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Correlation between Ultrasound - Based Tirads and Bethesda System for Reporting Thyroid - Cytopathology

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Abstract: ***In recent times, high - resolution ultrasound thyroid imaging has paved the way for significant transformation in clinical approach to thyroid nodule. There are several risk stratification systems in thyroid imaging, developed with an aim, not only to reduce the inter - observer variability but also to establish effective communication system. Thyroid image reporting and data system (TIRADS) classification system, which is similar to breast imaging reporting and data system for breast lesion, is the most useful of all.***

Keywords: ultrasound, thyroid imaging, nodules, risk stratification, TIRADS classification

1. Introduction

The prevalence of thyroid nodules by palpation is 3%–8% and by ultrasound (US) is 20%–76% in general population. [1] The incidence of thyroid cancer has been increasing worldwide in the last few decades. [2] This increase is almost exclusively attributed by papillary thyroid carcinoma than other histological subtypes of thyroid carcinoma. [3, 4]Solitary thyroid nodule is a radiologically distinct discrete lesion with different echogenicity from surrounding thyroid parenchyma. Although US detects thyroid nodules more precisely, it differentiates benign from malignant lesion less accurately. Solid compositions, microcalcification, irregular margin, hypo - echogenicity, taller than wide shape, absent halo, and an increase in blood flow are the characteristic findings of malignancy in US.

Based on the already existing breast imaging reporting and data system (BI - RADS) for breast nodule, an US - guided thyroid imaging reporting and data system (TIRADS) has been proposed for risk stratification of thyroid nodules to improve categorical management using this efficient low - cost measure. [5] Fine needle aspiration (FNA) cytology plays a vital role in the initial diagnostic workup of solitary thyroid nodules. Evaluation and categorization can be improved by incorporating strategic system proposed by the latest revised Bethesda System for Reporting of Thyroid cytopathology (BSRTC - 2017). [6] In spite of its intra and inter observer variability, pathologists worldwide are comfortable with this protocol. The Bethesda System classifies thyroid FNA findings into six categories with specific malignancy risks and guides in making further therapeutic decisions.

Thyroid nodules

The American Thyroid Association defined thyroid nodules as “discrete lesions within the thyroid gland, radiologically distinct from surrounding thyroid parenchyma.” [10]

The literature indicates that the incidence of nodules is around four times higher in women than men. [2] The gender disparity is perhaps explained by the hormonal influences of both estrogen and progesterone, as increasing nodule size and new nodule development have been demonstrated to be related to pregnancy and multiparity. [11]

The nodules may cause thyroid dysfunction and may rarely cause compressive symptoms due to mass effect. The nodules are critical because of the need to rule out thyroid malignancy.

Thyroid Imaging Reporting and Data System

To facilitate interpretation and standardization among specialists, recently a standardized system for analysing and reporting thyroid ultrasound and for risk stratification (thyroid Imaging Reporting and Data System [TIRADS]) was proposed, following the BIRADS system widely used for mammography. According to this system, thyroid nodules can be categorized in six different risk groups according to their ultrasonographic characteristics:

- TIRADS 1: normal thyroid gland.
- TIRADS 2: benign conditions (0% malignancy), including simple cyst, spongiform nodules, and isolated macrocalcifications.
- TIRADS 3: probably benign nodules (80%).
- TIRADS 6: biopsy - proven malignant nodules.

2. Materials and Method

A prospective study design of 30 patients collected from May 2022 to November 2022. Patients detected with thyroid nodule on ultrasound underwent FNAC. The thyroid nodules are staged according to TIRADS. Then FNAC results were followed up for the Bethesda staging. Finally the correlation of TIRAD Study design

Inclusion criteria:

Patients who have thyroid nodule in B - mode ultrasound and are scheduled to get an FNAC done are included in this study.

Exclusion criteria:

No exclusion criteria

Research question:

Microcalcifications in TIRADS and its association with thyroid carcinoma?

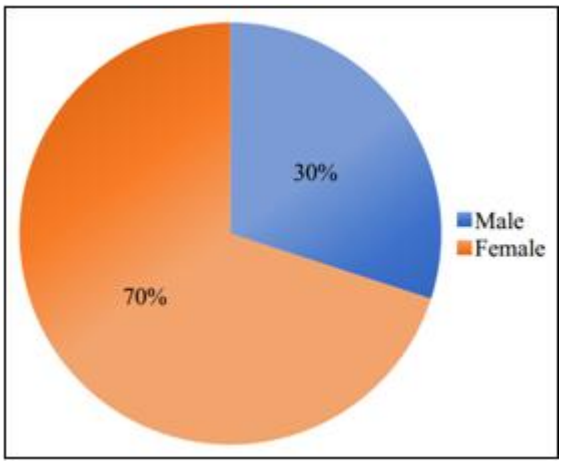
To correlate the TIRADS with BETHESDA.

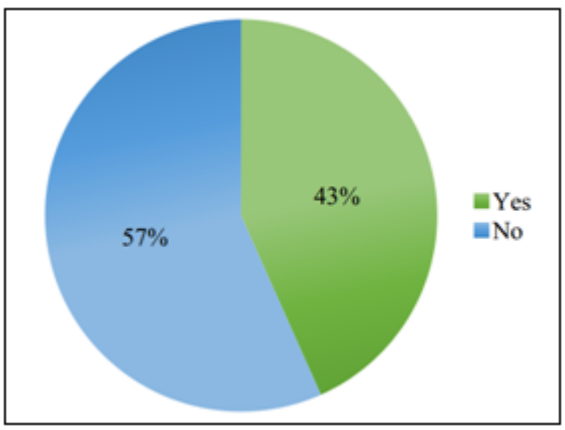
Aims and objectives:
To classify the patients according to TIRADS AND BETHESDA.

To compare the efficacy of TIRADS and Bethesda in differentiating benign from malignant nodules.

3. Results

Out of 30 patients studied, 70% and 30 % were females and males respectively. Of which belongs to TIRADS 2 (36.7%), 3 (26.7%), 4 (33.3%) and 5 (3.3%) and BETHESDA 1 (3.3%), 2 (63.3%), 3 (13.3%), 4 (10%), 5 (6.7%) and 6 (3.3%) respectively. Microcalcifications were noted in 43.3% of patients. Of 11 (36.7%) patients with benign nodules in TIRADS, 10 patients were benign and 1 malignant on BETHESDA and 11 (36.7%) patients with malignant nodules in TIRADS, 8 (33%) were benign and 3 (50%) malignant in BETHESDA. By statistical calculation, there was no significant correlation (p value - 0.613). Out of 13 (43.3%) patients with microcalcifications, 8 (33.3%) were benign and 5 (83.3%) malignant and 17 (56.7%) patients without calcifications, 16 (66%) were benign and 1 (16.7%) malignant in BETHESDA.





4. Conclusion

Higher BETHESDA and TIRADS scoring were associated with increased malignancy risk. Combined use of TIRADS and BETHESDA are useful in predicting risk of malignancy.

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