Diyala Journal of Medicine

ORIGINAL RESEARCH
Published: 25 June 2024
Doi: 10.26505/DJM.26028500423

Correlation Between the Thyroid Imaging Reporting and Data System and Bethesda System of Cytology in Thyroid Nodule Evaluation

Jamal Omer Bahabara [1],Ahmed Salem Basabaa [2] , Abeer Mohammed Bin Thalab[3],Sameer Yeslam Baothman[4], Mohammed Khamis Alakbary[5], Nabeel Salim Musiaan[6]

[1,4,5]Department of specialized surgery- college of medicine and health sciences- Hadramout University - Mukalla- Hadramout - Yemen
[2,6]Department of medicine- College of medicine and health sciences- Hadramout University - Mukalla- Hadramout – Yemen
[3]Department of basic medical siences- college of medicine and health sciences- Hadramout University - Mukalla- Hadramout – Yemen

Abstract

Background: Accurate diagnosis of thyroid nodules is important for avoiding unnecessary surgeries and allowing timely treatment. Ultrasound and fine needle aspiration cytology (FNAC) are the most commonly used diagnostic procedures.

Objective: To correlate ultrasonography with the FNAC report findings using the American College of Radiology Thyroid Imaging Reporting and Data System (ACR TI-RADS) and the Bethesda System for Reporting Thyroid Cytopathology (TBSRTC) in differentiating malignant from benign thyroid nodules.

Patients and Methods: A prospective study conducted from January 2021 to January 2024 assessed 103 cases of thyroid nodules who underwent ultrasound examination and fine needle aspiration. Ultrasonography findings were analyzed and correlated with FNA cytology reports based on ACR-TIRADS and BSRTC.

Results: Patients were predominantly female, n = 87 (84.4%). Most of the patients were in the 31–40 year group (n = 55, 53.39%). Most of the patient nodules had TIRADS 3 (n = 59, 57.28%), followed by TIRADS 2 (n = 20, 18.44%). When comparing the ACR TI-RADS scoring system with the TBSRTC, the percentage of malignancy for TR1, 2, 3, 4, and 5 was 0, 0, 1.6, 80, and 89%, respectively. In our study, the overall sensitivity and specificity of the TIRADS score were 94.11% and 96.51%, respectively. PPV: 84.21%; NPV: 98.80%; and accuracy: 96.11%. In addition, there was a significant association between TIRADS and the Bethesda system of classification ($P < 0.001$).

Conclusion: ACR-TIRADS scoring is highly sensitive and accurate for diagnosing thyroid malignant nodules. It is a sensitive tool and could be used alone to determine the nature of thyroid nodules.

Keywords: Thyroid malignancies, Ultrasonography, Yemen

OPEN ACCESS

Correspondence: Jamal Omer Bahabara
Email: j.bahabara@hu.edu.ye

Website: https://djm.uodiyala.edu.iq/index.php/djm

Received: 23 April 2024
Accepted: 5 June 2024
Published: 25 June 2024

ORIGINAL RESEARCH
Published: 25 June 2024
Doi: 10.26505/DJM.26028500423

Introduction

Thyroid nodule is a common medical problem with about 5 % of population had a nodule on clinical examination and about 50 to 67 % of those underwent ultrasound [1]. Elderly patients are more prone to thyroid malignancies, and males are at more risk, although nodules are more common in females [2]. Approximately 5–15% of patients with thyroid nodules has thyroid cancer [3]. The prevalence of thyroid cancer among patients with thyroid nodules in the Arab world varies and reported to be 10.5% in Jordan [4], 5% in Saudi Arabia in one study [5] and 10.4% in another [6] and 14.9% in Diyala, Iraq [7]. In Yemen, the prevalence of thyroid cancer was 17.7% of patients with goiter in one study [8] and in another study; its prevalence was higher than other Middle Eastern countries with a higher rate of follicular thyroid cancer than that in other published data in one study [9]. Ultrasound is an important imaging tool for discovering and assessing a thyroid lesion. More importantly, ultrasound can be combined with FNAC to enhance the diagnostic accuracy in the differentiation of benign from malignant nodules [10]. Neck ultrasound remains the most widely used technique for discovering nodules, and sonographic features like margins, calcifications, echogenicity, and vascularity are used to determine the potential risk of malignant nodules. However, US an operator-dependent method, so its use is limited by the technical skill of the operator [11]. TIRADS classification is an ultrasound-based scoring system that allows for a precise selection of a nodule to be aspirated, avoiding unnecessary surgery [12]. This system eases the cross-talk between radiologists and endocrinologists worldwide.

FNAC is a crucial technique in determining the need and extent of surgery. FNAC should be reported in a uniform system among pathologists to pave the road for physicians to make a clear decision [13]. FNAC provides a reliable, cost-effective and robust diagnostic outcome; so, it is the gold standard for diagnosing thyroid nodules [14]. FNA has high sensitivity and specificity in differentiation malignant from benign thyroid lesions. However, it is nondiagnostic in 2–16% of cases and indeterminate in a further 5–20% [15]. Reporting of FNA cytology has improved in the past 10 years with the introduction of classification schemes in order to standardize terminology, to facilitate communication among cytopathologists, endocrinologists and surgeons, and to provide the malignancy risk for specific diagnostic categories [15].

The Bethesda System for Reporting Thyroid Cytopathology (BSRTC) contains six categories for reporting FNAC. It was developed in 2010 and revised in 2017, and is now widely used as a diagnostic tool in thyroid pathology [16]. TBSRTC has been widely adopted in the United States and in many places worldwide and has been endorsed by the American Thyroid Association [17]. It has improved communication and provided a uniform template for sharing data among investigators [16].

The aim of the work is to To the best of our knowledge, there is no study comparing TIRADS with BSRTC in our country, so we decided to conduct a study among Yemeni

ORIGINAL RESEARCH
Published: 25 June 2024
Doi: 10.26505/DJM.26028500423

patients referred for US-guided FNA of thyroid masses.

Patients and Methods

This study was an analytical, prospective study conducted in the Bahabara medical radiology center in Mukalla city, Yemen, between January 2021 and January 2024. 103 subjects with thyroid mass were included in the study; these subjects were referred from outpatient's clinics to the center for thyroid ultrasound and FNAC.

Thyroid ultrasound

Conventional thyroid ultrasound and color Doppler were done while the patients were in a supine position, and a probe with a frequency of 12 MHz was used. An experienced radiologist who had more than a decade of experience in the thyroid field performed ultrasonography.

Image analysis

Each nodule was assessed for characteristic features like microcalcification, margins, echogenicity, composition, and shape. Cervical lymph nodes were examined as well. According to ACR TI-RADS, thyroid nodules are categorized as benign, minimally suspicious, moderately suspicious, or highly suspicious for malignancy. Figure 1 shows the characteristic features used to calculate the TIRADS score, which are interpreted as follows: the higher the number of points, the more suspicious for malignancy. TIRADS scores 1 to 3 were considered benign, while other scores were considered positive for malignancy [18].

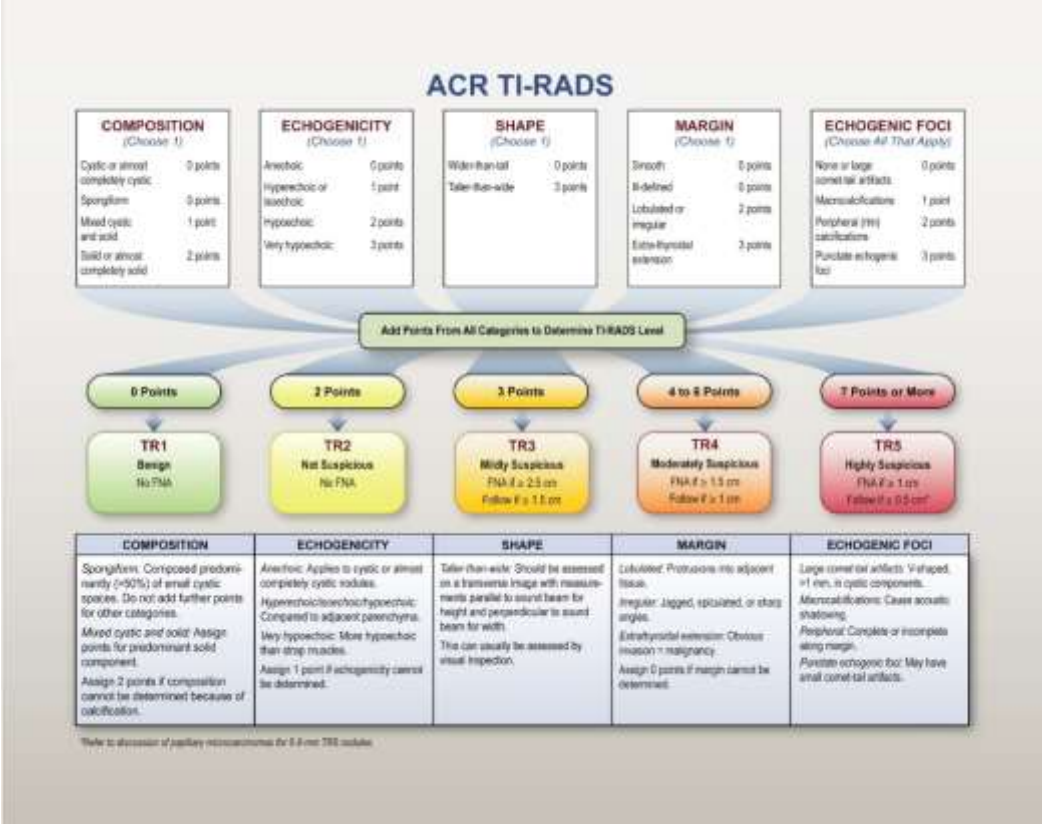

Figure (1): TIRADS categories of thyroid nodules and size of nodule threshold to perform FNA [18].

ORIGINAL RESEARCH
Published: 25 June 2024
Doi: 10.26505/DJM.26028500423

Ultrasound-guided FNAC of nodules

FNA was performed following a standard technique by a needle of 23-gauge and freehand technique under US guidance. The same highly expert pathologist did the histopathological evaluation, and the cytological findings of every patient were classified according to the 2017 BSRTC [19], every single patient after giving him the cytopathology report was ordered to go to the doctor who asked for FNAC; in turn, he took a copy of the report and send it back to the corresponding author, who correlated between the patient's report and the ACR TI-RADS system Table (1).

Table (1): The Bethesda System for Reporting Thyroid Cytopathology 2017

Category	Meaning
I	Non-diagnostic or unsatisfactory
II	Benign
III	Atypia/follicular lesion of undetermined significance
IV	Follicular neoplasm or suspicious for follicular neoplasm
V	Suspicious for malignancy
VI	Malignant
Adapted from ref 8	

Statistical Analysis

The statistical package for social sciences (SPSS version 25) was used to summarize the data numerically (mean, standard deviation, and median) and graphically (frequency tables and graphics). Sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of ACR TI-RADS were calculated for US findings based on FNAC results. $P \leq 0.05$ was considered significant for all statistical analyses.

Results

In this study, most of the patients were female, 84.4% (n = 87). Most of the patients were in the age group of 31–40 years (53.39%; n = 55), ranging from 17 – 54 years Figure (2) and Table (2).

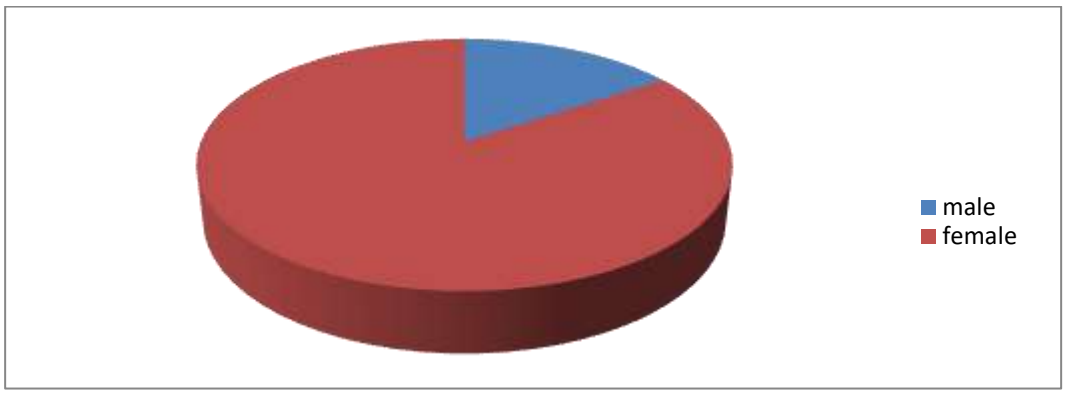

Figure (2): Gender distribution of the participants.

ORIGINAL RESEARCH
Published: 25 June 2024
Doi: 10.26505/DJM.26028500423

Table (2): Showing the age groups of the participants.

Age	Number of patients	%
≤ 30 y	15	14.56%
31-40	55	53.39%
41-50	36	34.95%
> 51	7	6.79%

The size of the nodules in our study ranged from 7 mm to 48 mm. solid or almost solid constituted about 57.7% (n = 56), the majority of them were wider than tall (93.20%; n = 96), and had smooth margins of 89.3% (n = 92). About echogenicity, 78.64% (n = 81) were hyperechoic or isoechoic, and 79.11% (n = 82) had no echogenic foci Table (3).

Table (3): Ultrasound features of thyroid nodules based on ACR TI-RADS.

ACR-TIRADS based on	Number (103)	%
Composition		
Cystic/almost completely cystic	5	4.85
Spongiform	0	00
Mixed cystic and solid	42	40.7
Solid/ almost solid	56	57.7
Shape		
Wider than tall	96	93.20
Taller than wide	7	6.79
Echogenicity		
Anechoic	5	4.85
Hyperechoic or isoechoic	81	78.64
Hypoechoic	14	13.59
Very hypoechoic	3	2.91
Margins		
Smooth	92	89.3
Ill defined	6	89.32
Lobulated/ irregular	5	4.85
Extra thyroid extension	0	0
Echogenic foci		
None/ large comet tail artifact	82	79.61
Macro calcification	9	8.73
Peripheral calcifications	3	2.91
Punctate echogenic foci	9	8.73

The category TR3 was the most common among our patients (57.28%; n = 59), followed by TR2 (19.42%; n = 20), and TR1 was the least frequent one Table (4).

ORIGINAL RESEARCH
Published: 25 June 2024
Doi: 10.26505/DJM.26028500423

Table (4): ACR TI-RADS for sex of patients.

TI-RADS	n	%	MALE	FEMALE
T1	5	4.85%	0	5
T2	20	19.42%	3	17
T3	59	57.28%	7	52
T4	10	9.71%	5	5
T5	9	8.74%	1	8
Total	103	100%	16	87

Regarding the correlation between ACR TI-RADS and the Bethesda system of thyroid classification scores, we found a moderate correlation ($r = 0.577$). This means that the 5 TIRADS 1 and 20 TIRADS 2 nodules in particular were benign nodules. Regarding the nodules in TIRADS 3, only one was labeled suspicious for follicular neoplasm (Bethesda classification 4), while the remaining 58 nodules were in Bethesda II and 1. The percentage of malignant nodules in our study was 16.5% (n = 17), and the frequency of malignant nodules was higher in nodules with TIRADS scores 4 and 5. The higher the TIRADS classification score, the higher the percentage of malignancy among nodules; TIRADS 4 and 5 carried the highest percentages (80 and 89%, respectively). The comparison between the ACR TI-RADS classification and the TBSRTC demonstrated that the percentage of malignancy for TR1, 2, 3, 4, and 5 was 0, 0, 1.6, 80, and 89%, respectively Table (5).

Table (5): Thyroid Imaging Reporting and Data System (TI-RADS) and Bethesda Correlation.

ACR-TIRADS categorization	BETHESDA system of thyroid classification							
	I	II	III	IV	V	VI	Total n (%)	% of malignancy
TIRADS 1	1	4	0	0	0	0	5(4.8%)	0
TIRADS 2	1	19	0	0	0	0	20(19.41%)	0
TIRADS 3	0	58	0	1	0	0	59(57.28%)	1.6%
TIRADS 4	0	2	0	1	6	1	10(9.70%)	80%
TIRADS 5	0	1	0	0	0	8	9(8.73%)	89%
Total n (%)	2(1.9%)	84(81.6%)	0	2(1.9%)	6(5.8%)	9(5.8%)	103(100%)	

The sensitivity and specificity of ACR TI-RADS calculated based on FNAC results were 94.11% and 96.51%, respectively, while the positive and negative predictive values were 84.21% and 98.8%, respectively. Furthermore, the positive likelihood ratio was 19.62%, the negative likelihood ratio was 0.0585%, and the accuracy was 96.11% Table (6).

ORIGINAL RESEARCH
Published: 25 June 2024
Doi: 10.26505/DJM.26028500423

Table (6): TIRADS classification versus FNAC results cross-tabulation.

TIRADS classification	FNA RESULTS		
	Positive	Negative	
positive			
count	16,(a)true positive	3,false positive(b)	19
% of total	15.53%	2.91%	18.44%
negative			
Count	1 ,false negative(c)	83true negative(d)	84
% of total	0.97%	80.58%	81.55%
total			
Count	17	86	103
%of total	16.5%	83.50%	100%

In our study, the association between TIRADS and the Bethesda system of classification was statistically significant ($P < 0.001$).

Discussion

Thyroid ultrasound is an important, non-invasive technique to determine the nature of thyroid nodules, as there is no sensitive sonographic feature to delineate benign from malignant lesions; ACR-TIRADS was proposed for this task [20]. Our study revealed that female patients were predominant (84.4%) with an average age of late thirties (38y). This is in line with previous studies [21,22, 23], in which the prevalence of thyroid nodules in females was 86%. This could be attributed to sex hormonal influences in females [24]. Our study has shown malignancy risk of 0%, 0%, 1.6%, 80%, and 89%, respectively, for TIRADS categories 1, 2, 3, 4, and 5, which is in line with previous studies [20, 25]. In this study, the sensitivity of TIRADS to discover malignant nodules was 80% and 89% for TIRADS 4 and 5, respectively; this is supported by other validation studies carried out by Horvath et al, Zhang et al, and Xu [26, 27,28]. In our study, TIRADS 3 was the most predominant category; this was in contrast to an Indian study that found TIRADS 2 to be the most prevalent [29]. In spite of this difference between the studies in categorizing thyroid nodules, benign thyroid nodules are still the most prevalent. We demonstrated that nodules in the ACR TI-RADS 3 category had the highest negative predictive value (NPV). This was in line with an earlier study that discovered ACR TI-RADS scores of four or greater had the highest NPV [30]. This might explain the lower malignancy rate in TR3, as individual features like the hyperechoic or isoechoic nature of the nodule are not included as possible features to predict malignancy in the TIRADS system. In our study, the sensitivity of a fine needle aspiration biopsy was 94.11%, which was comparable with the previous studies, but the specificity was 96.51%, which was higher than most of the published series [31-37]. On the other hand, the accuracy of TIRADS in our study was 96.11%, which was higher than what was determined by Nighat (76.1%.) [38], Çolakoğlu, and Deniz (73.6%) [39]. The reason for the high accuracy in our study is possibly because of the high PPV and NPV. Our study revealed that all patients

ORIGINAL RESEARCH
Published: 25 June 2024
Doi: 10.26505/DJM.26028500423

with Bethesda 1 had benign nodules; this was compatible with several previous studies [40-44]. In our study, 1.9% of patients were classified as Bethesda I, of which all their histopathology reports were benign; this was similar to Cibas [19]. Our study demonstrated a strong positive correlation between the Bethesda scoring system and the ACR TI-RADS; our finding was supported by several studies [40-44].

Limitations of the study

The small sample size and using cytopathology results despite their false negative results as a standard reference for comparison are the main limitations of our study.

Conclusions

TI-RADS classification is an important tool in the evaluation of thyroid nodules; it can be used to decide whether FNA is necessary or not. The TIRADS score has high diagnostic accuracy in comparison to the BSRTC. However, further large studies, including those at other centers, are necessary to prove the results of this study.

Recommendations

We do recommend using ACR-TIRADS as an indicator of whether to do FNA or not for thyroid nodules in our community.

Source of funding: The current study was funded by our charges with no any other funding sources elsewhere.

Ethical clearance: The study was approved by the Research Ethics Committee, College of Medicine and Health Sciences, Hadhramout University. Written consent was obtained from all patients before inclusion. This study was conducted according to the approval of College of Medicine/ University of Diyala and in accordance with the ethical guidelines of the Declaration of ethical committee of the College (Document no. 2024JOB850).

Conflict of interest: Nil

References

[1] Gharib H, Papini E, Paschke R. Thyroid nodules: a review of current guidelines, practices, and prospects. Eur J Endocrinol. 2008;159:493–505. https://academic.oup.com/ejendo/article abstract/159/5/493/6676094?redirectedFrom =fulltext&login=false

[2] Sharath Chandra BJ, Choudhary AK, Rajesh R (2020) Comparison of TIRADS [Thyroid imaging reporting and data system] with histopathology in assessment of thyroid nodules. International Journal of Surgery Science 4(1): 26-32. https://www.surgeryscience.com/articles/306/3-4-67-541.pdf

[3] Gao LY, Ying W, Yu-Xin J, et al. Ultrasoud is helpful to differentiate Bethesda class III thyroid nodules a PRISMA-compliant systematic review and meta-analysis. Medicine. 2017;96:165 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5406060/

[4] Abdullah N, Hajeer M, Abudalu L, et al. Correlation study of thyroid nodule cytopathology and histopathology at two institutions in Jordan. Cytojournal. 2018;15:24. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6198704/

[5] Saeed MI, Hassan AA, Butt ME, et al. Pattern of thyroid lesions in Western region of Saudi Arabia: a retrospective analysis and literature review. J Clin Med Res. 2018;10(2):106–116.

ORIGINAL RESEARCH
Published: 25 June 2024
Doi: 10.26505/DJM.26028500423

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5755649/

[6] Al Dawish MA, Robert AA, Aljuboury M, et al. Bethesda system for reporting thyroid cytopathology: a three-year study at a tertiary care referral center in Saudi Arabia. World J Clin Oncol. 2017;8(2):151–157. https://www.wjgnet.com/2218-4333/full/v8/i2/151.htm

[7] Habash M.M, Prevalence of Thyroid Defects in Diyala, Iraq, Medico-legal Update, July-September 2021, Vol.21, No. 3. https://ijop.net/index.php/mlu/article/download/3020/2618/5925

[8] Abudulmughin Y.A. Alhureibi M.A, Alhureibi K.A, Ghafoor M.A, Alwadan A.H, and Alhureibi Y.A, Thyroid cancer in Yemen, Saudi Med J, 2004 Jan;25(1):55-9. https://pubmed.ncbi.nlm.nih.gov/14758381/

[9] Al-Sharafi B. A, AlSanabani J.A, Alboany I.M, and Shamsher A.M; Thyroid cancer among patients with thyroid nodules in Yemen: a three-year retrospective study in a tertiary center and a specialty clinic, Thyroid Res 2020; 13.8; 1-8, https://thyroidresearchjournal.biomedcentral.com/articles/10.1186/s13044-020-00082-x

[10] Rossi ED, Pantanowitz L, Hornick JL. (2021) A worldwide journey of thyroid cancer incidence centered on tumour histology. Lancet Diabetes Endocrinol 9(4):193-194. https://doi.org/10.1016/S2213-8587(21)00049-8

[11] Al-Ghanimi IA, Al-Sharydah AM, Al-Mulhim S, et al (2020) Diagnostic accuracy of ultrasonography in classifying thyroid nodules compared with fine-needle aspiration. Saudi J Med Med Sci 8:25-31. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6945311/

[12]Azab EA, Abdelrahman AS, Ibrahim MEA (2019) A practical trial to use Thyroid Imaging Reporting and Data System (TI-RADS) in differentiation between benign and malignant thyroid nodules. Egyptian J Radiol Nuclear Med 50(1):17. doi.org/10.1186/s43055-019-0020-0. https://ejrnm.springeropen.com/articles/10.1186/s43055-019-0020-0

[13] Modi L, Sun W, Shafizadeh N, et al (2020) Does a higher American College of Radiology Thyroid Imaging Reporting and Data System (ACR TI-RADS) score forecast an increased risk of malignancy? A correlation study of ACR TI-RADS with FNA cytology in the evaluation of thyroid nodules. Cancer Cytopathol 128(7):470–481. https://pubmed.ncbi.nlm.nih.gov/32078249/

[14] Bahaj A.S, Alkaff H.H, Melebari B.N, Melebari A.N, Sayed S.I, Mujtaba S.S, et al, Role of fine-needle aspiration cytology in evaluating thyroid nodules: A retrospective study from a tertiary care center of Western region, Saudi Arabia, Saudi Med J 2020; Vol. 41 (10).

[15] Paschke R, Cantara S, Crescenzi A, Jarzab B, Musholt T.J and Simoes M.S; European Thyroid Association Guidelines regarding Thyroid Nodule Molecular Fine-Needle Aspiration Cytology Diagnostics, Eur Thyroid J 2017;6:115–129. https://etj.bioscientifica.com/view/journals/etj/6/3/ETJ468519.xml

[16] Ali SZ, Baloch ZW, Cochand-Priollet B, et al (2023) The 2023 Bethesda System for Reporting Thyroid Cytopathology. Thyroid 33 (9): 1039-1044. https://doi.org/10.1089/thy.2023.0141

[17] Haugen BR, Alexander EK, Bible KC, Doherty GM, Mandel SJ, Nikiforov YE, et

ORIGINAL RESEARCH
Published: 25 June 2024
Doi: 10.26505/DJM.26028500423

al, 2015 American Thyroid Association management guidelines for adult patients with thyroid nodules and differentiated thyroid cancer: the American Thyroid Association Guidelines Task Force on Thyroid Nodules and Differentiated Thyroid Cancer. Thyroid 26:1–133. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4739132/

[18] Tessler FN, Middleton WD, Grant EG, et al (2017) ACR Thyroid Imaging, Reporting and Data System (TI-RADS): White Paper of the ACR TI-RADS Committee. J Am Coll Radiol 14 (5): 587-595. https://pubmed.ncbi.nlm.nih.gov/37427847/

[19] Cibas ES & Ali SZ (2017) The 2017 Bethesda System for Reporting Thyroid Cytopathology. Thyroid 27 (11):1341-1346. https://pubmed.ncbi.nlm.nih.gov/29091573/

[20] Kwak J, Han K, Yoon J, et al (2011) Thyroid imaging reporting and data system for US features of nodules: A step in establishing better stratification of cancer risk. Radiology 260:892–899. https://pubmed.ncbi.nlm.nih.gov/21771959/

[21] Barbosa T, Junior C, Graf H, et al (2019) ACR TI-RADS and ATA US scores are helpful for the management of thyroid nodules with indeterminate cytology. BMC Endocrine Disorders 19: 112. doi: 10.1186/s12902-019-0429-5. https://bmcendocrdisord.biomedcentral.com/articles/10.1186/s12902-019-0429-5

[22] Muthu S, Saravanakumar R (2019) A prospective study of incidence of malignancy in solitary nodule of thyroid. Int J Contemporary Med Res 6:E24–26. doi.org/10.21276/ijcmr.2019.6.5.29. https://www.ijcmr.com/uploads/7/7/4/6/77464738/ijcmr_2497_v1.pdf

[23] Biswas A, Basu K, De S, et al (2020) Correlation between thyroid imaging reporting and data system and Bethesda system of reporting of thyroid cytopathology of thyroid nodule: a single center experience. J Cytology 37(4):193–199. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7984512/

[24] Thattarakkal VR, Ahmed TSF, Saravanam PK, et al (2022) Evaluation of thyroid nodule: Thyroid Imaging Reporting and Data System (TIRADS) and clinicopathological correlation. Indian J Otolaryngol Head Neck Surg 74(3):5850–5855. https://pubmed.ncbi.nlm.nih.gov/36742631/

[25] Isse HM, Lukande R, Sereke S.G, et al (2023) Correlation of the ultrasound thyroid imaging reporting and data system with cytology findings among patients in Uganda. Thyroid Res 16: 26. doi.org/10.1186/s13044-023-00169-1. https://thyroidresearchjournal.biomedcentral.com/articles/10.1186/s13044-023-00169-1

[26] Horvath E, Silva CF, Majlis S, et al (2017) Prospective validation of the ultrasound based TIRADS (Thyroid Imaging Reporting And Data System) classification: results in surgically resected thyroid nodules. Eur Radiol 27:2619-2628. https://pubmed.ncbi.nlm.nih.gov/27718080/

[27] Zhang WB, Li JJ, Chen XY, et al. (2020) SWE combined with ACR TI-RADS categories for malignancy risk stratification of thyroid nodules with indeterminate FNA cytology. Clin Hemorheol Microcirc 76:381–390. https://pubmed.ncbi.nlm.nih.gov/32675401/

ORIGINAL RESEARCH
Published: 25 June 2024
Doi: 10.26505/DJM.26028500423

[28] Xu X, He XL, Guo LL (2019) The diagnostic value of the maximum value of Young's modulus of shear-wave elastography and ACR TI-RADS for thyroid nodules. Lin Chuang Er Bi Yan Hou Tou Jing Wai Ke Za Zhi 33:764–767. https://pubmed.ncbi.nlm.nih.gov/31446736/

[29] Periakaruppan G, Seshadri KG, Vignesh Krishna GM, et al (2018) Correlation between Ultrasound-based TIRADS and Bethesda system for reporting thyroid-cytopathology: 2-year experience at a tertiary care center in India. Indian J Endocrinol Metabol 22(5):651–655. https://pubmed.ncbi.nlm.nih.gov/30294576/

[30] Schenke S, Klett R, Seifert P, et al (2020) Diagnostic performance of different thyroid imaging reporting and data systems (Kwak-TIRADS, EU-TIRADS and ACR TI-RADS) for risk stratification of small thyroid nodules (≤10 mm). J Clin Med 9(1):236.doi: 10.3390/jcm9010236. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7019412/

[31] Grani G, Lamartina L, Ascoli V, et al (2019) Reducing the Number of Unnecessary Thyroid Biopsies While Improving Diagnostic Accuracy: Toward the "Right" TIRADS. J Clin Endocrinol Metab 104:95-102. https://pubmed.ncbi.nlm.nih.gov/30299457/

[32] Soylemez UO, Gunduz N (2022) Diagnostic accuracy of five different classification systems for thyroid nodules: a prospective, comparative study. J Ultrasound Med 41(5):1125–1136. https://pubmed.ncbi.nlm.nih.gov/34370333/

[33] Magri F, Chytiris S, Croce L, et al (2020) Performance of the ACR TI-RADS and EU TI-RADS scoring systems in the diagnostic work-up of thyroid nodules in a real-life series using histology as reference standard. Eur J Endocrinol 183(5):521–528. https://pubmed.ncbi.nlm.nih.gov/32841935/

[34] Wildman-Tobriner B, Buda M, Hoang JK, et al (2019) Using Artificial Intelligence to Revise ACR TI-RADS Risk Stratification of Thyroid Nodules: Diagnostic Accuracy and Utility. Radiology 292(1):112–119. https://pubmed.ncbi.nlm.nih.gov/31112088/

[35] Clark TJ, McKinney K, Jensen A, et al (2019) Risk Threshold Algorithm for Thyroid Nodule Management Demonstrates Increased Specificity and Diagnostic Accuracy as Compared With American College of Radiology Thyroid Imaging, Reporting and Data System; Society of Radiologists in Ultrasound; and American Thyroid Association Management Guidelines. Ultrasound quarterly 35(3)::224–227. https://pubmed.ncbi.nlm.nih.gov/30724871/

[36] Sahli ZT, Karipineni F, Hang JF, et al (2019) The association between the ultrasonography TIRADS classification system and surgical pathology among indeterminate thyroid nodules. Surgery 165(1):69–74. https://pubmed.ncbi.nlm.nih.gov/30415866/

[37] Li W, Wang Y, Wen J, et al (2021) Performance of American College of Radiology TI-RADS:A Systematic Review and Meta-Analysis. Am J Roentgenol 216:38–47. https://pubmed.ncbi.nlm.nih.gov/32603229/

[38] Nighat S, Zahra M, Javed AM, et al (2021) Diagnostic accuracy of TI-RADS classification in differentiating benign and malignant thyroid nodules-a study from

ORIGINAL RESEARCH
Published: 25 June 2024
Doi: 10.26505/DJM.26028500423

Southern Punjab, Pakistan. Biomedica 37(3):159–163. https://www.researchgate.net/publication/356066853_Diagnostic_accuracy_of_TI-RADS_classification_in_differentiating_benign_and_malignant_thyroid_nodules-a_study_from_Southern_Punjab_Pakistan

[39] Çolakoğlu B, and Deniz A (2019) Single-center validation study of the American College of Radiology Thyroid Imaging Reporting and Data System in a Turkish adult population. The Turkish Journal of Ear Nose and Throat 29: 126-133. https://dergipark.org.tr/tr/pub/trent/issue/66964/1046661

[40] Zloczower E, Atas O, London D, et al (2020) Agreement between Ti-RADS classification and Bethesda cytopathological findings from thyroid nodules in young adults. Mil Med 185:2020–2025. https://pubmed.ncbi.nlm.nih.gov/32691063/

[41] Wu M (2021) A correlation study between thyroid imaging report and data systems and the Bethesda system for reporting thyroid cytology with surgical follow-up: an ultrasoundtrained cytopathologist's experience. Diagn Cytopathol 49:494–499. https://pubmed.ncbi.nlm.nih.gov/33151033/

[42] Merhay G, Zolotov S, Mahagneh A, et al (2021) Validation of TIRADS ACR risk assessment of thyroid nodules in comparison to the ATA guidelines. J Clin Imaging Sci 11:37. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8326070/

[43] Güldoğan SE, Ergun O, Türkmenoğlu TT, et al (2021) The impact of TI-RADS in detecting thyroid malignancies: a prospective study. Radiol Med 126:1335–1344. https://pubmed.ncbi.nlm.nih.gov/34176050/

[44] Huang EYF, Kao NH, Lin SY, et al (2023) Concordance of the ACR TI-RADS Classification With Bethesda Scoring and Histopathology Risk Stratification of Thyroid Nodules. JAMA Netw Open 6 (9): e2331612. doi:10.1001/jamanetworkopen. 2023.31612. https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2809293

Diyala Journal of Medicine

ORIGINAL RESEARCH
Published: 25 June 2024
Doi: 10.26505/DJM.26028500423

مدى تطابق نتائج نظام تيراد التابع للكلية الامريكية للأشعة مع نتائج نظام باثيسدا في تقييم عقيدات الغدة الدرقية

جمال عمر باحباره [١]، احمد سالم باسباع [٢]، عبير محمد بن ثعلب [٣]، سمير يسلم باعثمان [٤]، محمد خميس العكبري [٥]، نبيل سالم مسيعان [٦]

الملخص

خلفية الدراسة: التشخيص الدقيق لعقيدات الغدة الدرقية أمر بالغ الأهمية لتجنب العمليات الجراحية غير الضرورية وتمكين العلاج في الوقت المناسب. استخدام الموجات فوق الصوتية والشفط بالإبرة الدقيقة من الغدة الدرقية (FNAC) من اهم التقنيات التشخيصية.

اهداف الدراسة: لربط علاقة تقارير الموجات فوق الصوتية باستخدام نظام تيراد التابع للكلية الأمريكية للأشعة (ACR TI-RADS) مع نتائج تقارير (FNAC) باستخدام نظام بيثيسدا لتصنيف أمراض الغدة الدرقية (TBSRTC) لتمييزالعقيدات الخبيثة من الحميدة.

المرضى والطرائق: دراسة استطلاعية أجريت في الفترة من يناير ٢٠٢١ إلى يناير ٢٠٢٤ قيمت ١٠٣ من المرضى يعانون من عقيدات الغدة الدرقية وخضعوا للفحص بالموجات فوق الصوتية والشفط بالإبرة الدقيقة. تم تحليل نتائج التصوير بالموجات فوق الصوتية وربطها بتقارير (FNAC)بناءً على ACR-TIRADS وBSRTC.

النتائج: كان المرضى في الغالب من الإناث، العدد = ٨٧ (٨٤,٤٪). كانت معظم عقيدات المرضى تحتوي على TIRADS 3 (ن ٥٩,٥٧,٢٨٪). عند مقارنة تصنيف ACR TI-RADS مع TBSRTC، كانت نسبة الأورام الخبيثة في TR1 و٢ و٣ و٤ و٥ هي ٠ و٠ و١,٦ و٨٠ و٨٩٪ على الترتيب. بلغت الحساسية العامة والنوعية لتقارير صور الغدة الدرقية ونظام البيانات (TIRADS) في دراستنا ٩٤,١١٪ و٩٦,٥١٪-% على الترتيب. وقد لوحظ وجود ارتباط كبير بين نظامي التصنيف TIRADSو بيثيسدا (P <0.001).

الاستنتاجات: يعتبر تصنيفACR-TIRADS حساسًا للغاية ودقيقًا للكشف عن الأورام الخبيثة في عقيدات الغدة الدرقية.

الكلمات المفتاحية: اورام الغدة الدرقية الخبيثة، الموجات فوق الصوتية، اليمن

البريد الالكتروني: j.bahabara@hu.edu.ye

تاريخ استلام البحث: ٢٣ نيسان ٢٠٢٤

تاريخ قبول البحث: ٥ حزيران ٢٠٢٤

[١,٢,٣,٤,٥,٦] كلية الطب - جامعة حضرموت – المكلا - اليمن