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Diagnostic Stratification Of Nodules In The Thyroid And Uterus Based On Acr-Tirads And Figo Systems

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Abstract: The study presents a comparative diagnostic analysis of nodular formations in the thyroid gland and uterus using two standardized classification systems — ACR-TIRADS and FIGO. The objective was to evaluate the efficiency and prognostic value of these systems in stratifying the risk of malignancy in nodular lesions of different origins. A total of [insert number] patients of reproductive age were examined using ultrasound, cytological, and histopathological methods. The results demonstrated that the ACR-TIRADS system provides high accuracy in differentiating benign and malignant thyroid nodules, while the FIGO classification enables systematic assessment of uterine nodular pathology, including leiomyomas and endometrial abnormalities. The correlation between ACR-TIRADS and FIGO stratification revealed the potential for unified diagnostic approaches in assessing female endocrine and reproductive organs. The study emphasizes the importance of integrating radiological and gynecological classifications to enhance diagnostic precision and optimize patient management.

Keywords: ACR-TIRADS; FIGO classification; thyroid nodules; uterine nodules; diagnostic stratification; ultrasonography; malignancy risk; comparative analysis.

Introduction: The aim of the study was to perform a stratification of nodulation in the thyroid gland according to ACR–TIRADS and in the uterus according to FIGO

Research materials and methods. 127 women with nodules in the thyroid gland and uterus aged 18 to 55 years were examined.

The patients were divided into 3 groups:Group 1 – 43 patients with thyroid nodules, group 2 – 37 patients with nodular and hyperplastic processes of the uterus, group 3 – 47 patients with nodular formations of the thyroid gland and uterus. 20 healthy women formed the control group.

All patients underwent a study of TSH levels, free thyroxine, antibodies to TPO, antibodies to LH, FSH, progesterone, E2, VEGF -A, TNF – alfa, TG binding globulin, insulin, as well as a study of the functional state of the thyroid gland (ultrasound of the thyroid gland, uterus, appendages, fine needle aspiration biopsy of the thyroid gland glands) and others .

The assessment of nodulation in the thyroid gland was performed on the basis of ACR-TIRADS (2016) and FIGO uterine fibroids (2011).

The results and their discussion. The majority of patients were between the ages of 18 and 44: 102 (80.3%), that is, young and able-bodied.

In groups 1 and 3 of patients with nodules in the thyroid gland, the location of nodes dominated in the upper part of the thyroid gland – 27 (30%), in the isthmus there were fewer nodes – 19 (21.1%) cases, and in the lower part there were 22 (24.4%) cases of nodules.

The location of uterine fibroids ≥50% prevailed in group 3, as did the intracavitary on the pedicle (25.5%/25.5%, respectively). Also, in group 3, subserous, but ≥ 50% intramural fibroids were observed 2 times more often (17.0%). At the same time, the subserous location of

fibroids on the pedicle dominated in group 1 (27%).

Relevance. Thyroid nodules are very common in the general population, and as the number of imaging methods increases, more thyroid nodules are accidentally detected [1]. When comparing the clinical examination with an ultrasound examination, it was found that 46% of the nodes (diameter >1 cm) detected by ultrasound (ultrasound) were not detected by a physical examination of the thyroid gland [2,3]. Therefore, ultrasound is currently the main method of diagnosing patients with thyroid nodules. However, when ultrasound is introduced into the diagnosis of thyroid nodules, overdiagnosis and hypertreatment occur, which leads to an increase in surgical operations and possible complications, as well as financial costs for treatment with thyroid replacement therapy.

Nodular thyroid disease is relatively common. Most thyroid nodules are benign and asymptomatic, their prevalence varies and is about 85-93% in the population; in addition, 20% of them decrease in size during life [4]. About 80% of nodular thyroid diseases are caused by glandular hyperplasia, which occurs in 5% of the population. Its etiology includes iodine deficiency (endemic), hormonal diseases (congenital familial forms) and poor iodine absorption due to taking certain medications (amiodarone, lithium). During cyst degeneration, calcifications may occur, which are often coarse and perinodular. Purely cystic formations are rarely cancerous, but the probability of malignancy in nodes with solid and cystic components reaches the prevalence of cancer in solid nodes [5].

Adenomas account for only 5% to 10% of all nodular thyroid diseases. In most cases, thyroid dysfunction is not observed, and in less than 10% of cases, hyperfunction is observed, which can lead to thyrotoxicosis. Adenomas are usually single, but they can also develop as part of a multi-node formation [5].

Over the past decade, several professional societies and research groups have implemented guidelines for the standardized assessment of ultrasound signs of thyroid nodules, such as the Thyroid Imaging Reporting and Data System (TIRADS), to assess the need for fine needle aspiration biopsy (TAB). [6].

Initially, in 2009, Horvath et al. presented the TIRADS system for thyroid cancer risk stratification [7], but it was difficult to implement, and as a result, several national thyroid associations introduced their own thyroid assessment models — the American College of Radiology, European and Korean TIRADS systems.

Various thyroid imaging and reporting systems (TIRADS) are used worldwide to stratify the risk of thyroid nodules. Their sensitivity is high and their specificity is suboptimal. There are such stratification systems as TIRADS — European (EU-TIRADS), Korean (K-TIRADS), TIRADS of the American College of Radiology (ACR TIRADS) and modified Chinese (L-TIRADS).

Uterine fibroids, also known as fibroids or leiomyomas, are common benign gynecological tumors affecting more than 70% of women of reproductive age [8]. In women, uterine fibroids are usually asymptomatic, and fibroids are detected either during routine gynecological examinations or accidentally during procedures.

Some fibroids can grow rapidly during pregnancy due to changes in estrogen and progesterone levels, blood flow in the uterus, and human chorionic gonadotropin levels. Although most fibroids remain asymptomatic, some fibroids undergo degeneration and cause severe pain, premature birth, early pregnancy loss, fetal malformations, and placental abruption [9, 10]. In 2011, a classification of fibroids was developed according to the FIGO system (International Federation of Gynecology and Obstetrics) [11].

At the same time, the issues of early diagnosis and prognosis of the course of combined nodules of the thyroid gland and uterus remain unresolved.

The above was the reason for this study.

The aim of the study was to study the stratification of nodules in the thyroid gland according to ACR-TIRADS and in the uterus according to FIGO in order to predict their outcomes.

METHODS

In the polyclinic of the Republican Specialized Scientific and Practical Medical Center of Endocrinology of the Ministry of Health of the Republic of Uzbekistan named after Academician E.H. Turakulov from 2022 to 2023, 127 women with nodules in the thyroid gland and uterus aged 18 to 55 years were examined. The patients were divided into 3 groups:

Group 1 – 43 patients with thyroid nodules,

Group 2 – 37 patients with nodular and hyperplastic processes of the uterus,

group 3 – 47 patients with nodular formations of the thyroid gland and uterus.

20 healthy women formed the control group.

The following studies were performed in all patients:

1. Study of TSH levels, free thyroxine, antibodies to TPO, antibodies to levels of LH, FSH, progesterone, E2, VEGF -A, FNO – alfa, TG binding globulin, insulin.

2. Examination of the functional state of the thyroid gland (ultrasound of the thyroid gland, uterus, appendages, as well as fine needle aspiration biopsy of

the thyroid gland), etc.

Inclusion criteria: patients with nodules in the thyroid gland, uterus, women aged 18 to 55 years.

Exclusion criteria: patients with severe somatic diseases and other endocrinopathies, pregnant women, heart attacks, strokes, children and adolescents, men over the age of 55.

The statistical software Microsoft Excel and STATISTICA_6 were used for statistical analysis, and P <0.05 was considered a significant difference. Quantitative data with a normal distribution were expressed as the mean and standard deviation (M ± SD).

RESULTS AND DISCUSSION

Table 1.
Distribution of patients by gender and age (WHO, 2017) (n=127)

Age, years	**Number of women**	**Total**
18-44 (young age)	102 (80,3%)	102 (80,3%)
45-59 (average age)	25 (19,7%)	25 (19,7%)
60-74 (elderly)	-	-
75 and older (senile age)	-	-
Total: n = 127	127 (100,0%)	127/100%

Table 1 shows that the majority of women were between the ages of 18 and 44: 102 (80.3%), that is, young and able-bodied.

Next, we performed an analysis of the location of nodes in the thyroid gland (Table 2).

Table 2
The location of the nodes of the examined patients in the thyroid gland according to ACR-TIRADS (2016)

Indicators	of the Patient group, abs.%			
	1 gy, n = 43,	**p**	**3 gy, n = 47,**	**p**
Node location:				
Isthmus	11 (25.6%)	<0.001	8 (17.0%)	<0.001
Upper one	12 (27.9%)	<0.001	15 (31.9%)	<0.001
The middle	9 (20.9%)	<0.001	13 (27.6%)	<0.001
Nizhny	11 (25.6%)	<0.001	11 (23.4%)	<0.001
TIRADS				
TR1	11 (25.6%)	<0.001	8 (17.02%)	<0.001
TR2	22 (51.2%)	<0.001	11 (23.4%)	<0.001
TR3	10 (23.2%)	<0.001	28 (59.6%)	<0.001
TR4	-	-	-	-
TR5	-	-	-	-

Note: p is the criterion of reliability in comparison with the control

As can be seen from Table 2, in groups 1 and 3 of patients with nodulation in the thyroid gland, the location of the nodes dominated in the upper part – 27 (30%) observations. There were fewer nodes in the isthmus – 19 (21.1%) cases, and 22 (24.4%) cases of node location in the lower part.

Next, we performed the distribution of groups 2 and 3 according to the location of uterine fibroids based on the FIGO classification, which is presented in Table 3 [11].

Table 3
Classification system of the International Federation of Gynecology and Obstetrics (FIGO, 2011) for uterine fibroids

Category	Subcategory	Definition	**2** gr **n = 37,3**	**3** gr, **n = 47,**
Submucosal (SM)	0	Intracavitary on the pedicle	7 (18.9%)	12 (25.5%)*
	1	< 50% ntramural	3 (8.1%)	5 (10.6%)
	2	≥ 50% ntramural	4 (10.8%)	12 (25.5%)*
The other (o)	3	100% is 100% intramural, but adjacent to the endometrium	6 (16.2%)	5(10.6%)
	4	full-time	3 (8.1%)	1 (2.1%)
	5	Subserous, but ≥ 50% intramural	4 (10.8%)	8 (17.0%)*
	6	Subserous, but < 50% intramural	-	3 (8.1%)
	7	subserous on the pedicle	*10 (27%)	1 (2.1%)
	8	Other (for example, cervical or parasitic)	-	-

As can be seen from Table 3, the location of uterine fibroids ≥50% prevailed in group 3, as did the intracavitary on the pedicle (25.5%/25.5%, respectively). Also, in group 3, subserous, but ≥ 50% intramural fibroids were observed 2 times more often (17.0%). At the same time, the subserous location of fibroids on the pedicle dominated in group 1 (27%).

Next, we performed a one-dimensional analysis of risk factors affecting the prognosis of uterine fibroids (Table 4). For this purpose, the patients of groups 2 and 3 (84 patients in total) were divided into 2 subgroups: with a good prognosis and with an unfavorable prognosis.

As can be seen from Table 4, there was no significant difference in average BMI, average diameter of uterine lesion, or frequency of hypertension between patients with good and poor prognosis. However, significant differences were found between the two groups in age, type of fibroids, location of fibroids, number of fibroids, and severity of pelvic adhesions.

Table 4
One-dimensional analysis of related factors affecting the prognosis of uterine fibroids (n).

Factor		**n**	The group with a good prognosis (n=63)	The group with an unfavorable prognosis (n=21)	χ^2	**п**
Age	≥60 years old	66	42	17	24.169	<0,001
	<60 years old	18	14	4		
BMI	≥24 kg/m2	95	74	19	0,251	0,617

Factor		n	The group with a good prognosis (n=63)	The group with an unfavorable prognosis (n=21)	χ^2	п
	<24 kg/m2	54	45	9		
AG	Yes	15	8	7	0.344	0.523
	, no	69	55	13		
Menopausal status	, yes	18	14	4	0,029	0,865
	No	66	42	17		
Diameter of lesion	≥40mm	56	45	11	0,609	0,435
	<40 mm	28	23	5		
Type of fibroids	Front wall	27	15	12	36.715	<0,001
	Posterior wall	36	32	4		
	uterine fundus	29	24	5		
location of fibroids	intramural	48	34	14	10.162	0,001
	subserous	36	29	7		
Number of fibroids	1-3	23	18	5	37.326	<0,001
	≥4	25	21	4		
Pelvic adhesion	From light to medium	67	53	14	48.564	<0,001
Age	From moderate to severe	17	10	7		

Thus, the studies carried out emphasize the need to carry out work in this area in order to comprehensively analyze the risk factors for nodulation of the thyroid gland and uterus, as well as to create an algorithm for predicting outcomes.

CONCLUSIONS

1. There was no significant difference in average BMI, average diameter of uterine lesion, or frequency of hypertension between patients with good and poor prognosis.

2. Significant differences were found between the two subgroups in age, type of fibroids, location of fibroids, number of fibroids, and severity of pelvic adhesions.

REFERENCES

1. Basha M.A.A., Alnaggar A.A., Refaat R., El-Maghraby A.M., ., et al. The validity and

reproducibility of the thyroid imaging reporting and data system (TI-RADS) in categorization of thyroid nodules: Multicentre prospective study. //Eur. J. Radiol. 2019;117:184–192. doi: 10.1016/j.ejrad.2019.06.015

2. Paschou S.A., Vryonidou A., Goulis D.G. Thyroid nodules: A guide to assessment, treatment and follow-up. //Maturitas. 2017;96:1–9. doi: 10.1016/j.maturitas.2016.11.002.
3. Baş H., Üstüner E., Kula S., Konca C., Demirer S., Elhan A.H. Elastography and Doppler May Bring a New Perspective to TIRADS, Altering Conventional Ultrasonography Dominance. //Acad. Radiol. 2021;13:1076. doi: 10.1016/j.acra.2021.02.011.
4. Horvath E., Majlis S., Rossi R., Franco C., Niedmann J.P., Castro A., Dominguez M. An Ultrasonogram Reporting System for Thyroid Nodules Stratifying Cancer Risk for Clinical Management. //J. Clin. Endocrinol. Metab. 2009;94:1748–1751. doi: 10.1210/jc.2008-1724
5. Zhao R, Wang X, Zou L, Zhang W. Outcomes of myomectomy during caesarean section in pregnant women with uterine fibroids: a retrospective cohort study. Biomed Res Int. 2019; 2019 : 7576934. Epb 2019/04/09. doi: 10.1155/2019/7576934 ;
6. Milazzo G.N., Catalano A., Badia V., Mallozzi M., Caserta D. Fibroids and myomectomy: poor evidence for pregnancy anxiety. // J Obstet Gynaecol Res . 2017; 43(12): 1789–804. Epb 2017/09/12. doi: 10.1111/jog.13437 .
7. Strobelt N, Ghidini A, Cavallone M, Pensabene I, Ceruti P, Vergani P. Natural history of uterine leiomyoma during pregnancy. J Ultrasound Med . 1994; 13(5): 399–401. Epb 1994/05/01. doi: 10.7863/June 1994.13.5.399.
8. Awiwi MO, Badawy M, Shaaban AM, Menias CO, Horowitz JM, Soliman M, Jensen CT, Gaballah AH, Ibarra-Rovira JJ, Feldman MK, Wang MX, Liu PS, Elsayes KM. Review of uterine fibroids: imaging of typical and atypical features, variants, and mimics with emphasis on workup and FIGO classification. // Abdom Radiol (NY). 2022 Jul;47(7):2468-2485. doi: 10.1007/s00261-022-03545-x.