



## CHARACTERISTICS OF THYROID DISEASE IN WOMAN WITH RHEUMATOID ARTHRITIS

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<b>Received:</b> 26 <sup>th</sup> May 2024 <b>Accepted:</b> 24 <sup>th</sup> June 2024	The chronic progressive course of RA poses the task of doctors to diagnose it as early as possible. However, recognition of RA at an early stage presents significant difficulties. To date, no strictly RA-specific laboratory test has been found. Only a combination of many clinical and laboratory signs can help in the diagnosis of this disease. Therefore, the search for methods to differentiate rheumatoid arthritis among a variety of inflammatory and degenerative diseases of the musculoskeletal system continues. According to modern concepts, connective tissue damage in RA is a consequence of developing immunopathological disorders. The autoimmune nature of RA is evidenced by the detection of rheumatoid factor (RF), circulating immune complexes (CIC), lymphocytes sensitized to connective tissue components, as well as a wide range of autoantibodies (AT). However, it should be noted that the pathological effect of such antibodies is not fully determined. The development and course of RA are associated with changes in the general and immunological reactivity of the body, complex enzymatic and metabolic shifts, in the regulation of which the endocrine system is of great importance. Hormones play an important role in metabolic processes, immunogenesis, cell membrane permeability, ion transport, protein synthesis, and enzyme system activity. Violations of the activity of the endocrine glands can lead to those changes in metabolism in the body that, even without receiving an explicit reflection in the clinical picture, can have an undoubted significance in the features of the clinical course of RA and determine the effectiveness of treatment.

**Keywords:** rheumatoid arthritis, autoimmune thyroiditis, hypothyroidism.

### INTRODUCTION

It is known that thyroid hormones (thyroid gland) are regulators of trophic functions of the body, metabolism, have an impact on adaptive processes. Thyroid hormones regulate the processes of development, maturation, specialization and renewal of almost all body tissues, and have a more pronounced effect on cell division than on their recovery, increase the activity of metabolic processes, stimulate lipogenesis, gluconeogenesis and glycogenolysis, etc. Thyroid hormones enhance both resorption and synthesis of bone tissue, the production of glycosaminoglycans and proteoglycans in connective tissue. Excessive concentration of thyroid hormones contributes to an increase in inflammatory reactions and discordance of metabolism. Essential importance in the emergence and pro the suppression of rheumatic diseases has endocrine disorders. Often, endocrine

restructuring that occurs during puberty, menopause, pregnancy, childbirth, and abortion serves as a background for the development of connective tissue diseases. At the same time, the change in neuroendocrine status is an integral component of the progression of rheumatic pains. Especially distinct hormonal shifts are observed on the part of the thyroid gland in rheumatoid arthritis (RA). The prevalence of thyroid pathology in general among patients with rheumatoid arthritis, according to literature data, reaches 34%, and Hashimoto's thyroiditis, according to various authors, ranges from 4 to 13.5%. In addition, the greatest exposure to RA in women of reproductive age indicates a certain role of the genital mountains monov in the pathogenesis of the disease. The effect of the thyroid condition on the course of rheumatoid arthritis is largely mediated by disorders of the immune system. At the same time, changes in the thyroid gland may be caused by the action of factors that cause rheumatoid



inflammation. It is possible that one of the causes of dysfunction Thyroid is a vascular pathology in RA, as well as the effect of medications taken.

### **THE PURPOSE OF THE WORK**

To study the thyroid status in RA patients, as well as the features of clinical manifestations of the disease depending on the violation of thyroid function.

### **MATERIAL AND METHODS**

In a one - time cross - sectional study would whether 52 women were included with reliable, according to the criteria of the American Rheumatology Association (1987), diagnosed with rheumatoid arthritis. The patients lived permanently in the Samarkand region, which belongs to the region of iodine deficiency. The criteria for inclusion in the study were the age of women under 50 and voluntary consent to participate in the study. The exclusion criteria from the study were severe somatic pathology, pregnancy, postmenopause, taking medications that affect the metabolism of thyroid hormones and disrupt their absorption. The age of women ranged from 20 to 49 years (39 [34,5; 43]), and the prescription of the disease is from 4 to 15 years (6 [3,75; 10.5]). Everyone has been diagnosed with high the highest degree of RA, which was estimated by counting index DAS28 (2006). Almost every second on systemic manifestations of RA were observed (53.18%). In 61.54% of cases, rheumatoid factor was detected. All were determined by the titer of antibodies to thyroid peroxidase (AT TPO), the content of free thyroxine (t4), thyroid-stimulating hormone (TSH) with the help of Alkor Bio reagent kits (St. Petersburg), free triiodothyronine (fT3) - DRG diagnostics (USA) solid-phase enzyme immunoassay on the Multiscan apparatus (Finland). Subclinical hypothyroidism was confirmed by a stable increase in TSH levels at normal fT4 and fT3 levels according to a two-time study with an interval of 6 months. Ultrasound of the gland was performed with a Logiq 5 pro device with a linear sensor with a frequency of 7-10 MHz. In gray The structure, contours, and echogenicity of the gland were evaluated in the scale mode. In addition, quantitative characteristics of blood flow in the lower thyroid were studied in spectral Doppler mode with measurement of peak systolic blood flow velocity (Vps), maximum final diastolic blood flow velocity (Ved) and calculation of peripheral resistance index (sometimes called resistive index (RI)). A small volume of thyroid gland was diagnosed taking into account the weight of women according to the standards, proposed V.A. Kostyuchenko and S.I. Pimanov. The

volume of the thyroid gland calculated according to the Brunn formula, exceeding 18 ml in women, was considered to be increased. When detecting nodes in the gland with a diameter of more than A fine needle puncture biopsy was performed 1 cm according to the standard procedure (Belfiore A., La Rosa G.L., 2001). The obtained data were subjected to statistical processing using the Statistica 6.0 package (Stat Soft, 2001) and the Biostatistica 4.03 program (S.A.Glantz, McGraw Hill // Trans. on Rus. language –"Practice", 1998). Quantitative values in the text and tables are given in the form of Me [25; 75] (Me is the median; 25 and 75 are the 1st and 3rd quartiles). Nonparametric methods were used for statistical evaluation of the results: the Mann–Whitney test and Spearman correlation analysis. The differences were considered statistically significant at  $p < 0.05$ .

### **RESEARCH RESULTS AND THEIR DISCUSSION**

Depending on the functional state The women were divided into two groups 11 (18%) women with RA (Group 1) were diagnosed with hypothyroidism (8 – manifest, 3 – subclinical), which differs from the general population prevalence of hypothyroidism among women of reproductive age in the region of mild iodine deficiency (2%). In two patients aged 31 and 47, hypothyroidism was diagnosed at the ages of 12 and 35, respectively, before the manifestation of RA. Moreover, in the first case, against the background of taking 75 mcg of levothyroxine, the TSH level was 16 mEd / l, and in the second case, hypothyroidism was compensated (TSH – 0.3 mEd / l) against the background of taking 100 mcg of levothyroxine; in the rest, a decrease in thyroid function was detected for the first time during our examination. The main cause of hypothyroidism in all was naturally autoimmune thyroiditis (AIT). There were no cases of hypertrophic form of AIT according to ultrasound examination. By the time of hospitalization, 2 (18.18%) patients Group 1 received methotrexate at a dose of 7.5 mg/week for at least 6 months as basic therapy. Prednisone was taken by 3 (27.27%), one of them at a dose of 5 mg / day and two at a dose of 10 mg / day. The rest of the patients did not receive basic therapy and took only non-steroidal anti-inflammatory drugs. The 2nd group included 41 women without thyroid dysfunction. The average age and duration of the disease did not significantly differ from similar indicators in group I. In three patients of the 2nd group, thyroid nodes were detected, in one of which the gland was enlarged in volume. During puncture biopsy, colloidal goiter was detected in all cases. Among group 2 patients, 13 (31.7%) patients received basic



methotrexate therapy at a dose of 7.5 mg/week for at least 6 months before admission to the clinic. Synthetic glucocorticoids (prednisone, metipred, diprospan injections) were treated for at least 6 months before hospitalization of 15 (36.58%) patients. The daily dose of prednisone ranged from 5 to 15 mg, metipred – from 4 to 8 mg. The rest of the patients took non-steroidal anti-inflammatory drugs.

In group 1, the number of patients with systemic manifestations of the world was statistically significantly higher than in the second. A detailed analysis of the main systemic manifestations of RA and its complications revealed statistically significant differences between the groups only in the incidence of myocardiodystrophy and anemia. The study showed that RA patients with hypothyroidism (group 1) had higher clinical and laboratory activity of the disease. In this group, ESR, DAS28, and the number of swollen joints were statistically significantly higher compared to women without thyroid dysfunction. It should be noted the high frequency of detection AT-TPO in both groups. There were no statistical differences in this indicator between the groups. This fact is probably due not only to the pathology of the thyroid gland, but also to the manifestation of extrathyroid pathology, that is, RA. According to V.V. Fadeev (2005), the prevalence of AT-TPO in random samples of young women and the elderly ranges from 15.8 to 16.9%, and in autoimmune pathology, including RA, this indicator is likely to increase, which was noted by us. The influence of the main RA therapy on thyroid status indicators was analyzed. Level TSH was statistically significantly less (0.9 [0.7; 1.6] honey / ml) in patients receiving synthetic glucocorticoids (duration of administration is not less than 6 months) at a dose of 5 to 15 mg in terms of prednisone than in patients who did not take them (2.3 [1.8; 3.3] honey / ml;  $p = 0,032$ ;  $T = 337$ ). There were no statistically significant changes in the level of thyroid hormones and TSH while taking methotrexate.

Noteworthy is the high frequency of detection of the so-called small thyroid volume, which was diagnosed taking into account the weight of women [4]. Of the 52 examined (weight – 66 kg [60.5; 73.5], height – 1.63m [1.57; 1.66]), a decrease in the size of the thyroid gland (4.6 ml [4.32; 5.13]) was found in 12 (23.07%): in 3 (weight – 75 kg [70; 80], height – 1.64 m [1.55; 1.65]) – from the 1st group and in 9 – from the 2nd (weight – 62 kg [60; 70], height – 1.62 m [1.58; 1.67]). Thus, the decrease in the volume of the gland in the subjects is due not only to autoimmune thyroiditis. According to the literature, a

small volume of thyroid gland occurs in 6.2% of cases under the age of 50 years according to the results of autopsy studies. There were no statistically significant differences between the groups in terms of ultrasound indicators of blood flow in the gland. The frequency of detection and the level of AT TPO in patients with a decrease in the size of the thyroid gland did not significantly differ from patients with normal thyroid volume. Similar data were obtained with respect to the functional operations of SHJ. However, when measuring the velocity pairs of meters of blood flow during ultrasound of the thyroid gland, a significant increase in the index of peripheral resistance was revealed with a decrease in the size of the organ (0,79 [0,55; 0,8]; 0,59 [0,56; 0,66];  $p = 0.028$ ;  $T = 351$ ). Considering all of the above, it can be assumed that thyroid hypoplasia is not always associated with autoimmune thyroiditis.

Chronic ischemia of the organ plays an important role in the genesis of atrophic changes of thyroid gland against the background of immunocomplex vasculitis and early atherosclerotic vascular lesions characteristic of this disease. Of course, this issue requires further study.

## CONCLUSIONS

The data obtained by us indicate a high frequency of hypothyroidism and the carriage of ATTPO at RA. A small volume of the thyroid gland in RA is observed both in patients with autoimmune thyroiditis and without it. The decrease in the size of the gland is not associated with the carrier of AT TPO and is combined with an increase in the index of peripheral resistance in its arteries, which may be due to chronic ischemia of the organ. The level of TSH in RA patients is determined not only by pathology Thyroid, but also glucocorticoid therapy. In patients RA in combination with hypothyroidism are more often observed systemic manifestations and high activity of the articular process.

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