ORIGINAL RESEARCH ARTICLE

Correlation between ACR TI-RADS (Thyroid Imaging Reporting and Data System) with fine Needle Aspiration Cytology (FNAC) in the Evaluation of Thyroid Nodules

Monisha V[1], Rajeswari[2], Anil Kumar Sakalecha[3], Uha Sai[4], Lynn Joy[5]

[1]Post Graduate, Department of Radio-diagnosis, [2]Associate Professor, Department of Radio-diagnosis, [3]Professor & HOD, Department of Radio-diagnosis, [4]Post Graduate, Department of Radio-diagnosis, [5]Post Graduate, Department of Radio-diagnosis, Sri Devaraj Urs Academy of Higher Education and Research, India

Corresponding author: Dr.Rajeswari, #185 , 54th cross , 4th block , Rajajinagar , Bangalore , Karnataka - 560010, India

How to cite this article: Monisha V, Rajeswari, Anil Kumar Sakalecha, Uha Sai, Lynn Joy. Correlation between ACR TI-RADS (thyroid imaging reporting and data system) with fine needle aspiration cytology (FNAC) in the evaluation of thyroid nodules. International Journal of Contemporary Medicine Surgery and Radiology. 2022;7(1):A17-A21.

A B S T R A C T

Introduction: The main concern with a thyroid nodule is its potential to turn out to be malignant. Ultrasound thyroid facilities distinction between benign & malignant nodules based on ACR-TIRADS (American College of Radiology -Thyroid Imaging Reporting and Data System) score. FNAC (Fine Needle Aspiration Cytology) has been considered a gold standard for ruling out malignancies. The study's objective was to determine the diagnostic accuracy of the ACR-TIRADS score by correlating it with FNAC results.

Materials and Methods: A hospital-based descriptive observational retrospective study on 50 subjects who underwent ultrasound thyroid with ACR - TIRADS scoring and subsequent FNAC between June 2021 and August 2021. The diagnostic accuracy of TIRADS in differentiating benign from malignant nodules was assessed by cross tabulating and correlating with FNAC results. The coGuide was used for statistical analysis.

Results: The mean age was 50 ± 14 years. The majority (78%) were females. 22% of the nodules were malignant by FNAC, while the Final TI-RADS score identified 32% as malignant. According to the Final TI-RADS score, most nodules were of TR3 (52%) followed by TR5 (18%). The most common histological findings in FNAC were Nodular Hyperplasia (16%) and Lymphocytic Thyroiditis (16%). TIRADS had a sensitivity of 100%, specificity of 87%, and diagnostic accuracy of 90% in detecting malignancy in thyroid nodules compared to FNAC.

Conclusion: ACR-TIRADS scoring system can be used for determining malignancy in thyroid nodules with a higher level of diagnostic accuracy.

Keywords: Ultrasonography, Thyroid Carcinoma, Fine-Needle Aspiration, Thyroid Nodule, Cytology.

INTRODUCTION

Thyroid nodules are very commonly encountered in clinical practice. The main concern of a thyroid nodule is its potential to turn into a malignancy. They are commonly encountered during a physical examination and can be identified during various imaging procedures. A thyroid nodule is a well-defined focal area of altered Echogenicity within the thyroid gland. It is distinct from the surrounding normal thyroid parenchyma [1]. In a large-scale multicenter-based health checkup study, the prevalence of thyroid nodules was reported as 34% in Korea.[2] Thyroid nodules are reported more frequently in women in comparison with men. In India, the prevalence of a palpable thyroid nodule reported from a study was 12.2%.[3] About 5 to 15% of these nodules can turn malignant.[1,4] Fine needle aspiration cytology (FNAC) plays a vital role in the thyroid nodules by estimating the risk of malignancy.[5] There has been a steady increase in the incidence of thyroid malignancies worldwide.[6] Thyroid cancer is the 10th most common incidental cancer globally, contributing to 3% of all new incidental cancers in 2020.[7] Thyroid cancer constituted about 1.5% of all new incidental cancers in India, according to GLOBOCAN 2020. The 5-year prevalence of thyroid cancer is 4 per 1,00,000 population in India.[7] Ultrasound thyroid facilities distinction between benign & malignant nodules based on ACR-TIRADS.[8] (American College of Radiology -Thyroid Imaging Reporting and Data System) score with results comparable to FNAC [5], which is considered a gold standard. ACR-TIRADS scoring system is a non-invasive method with diagnostic accuracy comparable to FNAC for determining malignancy in thyroid nodules. But it is neither cost-effective nor advisable to do FNAC in all thyroid nodules. The TIRADS system of classification correlates sonographic features to cytological classification. TI-RADS is a relatively newer classification system, first introduced by Horvath E et al. and then later modified by ACR based on different features of thyroid nodules on USG.[8-10] Several studies have showed correlation of TIRADS scoring in detecting malignant nodules on par with FNAC.[11-13] The data supporting the diagnostic accuracy

ISSN (Online): 2565-4810; (Print): 2565-4802 | ICV 2019: 98.48 |

of ACR-TI RADS scoring is lacking in the present region for making evidence-based decisions for differentiating malignant from benign tumors. Hence the present study was carried out to determine the diagnostic accuracy of the ACR-TIRADS score by correlating it with FNAC results.

Aim and objectives:

- To describe the morphology of thyroid nodules on ultrasonography.
- To describe the prevalence of malignant nodules on ACR-TIRADS scoring and FNAC, respectively
- To determine the diagnostic accuracy of ACR-TIRADS score for identifying malignant nodules by correlating it with FNAC results.

MATERIALS AND METHODS

A hospital-based observational retrospective study for diagnostic accuracy was done at the Department of Radio-diagnosis, R.L Jalappa hospital and Research Centre, Tamaka, Kolar. The study population included 50 subjects who underwent ultrasound thyroid with ACR - TIRADS scoring and subsequent FNAC for Thyroid nodule in a tertiary care institute between June 2021 to August 2021. The duration of the study was 3 months. Sampling was consecutive. Adult Patients (≥ 18 years) presenting with Thyroid nodules and in whom Ultrasound imaging using TIRADS scoring was done with subsequent FNAC were included in the study from the departmental records. Patients who underwent both ultrasound-based ACR- TIRADS scoring and FNAC were included. Patients in whom USG thyroid report contained only ACR TIRADS score, patients who had a descriptive USG thyroid report without ACR TIRADS scoring, and patients in whom FNAC of the nodule was not carried out were excluded from the study. Data for the study was collected using structured USG neck report data from the available records. The data was gathered from the study participants' history, clinical examination, and investigation reports. The diagnostic accuracy of TIRADS in differentiating benign from malignant nodules was the primary outcome variable. Descriptive analysis was carried out by frequency and proportion for categorical variables and meant and standard deviation/median and IQR for quantitative variables. The diagnostic accuracy was assessed by cross-tabulating and correlating with FNAC results. The coGuide was used for statistical analysis.[14] The present study was cleared by the institutional ethics committee (Ethical clearance number: DMC/KLR/IEC/349/2020-21). There was less than the minimal risk involved to the study subjects as it was only a retrospective observational study. Informed consent was obtained from the study subjects after explaining the study's objectives.

RESULTS

A total of 50 participants were included in the final analysis. The mean age among the study population was 50.08 ± 13.96 years, ranged from 24 years to 78 years. Majority of 39 (78.00%) participants were females. For 17 (34.00%) participants, the right lobe was involved, 18 (36.00%) participants had left lobe involved and 14 (28.00%) participants had both lobes involved. The mean length of largest nodule was 2.99 ± 2.03 cm, ranged from 0.8 cm to 11.5 cm. The mean breadth of largest nodule was 2.32 ± 1.59 cm, ranged from 0.7 cm to 7.5 cm. (Table 1)

Parameter	Summary [N (%)]
Age (Mean ± SD)	50.08 ± 13.96 (24.0, 78.0)
Gender	
Male	11 (22.00%)
Female	39 (78.00%)
Involvement of the lobe	
Right	17 (34.00%)
Left	18 (36.00%)
Both	14 (28.00%)
Isthmus	1 (2.00%)
Single/Multiple	
One	22 (44.00%)
Two	5 (10.00%)
Multiple	23 (46.00%)
Length of largest nodule (in cm) (Mean ± SD)	2.99 ± 2.03 (0.8, 11.5)
Breadth of largest nodule (in cm) (Mean ± SD)	2.32 ± 1.59 (0.7, 7.5)

Table-1: Descriptive analysis of baseline parameters in the study population (N=50)

FNAC Results	Summary [N(%)]
Adenomatoid nodule with cystic change	1 (2.00%)
Anaplastic carcinoma	3 (6.00%)
Benign follicular lesion	5 (10.00%)
Benign follicular lesion - colloid goitre	1 (2.00%)
Colloid goitre	2 (4.00%)
Colloid nodule	1 (2.00%)
Follicular atypia of undetermined significance	1 (2.00%)
Follicular carcinoma	2 (4.00%)
Hashimoto's thyroiditis	5 (10.00%)
Hyalinizing trabecular adenoma	1 (2.00%)
Lymphocytic thyroiditis	8 (16.00%)
Minimally invasive follicular carcinoma (Hurthle cell type)	1 (2.00%)
Nodular goitre	4 (8.00%)
Nodular hyperplasia	8 (16.00%)
Nodular hyperplasia	1 (2.00%)
Nodular hyperplasia with secondary changes	1 (2.00%)
Papillary carcinoma	1 (2.00%)
Papillary thyroid carcinoma	3 (6.00%)
Papillary thyroid carcinoma (Bethesda category V)	1 (2.00%)

Table-2: Descriptive analysis of FNAC results in the study population (N=50)

The FINAC result was Lymphocytic thyroiditis and Nodular hyperplasia for majority of 8 (16.00%) participants each, Hashimoto's thyroiditis, Benign follicular lesion for 5 (10.00%) participants each and anaplastic carcinoma, papillary thyroid carcinoma for 3 (6.00%) participants each. (Table 2)

The type of nodule was benign for 39 (78.00%) participants

and malignant for 11 (22.00%) participants. The composition was solid for 26 (52.00%) participants, predominantly solid for 11 (22.00%) participants, solid-cystic for 10 (20.00%) participants and predominantly cystic for only 3 (6.00%) participants. Echogenicity was either hyperechoic or isoechoic for 21 (42.00%) participants and 19 (38.00%) participants respectively. The shape was wider than taller for most of the 41 (82.00%) participants. Majority of 41 (82.00%) participants had smooth margin and only 1 (2.00%) participant had lobulated margin. Echogenic foci was present for 6 (12.00%) participants and punctate echogenic foci with comet tail artefacts for 2 (4.00%) participants.

The final TIRADS score was TR1 for 1 (2.00%) participant, TR2 for 7 (14.00%) participants, TR3 for 26 (52.00%) participants, TR4 for 7 (14.00%) participants and TR5 for 9 (18.00%) participants. (Table 3)

Table 4 shows that out of the 11 malignant nodules identified by FNAC, majority (72.73%) were classified under TR5. With regards to the 39 benign nodules, 66.67% were classified under TR3 and 17.95% under TR2.

Table 5 shows the comparison of FNAC results with Final TIRADS score. 11 nodules were malignant according to both Final TIRADS scoring and FNAC. Final TIRADS scoring captured all malignant nodules identified by FNAC as malignant. But 5 nodules identified as malignant in Final

Parameter	Summary [N (%)]
Type (FNAC)	
Benign	39 (78.00%)
Malignant	11 (22.00%)
Composition	
Solid	26 (52.00%)
Predominantly solid	11 (22.00%)
Solid – cystic	10 (20.00%)
Predominantly cystic	3 (6.00%)
Echogenicity	
Hyperechoic	21 (42.00%)
Hypoechoic	10 (20.00%)
Isoechoic	19 (38.00%)
Shape	
Wider than taller	41 (82.00%)
Taller than wider	9 (18.00%)
Margin	
Smooth	41 (82.00%)
Irregular	8 (16.00 %)
Lobulated	1 (2.00%)
Echogenic Foci	
Present	6 (12.00%)
Punctate echogenic foci with comet tail artefacts	2 (4.00%)
Macrocalcifications	1 (2.00%)
Punctate calcifications	1 (2.00%)
Nil	41 (82.00%)
Final TIRADS Score	
TR1	1 (2.00%)
TR2	7 (14.00%)
TR3	26 (52.00%)
TR4	7 (14.00%)
TR5	9 (18.00%)
Final TIRADS Score	
Malignant	16 (32%)
Benign	34 (68%)

Table-3: Descriptive analysis of outcome parameters in the study population (N=50)

Final TIRADS Score	FNAC results	
	Malignant (N=11)	Benign (N=39)
TR1	0 (0%)	1 (2.56%)
TR2	0 (0%)	7 (17.95%)
TR3	0 (0%)	26 (66.67%)
TR4	3 (27.27%)	4 (10.26%)
TR5	8 (72.73%)	1 (2.56%)
*No statistical test was applied- due to 0 subjects in the cells		

Table-4: Comparison of final TIRADS score between FNAC results (N=50)

Final TIRADS Score	FNAC	
	Malignant (N=11)	Benign (N=39)
Malignant	11 (100%)	5 (12.82%)
Benign	0 (0%)	34 (87.18%)
*No statistical test was applied- due to 0 subjects in the cells		

Table-5: Comparison of FNAC with final TIRADS score (N=50)

Parameter	Value	95% CI	
		Lower	Upper
Sensitivity	100.00%	71.51%	100.00%
Specificity	87.18%	72.57%	95.70%
False positive rate	12.82%	4.30%	27.43%
False negative rate	0%	0%	28.49%
Positive predictive value	68.75%	41.34%	88.98%
Negative predictive value	100.00%	89.72%	100.00%
Diagnostic accuracy	90.00%	78.19%	96.67%

Table-6: Predictive validity of final TIRADS score in predicting malignancy by FNAC (N=50)

Author	Sample size	Sensitivity	Specificity	Diagnostic accuracy
Present study	50 cases	100%	87.2%	90%
Li W et al[18]	18,614 cases	89%	70%	-
Singaporewalla RM et al[13]	100 cases	70.6%	90.4%	83% (overall concordance rate)
Periakaruppan G et al[11]	184 cases	92.3%	94.2%	-
Mohamed AE et al[19]	20 cases	85.7%	97.7%	96.1%

Table-7: Comparison of Predictive validity of final TIRADS score in predicting malignant nodules by FNAC across studies

ISSN (Online): 2565-4810; (Print): 2565-4802 | ICV 2019: 98.48 |

TIRADS scoring were categorised as Benign by FNAC.
TIRADS had a sensitivity of 100%, specificity of 87% and diagnostic accuracy of 90% in detecting malignancy in thyroid nodules compared to FNAC.

Discussion:

With advances in imaging and the widespread use of ultrasound, thyroid nodules have become a common finding. The majority of the guidelines recommend FNAC for suspicious Thyroid nodules 10 mm or larger in diameter.[8,15] But the risk of cancer in smaller nodules cannot be neglected.[16] There has been an evolution of standardized approaches such as Thyroid Imaging Reporting and Data Systems (TIRADS) for routine use in practice.[8,9] In TIRADS, the risk of a malignancy in a thyroid nodule is determined by scoring the number or the combination of various suspicious ultrasound criteria.[8,17] In the present study, 22% of the nodules were malignant by FNAC compared to 32% by Final TI-RADS scoring. 46% had multiple nodules. The length of the largest nodule was 2.99 cm, while the breadth of the largest nodule was 2.32 cm. TI-RADS scoring system had a sensitivity of 100%, specificity of 87.18%, PPV of 68.75%, and NPV of 100%, with FNAC as the gold standard. The overall diagnostic accuracy of the TIRADS scoring system was 90%. The TIRADS system of classification correlates sonographic features to cytological classification. The sociological features included in our study were the nodule's composition, the shape of the nodule, Echogenicity of the nodule, Echogenicity of the nodule, Margins of the nodule, and Echogenic foci. If the nodules are properly classified on ultrasound, then the TI-RADS system can be used to determine the probability of a nodule being malignant.[11-13] Studies by Singaporewalla RM et al.[13] (2017) and Periakaruppan G et al.[11] (2018) also support the present study results that diagnostic accuracy of TI-RADS scoring is comparable with that of FNAC results. Modi L et al.[12] (2020) in their study observed some correlation between benign cytology diagnoses with lower ACR TI-RADS categories. They observed a greater number of malignant cases in the higher ACR TI-RADS categories. A meta-analysis done on 16 studies with 18,614 patients on a total of 21,882 nodules showed a pooled sensitivity of 89% (95% CI 81% to 93%) and specificity of 70% (95% CI of 60% to 78%).[18] This meta-analysis included cytology results from ultrasound-guided FNA biopsy or surgical resection of the thyroid or both as the reference standard. Mohamed AE et al.[19] (2020) have also shown that ACR-TIRADS scoring is more reliable in detecting malignant nodules than histopathological reports. The comparison of diagnostic accuracy across various studies is shown below in table 7.

Ultrasonography of the thyroid is an excellent modality for evaluating thyroid nodules as it is non-invasive and easily accessible. In clinical practices, it has become the standard initial approach for evaluating thyroid nodules. It facilitates the distinction between benign and malignant nodules based on the composition of the nodule, Echogenicity of the nodule, nodule border or margin, shape of the nodule, the presence of calcifications, and dimensions of the nodule.

Regarding demographic factors in the present study, the mean age was 50 ± 14 years in the present study. It was comparable to other reported studies.[11-13] The majority (78%) of study participants were females. The literature also reported that thyroid nodules more commonly occur in women than men and older age compared to younger age.[2,3] 22% of the nodules were malignant by FNAC compared to 32% by TI-RADS. So in the present study, there is an over-estimation of malignant nodules compared to the other studies. Hence the sensitivity was 100% compared to low sensitivity in other reported studies.[11,13,18] Nevertheless, subjective bias is involved in arriving at a TI-RADS score, which could have resulted in the variation across studies.[11,13] The most common histological findings in FNAC were Nodular Hyperplasia (16%) and Lymphocytic Thyroiditis (16%) in the present study. According to the Final TI-RADS score, most nodules were of TR3 (52%) followed by TR5 (18%). In the study by Singaporewalla RM et al.[13], benign-appearing nodules were reported as TIRADS 2 and 3. They reported Indeterminate or suspected follicular lesions as TIRADS 4, and malignant-appearing nodules as TIRADS 5. It is necessary that clinicians who are involved in performing ultrasound-guided FNAC on the bedside, document their sonographic findings of the nodule in an objective fashion using the TIRADS classification. It can be used to correlate with the cytology reports whenever done so that the results can be audited and excellence can be obtained.

The ACR TI-RADS classification system is a standardized approach to reporting a thyroid nodule on ultrasound and predicting the malignant potential in thyroid nodules, based on multiple ultrasound characteristics and nodule size, using scoring systems. Several modifications of this score exist in several parts of the world. It is a handy tool for predicting and diagnosing malignancy in a thyroid nodule. Being non-invasive, it has the advantage of easy acceptance compared to FNAC. FNAC is a minimally invasive procedure. It is neither cost-effective nor advisable to do FNAC in all subjects with thyroid nodules. Hence, it is essential to select the cases for invasive procedures based on the risk of malignancy provided by the ACR-TIRADS score. The use of high-resolution ultrasound has revolutionized the assessment of thyroid nodules and is readily available to be used routinely.

The present study has a few limitations. The retrospective nature of data collection from reports limits its internal validity, while the small sample size and convenient sampling method limit the generalization of results outside the study population.

CONCLUSIONS

ACR-TIRADS scoring system can be used for determining malignancy in thyroid nodules with a higher level of diagnostic accuracy, comparable to FNAC. FNAC can then be carried out based on the TIRADS score, avoiding the need for FNAC in all subjects with Thyroid nodules. Then appropriate measures for the management of the nodule can be initiated, avoiding unnecessary FNAC procedures.

ACKNOWLEDGMENTS

We acknowledge the technical support in data entry, analysis, and manuscript editing by "Evidencian Research Associates."

REFERENCES

1. Cooper DS, Doherty GM, Haugen BR, Kloos RT, Lee SL, Mandel SJ, et al. Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. Thyroid. 2009;19:1167-214.
2. JH, Hyun MK, Lee JY, Shim JI, Kim TH, Choi HS, et al. Prevalence of thyroid nodules and their associated clinical parameters: a large-scale, multicenter-based health checkup study. Korean J Intern Med. 2018;33:753-762.
3. Usha Menon V, Sundaram KR, Unnikrishnan AG, Jayakumar RV, Nair V, Kumar H. High prevalence of undetected thyroid disorders in an iodine sufficient adult south Indian population. J Indian Med Assoc. 2009;107:72-7.
4. Luo J, Zhang C, Huang F, Chen J, Sun Y, Xu K, et al. Risk of malignancy in thyroid nodules: predictive value of puncture feeling of grittiness in the process of fine-needle aspiration. Sci Rep. 2017;7:13109.
5. Machała E, Sopiński J, Iavorska I, Kołomecki K. Correlation of Fine Needle Aspiration Cytology of Thyroid Gland with Histopathological Results. Pol Przegl Chir. 2018;90:1-5.
6. Sanabria A, Kowalski LP, Shah JP, Nixon IJ, Angelos P, Williams MD, et al. Growing incidence of thyroid carcinoma in recent years: Factors underlying overdiagnosis. Head Neck. 2018;40:855-866.
7. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin. 2021;71:209-249. .
8. Tessler FN, Middleton WD, Grant EG, Hoang JK. Re: ACR Thyroid Imaging, Reporting and Data System (TI-RADS): White Paper of the ACR TI-RADS Committee. J Am Coll Radiol. 2018;15:381-382.
9. Horvath E, Majlis S, Rossi R, Franco C, Niedmann JP, Castro A, et al. An ultrasonogram reporting system for thyroid nodules stratifying cancer risk for clinical management. J Clin Endocrinol Metab. 2009;94:1748-51. .
10. Schenke S, Klett R, Seifert P, Kreissl MC, Görges R, Zimny M. 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. 2020;9:236.
11. Periakaruppan G, Seshadri KG, Vignesh Krishna GM, Mandava R, Sai VPM, Rajendiran S. 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 Metab. 2018;22:651-655.
12. Modi L, Sun W, Shafizadeh N, Negron R, Yee-Chang M, Zhou F, et al. 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. 2020;128:470-481.
13. Singaporewalla RM, Hwee J, Lang TU, Desai V. Clinico-pathological Correlation of Thyroid Nodule Ultrasound and Cytology Using the TIRADS and Bethesda Classifications. World J Surg. 2017;41:1807-1811.
14. BDSS Corp. Released 2020. coGuide Statistics software, Version 1.0, India: BDSS corp. Available from: https://www.coguide.in. [Last accessed on 2021 Dec 20].
15. Haugen BR, Alexander EK, Bible KC, Doherty GM, Mandel SJ, Nikiforov YE, et 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. 2016;26:1-133.
16. Farrá JC, Picado O, Liu S, Ouyang W, Teo R, Franco AM, et al. Clinically significant cancer rates in incidentally discovered thyroid nodules by routine imaging. J Surg Res. 2017;219:341-346.
17. Russ G, Bonnema SJ, Erdogan MF, Durante C, Ngu R, Leenhardt L. European Thyroid Association Guidelines for Ultrasound Malignancy Risk Stratification of Thyroid Nodules in Adults: The EU-TIRADS. Eur Thyroid J. 2017;6:225-237.
18. Li W, Wang Y, Wen J, Zhang L, Sun Y. Diagnostic Performance of American College of Radiology TI-RADS: A Systematic Review and Meta-Analysis. AJR Am J Roentgenol. 2021;216:38-47.
19. Mohamed AE, Ahmed EE, Soliman MA, Abdullatif NA. Correlation between thyroid imaging reporting and data system with histopathology in classification of thyroid nodules. Sci J Al-Azhar Med Fac Girls 2020;4:11-6

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 25-01-2022; **Accepted:** 07-02-2022; **Published online**: 30-03-2022