BRITISH MEDICAL JOURNAL

British Medical Journal
Volume 2, No 1., 2022
Internet address: http://ejournals.id/index.php/bmj
E-mail: info@ejournals.id
Published by British Medical Journal
Issued Bimonthly
3 knoll drive. London. N14 5LU United Kingdom
+44 7542 987055
Chief Editor
Dr. Fiona Egea

Requirements for the authors.
The manuscript authors must provide reliable results of the work done, as well as an objective judgment on the significance of the study. The data underlying the work should be presented accurately, without errors. The work should contain enough details and bibliographic references for possible reproduction. False or knowingly erroneous statements are perceived as unethical behavior and unacceptable.
Authors should make sure that the original work is submitted and, if other authors' works or claims are used, provide appropriate bibliographic references or citations. Plagiarism can exist in many forms - from representing someone else's work as copyright to copying or paraphrasing significant parts of another's work without attribution, as well as claiming one's rights to the results of another's research. Plagiarism in all forms constitutes unethical acts and is unacceptable. Responsibility for plagiarism is entirely on the shoulders of the authors.
Significant errors in published works. If the author detects significant errors or inaccuracies in the publication, the author must inform the editor of the journal or the publisher about this and interact with them in order to remove the publication as soon as possible or correct errors. If the editor or publisher has received information from a third party that the publication contains significant errors, the author must withdraw the work or correct the errors as soon as possible.

British Medical Journal Volume-2, No 1
10.5281/zenodo.5895203

STUDY OF THE DEPENDENCE OF CHANGES IN THE THYROID AND MAMMARY GLAND ON THE BASIS OF TI-RADS AND BI-RADS - SYSTEMS.

Saidiganikhodja Ibragimovich Ismailov Department of Endocrinology and Pediatric Endocrinology of the Tashkent Pediatric Medical Institute. Tashkent, Uzbekistan ismailov.said@list.ru https://orcid.org/0000-0001-9930-6410

Otabek Sabirovich Yuldashev basic doctoral student of the Tashkent Medical Academy. Tashkent, Uzbekistan otabek.sabirovich1989@mail.ru

https://orcid.org/0000-0002-5503-9661

Background: Mastopathy, a benign breast disease, and the most common diagnosis in mammology, affecting more than one million women in the United States each year [1]. Mastopathy in Uzbekistan averages 1,590.3 cases per 100,000 women[2]. The purpose of the study: to study the relationship between changes in the thyroid gland and mammary gland in women of childbearing age with mastopathy and thyroid pathology.

Methods: The study followed the approval of the Ethics Committee for Helsinki Experimental, Clinical and Pharmaceutical Research, and the Protocol for the Study of International Agreements. For the study 184 women of childbearing age (18-49) have been chozen who were observed with mastopathy and thyroid pathology on the basis of the Urgench branch of the Tashkent Medical Academy in 2018-2021. Changes in the mammary and thyroid glands in patients were assessed on the sonography according to the BI-RADS and TI-RADS-systems. These patients were followed dynamically for 3 years.

Results: In 52 patients with BIRADS 1 breast changes, the majority of thyroid sonography findings (50%) included TIRADS 1, 11 (21,15%) had TIRADS 2, and 9 (17,3%) in TIRADS 3 category, in 6 (11,55%) TIRADS 4 category and 71 patients with BIRADS 2 changes in the mammary gland, 19 (26,7%) had thyroid changes in TIRADS 1, 23 (32,4%) had TIRADS 2 changes, and 19 (26,7%) had thyroid changes in TIRADS category 3, in 8 (14.2%) changes in TIRADS 4. In 37 patients with BIRADS 3 in the mammary gland, TIRADS 1 changes in thyroid USE 2 (5,4%), TIRADS 2 changes in 3 (8,1%), 19 (51,4) %) in TIRADS 3, 12 (32,4%) in TIRADS 4, and the only TI-RADS 5 in the study. The study found no changes in TIRADS 1 in the thyroid gland findings of patients with very few detected BIRADS 4. Of the 6 patients in this category, 1 had TIRADS 2 changes, 2 had TIRADS 3 changes, and 3 had TIRADS 4 changes. Breast USE conclusion In a single patient with BIRADS 5, changes specific to TIRADS 3 were detected in USE of thyroid glands.

Conclusion: It can be concluded that as the TIRADS category in the thyroid gland increased, changes in the BI-RADS system were increased as well in the ultrasound examination (USE) of the mammary gland.

Keywords: goiter, mastopathy, fertile age, ultrasound examination

The urgency of the problem. Mastopathy, a benign breast disease, and the most common diagnosis in mammology, affecting more than one million women in the United States each year [1]. Mastopathy in Uzbekistan averages 1,590.3 cases per

100,000 women[2]. However, the etiology of mastopathy is unknown [3], but the link between thyroid pathology and mastopathy [4] and the link between thyroid pathology and breast cancer [5] have been confirmed in many studies. The urgency of the problem of breast dysgormonal diseases and thyroid dysfunction lies in its prevalence. Mastopathy is the most common disease in women, accounting for 90% of diseases in mammology [6]. Unlike Breast cancer, FCM (Fibrosis cystic mastopathy) occurs in the reproductive age, and breast cancer occurs mainly in the postmenopausal period FCM is most common in women aged 30–40 years [7]. According to the College of American Pathologists, proliferative FCM without atypia increases the risk of breast cancer by 1.5–2 times, and proliferative FCM without atypia by 4–5 times [7]. The etiology of FCM has not been fully elucidated, and risk factors include endocrine disorders, mainly changes in thyroid hormones [8].

Often, nodular tumors of the mammary gland (MG) and nodular thyroid gland (TG) are detected together, that is why their etiological basis may be a single endocrine disorder. The majority of MG nodules are non-dangerous in their etiopathogenesis proliferative, colloidal changes (local fibrosis - 45%, cysts - 22%, fibroadenoma - 17%, lipoma - 10%, papilloma, intrammar lymph nodes), only 1-5% of these are highly differentiated carcinomas and highly differentiated cancers arising from the epithelium [9]. Because ultrasound examination (USE) and mammography and other light diagnostic methods have their own advantages and disadvantages and today's effective, accurate way of diagnosing mammary gland disease is a complex approach [10].

The BI-RADS classification is the standard for interpreting the results of light and cytological examination, facilitates mutual understanding of physicians in different countries , helps to choose treatment tactics, provide quality medical care and determine the likelihood of possible complications and optimize patient management [11,12].

In our study, patients were initially categorized according to the results of the BI-RADS system. Subsequently, the status of thyroid disease and TI-RADS classification in USA was studied in patients belonging to each category. 1 table and 1 picture.

Table №1

Changes in the mammary gland in various thyroid pathologies categories by BI-RADS system.

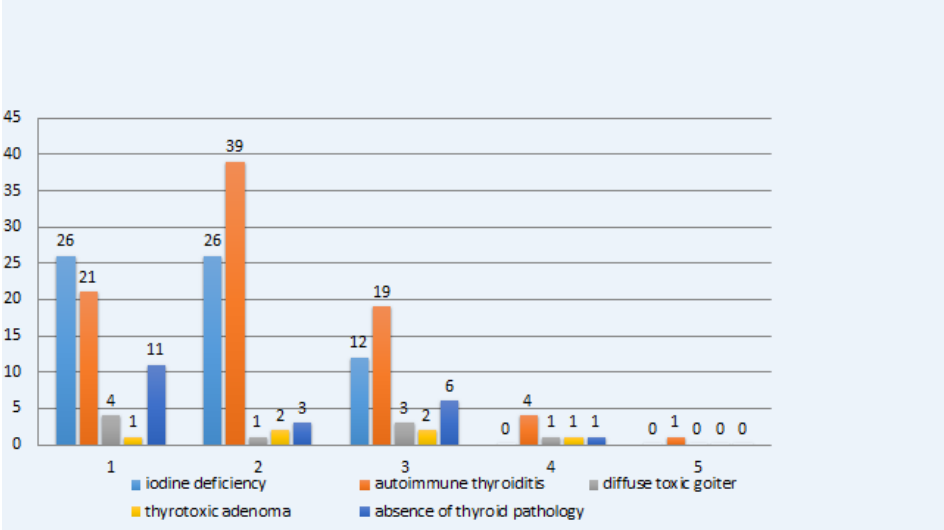
BIRADS category	Thyroid pathology				*without pathology in 21 cases (11,6%)*
	(IDIG) In 64 cases (34,7%)	*AIT In 84 cases (45,6%)*	*Thyrotoxic goiter 9 cases (4,9%)*	*Thyrotoxic adenoma in 6 cases (3,2%)*	
0	0	0	0	0	0
1	26	21	4	1	11
2	26	39	1	2	6
3	12	19	3	2	4
4	0	4	1	1	0

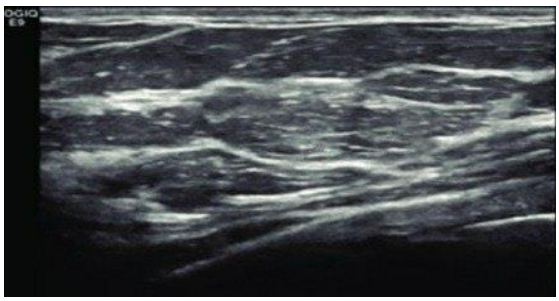
5	0	1	0	0	0
6	0	0	0	0	0

BI-RADS - 0 (inaccuracy or lack of quality of examination) - requires re-inspection or other light diagnostic methods. This category applicable if: large wounds, burns in the mammary gland Ultrasound examination (USE) is not possible, postmenopausal women are partially or completely covered by adipose tissue on ultrasound, large mammary glands and giant breasts are not fully visible on the sensor surface, and if it is not possible to see it in mammography . In this case, the sensitivity or specificity of the test is better checked in another way. The sensitivity of ultrasound in detection of cancer is significantly reduced, and it is not possible to completely rule out cancer according to ultrasound examination. Additional X-rays - mammography (MG) should be recommended, because the absence of focal pathology does not completely rule out the presence of breast cancer. No changes in this group were detected in any of the patients in our study.

1 picture. Categories of breast changes in various thyroid pathologies according to the BI-RADS system.

*BI-RADS 1 – **(positive) focal changes are not detected, there are no signs of a***





dangerous process. Category 1 usually includes normal changes in the structure of the mammary glands in accordance with the patient's age, physiological condition and constitution, as well as the necessary examinations for the same age. In our study, 64 cases (34.7%) of this category were observed. Of these, 26 (14.1%) were due to iodine deficiency, 21 (11.4%) were due to autoimmune thyroiditis, 4 (14.1%) were due to diffuse toxic goiter and 1 was due to thyrotoxic adenoma. 11 of these changes

were found to occur in the absence of thyroid pathology.

2 **picture. The patient was 45 years old, both breast fibrosis tissue thickening was detected in BI-RADS 1**

BI-RADS 2 - good quality changes simple cysts, lipomas, intramammary lymph nodes, mammary gland parenchyma after uncomplicated endoprosthesis practice, typical fibroadenomas not enlarged in dynamics, post-traumatic scarring. In our study, 71 cases (38.5%) were observed. Of these, 26 (14.1%) were due to iodine deficiency, 39 (21.1%) were due to autoimmune thyroiditis, 1 was due to diffuse toxic goiter and 2 were due to thyrotoxic adenoma, and 6 were due to thyroid. found to occur in the absence of pathology.

Figure 3. Lymph node-like nodular product BI-RADS 2

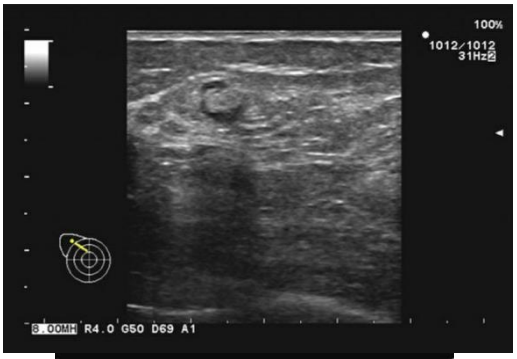


Figure 4. The mammography of the same patient is pea-shaped, the borders are clear, straight, light in the center, the lymph node.

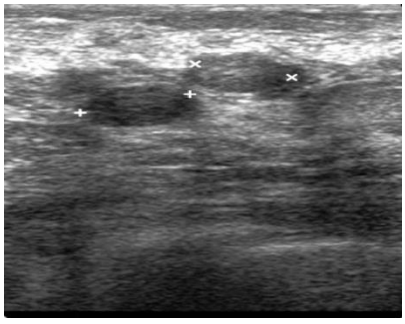


Figure 5 Fibroadenoma BI-RADS 2.

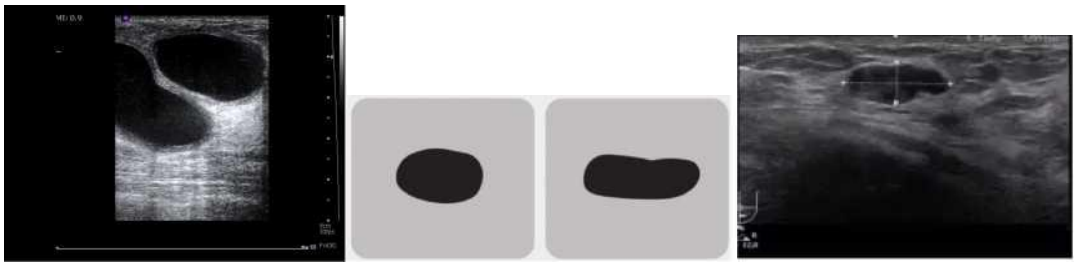


Figure 6. Patient M., 32 years. USE conclusion: Right breast fibroadenoma. Schematic representation of BI-RADS 2.

BI-RADS - 3 - Suspicious, safe products requiring repeated examinations after a certain time, with a probability of cancer ~ 0.3-2%. In particular, this group includes fibroadenomas that have not been newly detected or previously examined, small atypical and complex cysts, cysts with signs of inflammation, hypo exogenic tumors of the adenosis type around which the vascular image is not enhanced. These cultures require dynamic monitoring within 3–6 months and in the background of treatment.

If positive changes in the dynamics are observed - 2 categories, if negative changes are observed - 4 categories. In our study, 42 cases (22.8%) of this category were observed. Of these, 12 (6.5%) were due to iodine deficiency, 19 (10.3%) were due to autoimmune thyroiditis, 3 were due to diffuse toxic goiter and 2 were due to thyrotoxic adenoma, and 4 were due to thyroid. found to occur in the absence of pathology.

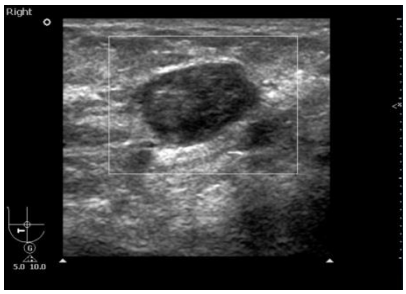


Figure 7. BI-RADS 3. USE: a newly diagnosed fibroadenoma observed after patient`s complains of unpleasant sensations in the breast area for 3 months at the age of 30 years

BI-RADS - 4 - (suspected malignant tumor, changes requiring biopsy). Changes with a 2% to 95% chance of developing cancer and requiring unconditional morphological examination are included, and this category is further divided into 3 categories depending on the increased risk of malignancy and the need for a biopsy: 4A - low (minimum); 4B - medium (slow) and 4C - high.

In our study, 7 cases (3.8%) of this category were observed. No iodine deficiency was observed in this group. Of these, 3 were observed in patients with AIT, 1 in patients with DTG, and 1 in patients with thyrotoxic adenoma.

BI-RADS - 5 - very high probability of malignancy (more than 95%) - characteristic signs of cancer (vertical spread, indistinct, uneven, star-shaped (light) contour, hyperechoic zone of desquamation, wide acoustic shadow behind the product, requiring appropriate measures).

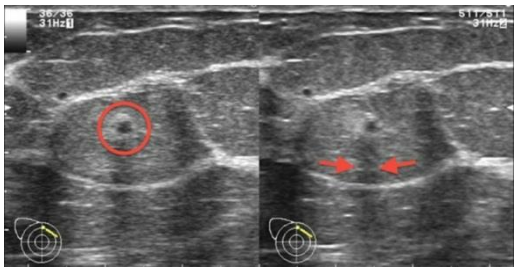


Fig. 8 The 46-year-old patient had no identified nodules, complaints, and previous USE.

BI-RADS 5. In our study, 1 (1%) case of this category was observed, as a result of which he underwent unilateral mastectomy and lymphadenectomy and received chemotherapy 5 times. This condition has been observed for many years in a patient with a hypertrophic form of AIT, subclinical hypothyroidism, who has not received replacement therapy, after which the patient was prescribed levothyroxine natrium 1.5 mcg / day.

BI-RADS-6 is a malignant tumor that is histologically confirmed, requiring immediate action, and includes cancer-specific changes.

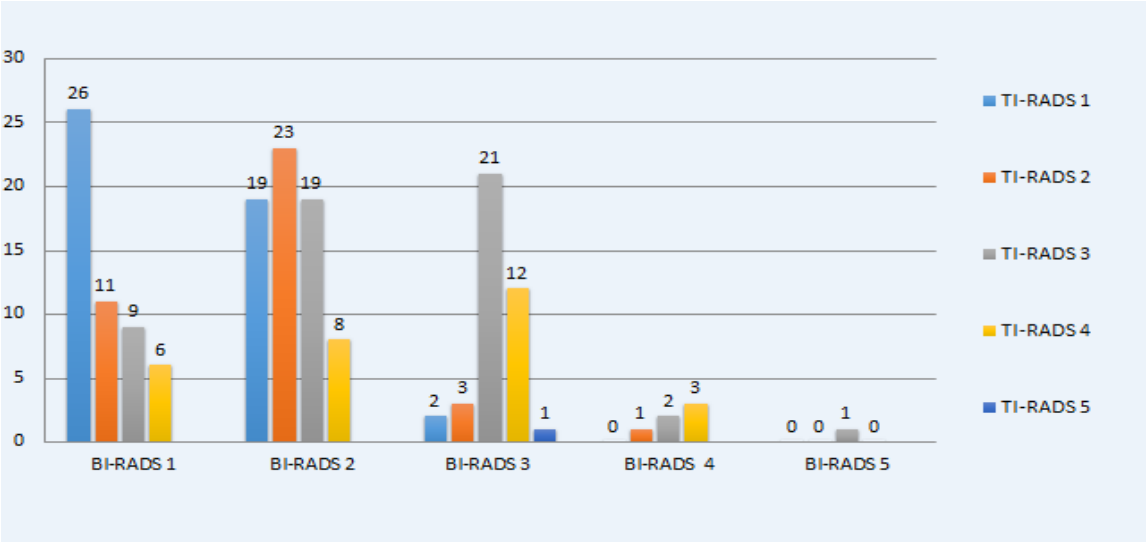
None of the patients in the study found symptoms specific to this category. In the next phase of our study, patients were divided into groups according to the TIRADS and BI-RADS system (Table 2 and Figure 2) based on the USE findings, and the relationship between them was studied.

Table 2

Changes in the thyroid gland and mammary gland interdependence.

BIRADS category	TIRADS category					without pathology in 21 cases (11,6%)
	1	2	3	4	5	
	in 47 cases (25,5%)	in 37 cases (20,1%)	in 52 cases (28,3%)	in 29 cases (15,7%)	in 1 cases (0,54%)	
1	26	11	9	6	0	11
2	19	23	21	8	0	6
3	2	3	19	12	1	4
4	0	1	2	3	0	0
5	0	0	1	0	0	0
6	0	0	0	0	0	0

In 52 patients with BIRADS type 1 breast changes, the majority of thyroid USE



findings (50%) included TIRADS 1, 11 (21,15%) had TIRADS 2, and 9 (17,3%) in TIRADS 3, in 6 (11.55%) TIRADS 4, were detected. 71 patients with BIRADS 2 changes in the mammary gland, 19 (26.7%) had thyroid changes in TIRADS 1, 23 (32.4%) had TIRADS 2 changes, and 19 (26.7%) had thyroid changes.) in TIRADS 3, in 8 (14.2%) changes in TIRADS 4.

Figure 9. Interdependence of changes in the thyroid gland and mammary gland.

In 37 patients with BIRADS 3 changes in the mammary gland, TIRADS 1 changes in thyroid USE 2 (5.4%), TIRADS 2 changes in 3 (8.1%), 19 (51.4) %) in TIRADS 3, 12 (32.4%) in TIRADS 4, and the only TI-RADS 5 change in the study.

The study found no changes in TIRADS 1 in the thyroid gland findings of patients with very few detected BIRADS 4 changes. Of the 6 patients in this category, 1 had TIRADS 2 changes, 2 had TIRADS 3 changes, and 3 had TIRADS 4 changes.

Ultrasound examination of breast concludes that, in a single patient with type BIRADS 5, changes specific to TIRADS 3 were detected in USE of thyroid glands.

A biopsy was recommended in patients in groups TIRADS 3-5.

Biopsy materials were examined according to the international cytological classification (Bethesda Thyroid Classification, 2017).

In all patients with TIRADS 3 detected by ultrasound, Bethesda was dynamically observed with good quality changes (adenamatosis node, colloid node, lymphocytic thyroiditis) specific to category B 2 according to Thyroid Classification. In the dynamic follow-up, it was recommended to continue drug treatment, as there were positive changes in the size of the node and clinical signs in the background of treatment.

Ultrasound examination focused on the node size of patients diagnosed with TIRADS 4. Patients smaller than 1.0 cm in nodule size were observed. In 8 out of 10 patients with nodule size greater than 1.5 cm, good quality changes specific to category B 2 were identified and dynamically monitored. An indeterminate follicular change specific to category V 3 was detected in 2 patients and a hemithyroidectomy was performed.

In a single patient with a change in TIRADS category 5, a totalthyroidectomy was performed when the biopsy result showed category B4. The postoperative outcome was a conclusion of follicular neoplasia. The patient was followed up in the background of substitution therapy.

DISCUSSION: to date, there is a lot of information about the interaction of mammary glands with thyroid dysfunction [13], but most of them are related to the problem of breast cancer (BC) [14]. In most studies, thyroid pathology has been found to be a risk factor for benign breast disease (BBD) and BC, while in some observations the link between benign breast disease (as well as BC) and thyroid pathology has been uncertain [15,16].

The combined clinical course of mastopathy and thyroid pathology, the effect of thyroid pathology on the course of mastopathy has been studied in many studies before us.

A number of studies have found a reliable link between proliferative breast disease and autoimmune disease of the thyroid gland, particularly hypothyroidism [210].

Ditsch and co-authors [215] studied thyroid hormones in patients with mastopathy and found a reliable link between them. The prevalence of hypothyroidism (18.5%) was found to be particularly high in patients with mastopathy.

As a result of the research of Hardefeldt and co-authors [206], the relatively high incidence of mastopathy in hypothyroidism compared to others was also confirmed in our study.

C. Anil, T. Guney, A. Gursoy In a study of benign breast disease and thyroid disease, the association between nodular goiter and autoimmune thyroiditis and benign breast hyperplasia was more common in this non-pathology control group. (31.4% and 21.1%, respectively).

Our observations also yielded positive conclusions, consistent with the data of C. Anil, T. Guney, A. Gursoy.

The main part of our study was to compare changes in the thyroid gland and mammary gland based on the TIRADS and BI-RADS systems. This research has not been done before. Based on the findings, the following was identified.

In the majority (50%) of patients diagnosed with type BIRADS 1 in the breast, TIRADS type 1-specific changes were detected. In the majority of patients diagnosed with BIRADS category 2 (32.4%), changes specific to category TIRADS 2 were observed. In the majority of patients with changes in category BIRADS 3 (51.4%), changes specific to TIRADS 3 were detected, and the proportion of TIRADS 1 and TIRADS 2 decreased.

CONCLUSION: It can be concluded that as the TIRADS category in the thyroid gland increased, changes in the BI-RADS system were increased as well in the USE of the mammary gland.

REFERENCES:

1. Figueroa JD, Pfeiffer RM, Brinton LA, Palakal MM, Degnim AC, Radisky D et al. Standardized measures of lobular involution and subsequent breast cancer risk among women with benign breast disease: a nested case-control study. Breast Cancer Research & Treatment 2016;159(1):163-172.

2. Toshmatova G. Prevalence of Mastopathy among Women of Tashkent City Journal of Oncology Research Treat 2019, 4:1.

3. Manoosh Zendehdel, Babak Niakan Subtypes of Benign Breast Disease as a Risk Factor for Breast Cancer: A Systematic Review and Meta-Analysis Protocol Iran J Med Sci. 2018 Jan; 43(1): 1–8.

4. Anil C, Guney T, Gursoy A. The prevalence of benign breast diseases in patients with nodular goiter and Hashimoto's thyroiditis. J Endocrinol Inves 2015; 38: 971-5.

5. Giustarini E, Pinchera A, Fierabracci P, Roncella M., Fustaino L. Thyroid autoimmunity in patients with malignant and benign breast diseases before surgery European Journal of Endocrinology (2006) 154. 645–649.

6. Haomin Yang, Natalie Holowko, Felix Grassmann, Mikael Eriksson, Per Hall, Kamila Czene Hyperthyroidism is associated with breast cancer risk and mammographic and genetic risk predictors BMC Med 2020 Aug 25;18(1):225.

7. Vysotskaya I.V., Letyagin V.P., Cherenkov V.G. and dr. Clinical recommendations of Rassian union of oncomammologists on prevention of breast cancer, differential diagnosis, treatment of precancerous lesions and benign diseases of the liver. Tumors of the female reproductive system 2016; 12 (3): 43-52.

8. Gopalani SV, Janitz AE, Martinez SA, Gutman P, Khan S, Campbell JE. Trends in cancer incidence among American Indians and Alaska Natives and Non-Hispanic Whites in the United States, 1999-2015. Epidemiology. 2019

9. Danino MA, El Khatib AM, Doucet O, Dao L, Efanov JI, Bou-Merhi JS, Iliescu-Nelea M. Preliminary Results Supporting the Bacterial Hypothesis in Red Breast Syndrome following Postmastectomy Acellular Dermal Matrix- and Implant-Based Reconstructions. Plast. Reconstr. Surg. 2019 Dec;144(6).

10. American College of Radiology. BI-RADS Breast imaging reporting and data system . Breast imaging atlas: mammography, breast ultrasound, breast MR-imaging. - Virginia. Reston, 2003. - 268 p.

11. Eberl MM, Phillips RL Jr., Lamberts H, Okkes I. : Characterizing breast symptoms in family practice. Ann Fam Med 2008; 6: 528–33.

12. Musina E.V., Kogan I.Yu. Possibilities of using biguanides in fibrocystic disease in women of reproductive age // Journal of Obstetrics and Women's Diseases. - 2019. - T. 68. - No. 3. - S. 35 - 40.

13. Ismailova M.KH. Application of the bi-rads classification for ultrasound diagnosis of breast diseases. Journal of research in health science. Vol. 2, No. 2, 2017, pp. 15-21.

14. Fisenko E.P. Application of the BI-RADS scale in breast ultrasound examination. Methodical recommendation. Moscow 2017.

15. Tarique M. A Prospective Study on Prevalence of Hyperprolactinemia & Hypothyroidism in Benign Breast Diseases. Int Arch BioMed Clin Res. 2019;5(1):18 – 19.

16. Angelousi A. Is there an association between thyroid function abnormalities and breast cancer? Arch. Endocrinol. Metab. vol.61 no.1 São Paulo Jan./Feb. 2017 Epub Aug 25, 2016 https://doi.org/10.1590/2359-3997000000191