from US showed positive features largely for the composition (76.2%) and vascularity (59.3%). Very few showed echogenicity (6.9%). Most records indicated negatively for the shape (94.7%), margins (76.2%), echogenicity (63.5%), or echogenic foci (66.1%). Of the 47 cases in TIRADS 1 and 2, only two were found to be Bethesda 4 classification, showing that most of these nodules

were benign. Among those with TIRADS 3 on US, 85% turned were benign (Bethesda 2), two of the remaining six were grade 3, and the other four were suspiciously malignant. Of the 100 cases in TIRADS 4 and 5, 63% were of Bethesda grade 2, and therefore, benign, 14% were mildly suspicious, and only 23% were in Bethesda grades 4-6. A significant positive correlation was noted between the TIRADS and Bethesda scores. The limitation of the study is small sample size.

## CONCLUSION

Authors found that a considerable degree of confidence can be placed in the likelihood that a thyroid nodule is malignant if the TIRADS system is used by USG to classify thyroid nodules correctly. Initiating the proper care of the nodule can be done without the need for unnecessary FNA procedures.

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