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THE ROLE OF ZEOLITE AND MAGNETIZED WATER IN THE TREATMENT OF WOMEN OF REPRODUCTIVE AGE WITH UTERINE MYOMA

Specialization: 3215.01 – Obstetrics and gynecology

Field of science: Medicine

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ABSTRACT

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GENERAL DESCRIPTION OF THE WORK

Relevance of the topic. Uterine myoma are an extremely common diseases of the female in women of reproductive age, which account for up to 30% of all gynecological diseases[1].

Myoma is a common gynecologic disease that occurs in 20% of women aged > 30 years and in 40% of women aged > 40 years[2].

Uterine myoma, also known as leiomyomas or myomas, are benign, monoclonal tumors composed of smooth muscle cells from the uterus.The clinical manifestations of uterine myoma negatively affect the reproductive function of patients[3]. In addition, uterine myoma are a cause of infertility, which has great medical and social significance[4].

Risk factors for the development of myoma include a decrease in the number and function of receptors sensitive to estrogens and progesterone in the cells of the myometrium, a decrease in the hormone-producing function of the ovaries, inflammatory processes in the internal genital organs, and impaired hemodynamics in the

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pelvis[5]. Obesity, long-term dieting, a sedentary lifestyle and smoking are also considered risk factors[6].

Surgical treatments are common method of treatment for uterine fibroids[7].

When conducting drug treatment, the main requirements for drugs are maximum effectiveness and minimal side effects. One of the drugs that stands out for its pharmacological effectiveness is zeolite. Zeolite is a nutritious, antibacterial, biological adaptation, non-toxic, highly selective absorption substance, which expands its application in various fields of medicine[8].

Studies have shown that zeolite has an inhibitory effect on stem cells, reduces free radical levels, binds to carcinogens and removes them from the organism[9].

Zeolite has antioxidant, detoxifying, hormonal regulating, immune modulating and anti-inflammatory effects[10].

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Another relatively new approach in medicine is magnetized water. Water, passing through a magnetic field, changes its physical and chemical properties. As a result, magnetized water improves the rheological properties of blood and increases blood supply to tissues. Magnetized water improves cellular metabolism and reduces oxidative stress, which helps regulate cell proliferation. By stimulating the activity of the kidneys and liver, it accelerates the elimination of toxins, which normalizes hormonal levels[11].

Recently, the interest in magnetized water has been increased. In clinical and experimental studies, its effectiveness was proven in many chronic diseases[12].

Considering the relevance of the problem of effective and safe treatment of uterine myoma in women of reproductive age, we conducted a scientific study of the prospects for the therapeutic use of zeolites and magnetized water.

Object of research. The object of the study were 200 women with uterine myoma, who were treated at the Scientific Research Institute of Obstetrics and Gynecology in 2019-2022. The patients were divided into 4 groups: I group – surgical treatment (n=50); II group – treatment with magnetized water (n=50); III group – treatment with zeolite (n=50); IV group – hormonal treatment (n=50).

Purpose of the study

Comparative analysis of the therapeutic effectiveness of treating uterine myoma in women of reproductive age using zeolite and magnetized water and development of an optimized treatment algorithm.

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The tasks of the research:

1. Study of risk factors, frequency and structure of uterine myoma in women of reproductive age;
2. Comparative analysis of the impact of treatment measures on reducing the size of myomatous nodes in women of reproductive age with uterine myoma;
3. Comparative analysis of the effect of magnetized water and zeolite on some rheological indicators of blood in women of reproductive age with uterine myoma;
4. Comparative evaluation of the effect of magnetized water and zeolite on the level of steroid hormones and the main clinical markers of the blood in women of reproductive age with uterine myoma;
5. Comparative study of the effect of magnetized water and zeolite on life quality indicators of patients during the treatment of women with uterine myoma of reproductive age;
6. Development of an optimal algorithm for diagnosis and treatment of women of reproductive age with uterine myoma.

Research methods. The following research methods were used in the course of research:

- Clinical and anamnestic;
- General blood test;
- Coagulogram
- Hormonal examination;
-Instrumental examination methods (ultrasound, dopplerography);
- The quality of life
- Mathematical-statistical analysis methods.

The main provisions of the dissertation defended:

1. Treatment of uterine myoma in women of reproductive age with magnetized water and zeolite can be considered as effective and non-invasive method of hormonal therapy.

2. After therapy of uterine myoma with magnetized water and zeolite of the women in reproductive age, it is possible a quick and effective reduction of the volume of medium and small myomatous nodes.

3.The use of zeolite in the treatment of uterine myoma in women of reproductive age has allowed for a reduction in massive bleeding and a decrease in the intensity of pelvic pain.

4. The use of zeolite and magnetized water can be recommended as an effective method for maintaining reproductive function in women of reproductive age with uterine myoma.

5. Treatment of women of reproductive age with uterine myoma with magnetized water and zeolite has an effective influence on hormonal status similar to hormonal therapy.

6. In women of reproductive age suffering from uterine myoma, treatment with magnetized water and zeolite can allow for a faster restoration of quality of life and a positive change in mood.

Scientific novelty of the research

The conducted scientific study allowed to identify multifaceted risk factors and causes of uterine fibroids. Thus, it was possible to expand our understanding of the etiopathogenesis and risk factors, features of the clinical course and examination of uterine fibroids. As a result of the study, the effectiveness of zeolite in the treatment of uterine fibroids was determined taking into account its natural detoxifying, antioxidant and hormone-regulating properties. It was established that the effect of zeolite on the hormonal background in women of reproductive age with uterine fibroids is not inferior in effectiveness to hormonal drugs. The positive effect of magnetically activated water on metabolic disorders, cell proliferation and rheological properties of blood in the innovative device "MAGMATRIX-P" made it possible to reduce the volume of fibroid nodes in women of reproductive age. Based on the obtained results, an algorithm for treating patients with uterine fibroids is proposed.

Practical significance of research

The obtained results allow to determine the treatment tactics and the choice of the method of treatment of patients with uterine myoma. Conducting a comprehensive clinical, laboratory and instrumental examination of women with uterine myoma, studying the tactics of treatment in a comparative aspect allowed to develop an optimized algorithm of therapy of patients. Taking into account the refusal of conservative myomectomy in women with uterine myoma of reproductive age, the desire to realize the reproductive function in the future or the refusal of hormonal treatment for various objective and subjective reasons, the use of magnetized water and zeolite as an alternative method of treatment was studied.

Application of research results. The results of the work are applied in the activities of Scientific Research Institute of Obstetrics and Gynecology.

The organization in which the dissertation work was carried out. The work was performed at the Scientific Research Institute of Obstetrics and Gynecology.

Approbation of research work. The results of the research work were reported at the following scientific conferences:

-International Conference on Recent Trends in Biological Sciences, January 10, – 2023;

-Uluslararası Paris tıp ve sağlık bilimleri kongresi. Paris, 26 oktyabr, 2023

- Scientific-practical Conference dedicated to the 100th anniversary of the national leader H.Aliyev, Baku, May 25, 2023

- Uluslararası tıp ve sağlık bilimleri kongresi. Dubai, BAE 15-19 Mayıs 2025.

The results of the research work were reported and discussed on march 23, 2023 at the initial discussion at the Scientific Research Institute of Obstetrics and Gynecology (Protocol № 10), on Aprel 18,

2025 at the scientific seminar of the dissertation Council No. 2.06 ED of AMU (protocol №4).

Published works. 15 scientific works on the topic of the dissertation (8 articles, 7 theses) were published.

Volume and structure of the dissertation. The dissertation work is written in A4 format, in Azerbaijani language, using "Times New Roman", 14 fonts and 1.5 line spacing. The dissertation consists of 166 pages of computer text (196.794 marks), table of contents (4.013 marks), introduction (8.787 marks), literature review (67.717 marks), Chapter II on research materials and methods (18.123 marks), Chapter III on the results of personal research (45.027 marks), Chapter IV (15.095 marks), conclusions (33.895 marks), results (3.565 marks), practical recommendations (572 marks). The work is illustrated with 20 graphs, 47 tables and 5 pictures. The list of literature consists of 186 sources (of which 14 domestic, 177 Russian and other foreign).

RESEARCH RESULTS AND THEIR DISCUSSION

The research work was conducted on the basis of the Scientific Research Institute of Obstetrics and Gynecology during 2019-2022. 200 patients with uterine myoma of various sizes and shapes were included in the study.

Criteria for inclusion of patients in the study:

- Patient of reproductive age (18-44 years).
- Patients with confirmed uterine myoma based on the results of clinical and instrumental examination methods;

Criteria for exclusion of patients from the study:

1. The presence of adenomyosis in combination with uterine myoma;
2. Age under 18 and over 45 years;
3. Active infectious or inflammatory process in the pelvic organs in combination with uterine myoma;
4. The presence of confirmed oncological pathology of the cervix or endometrium.

It was collected anamnesis from all patients included in the study. It was performed blood tests (general, coagulogram), hormonal and instrumental studies and it was studied quality of life.

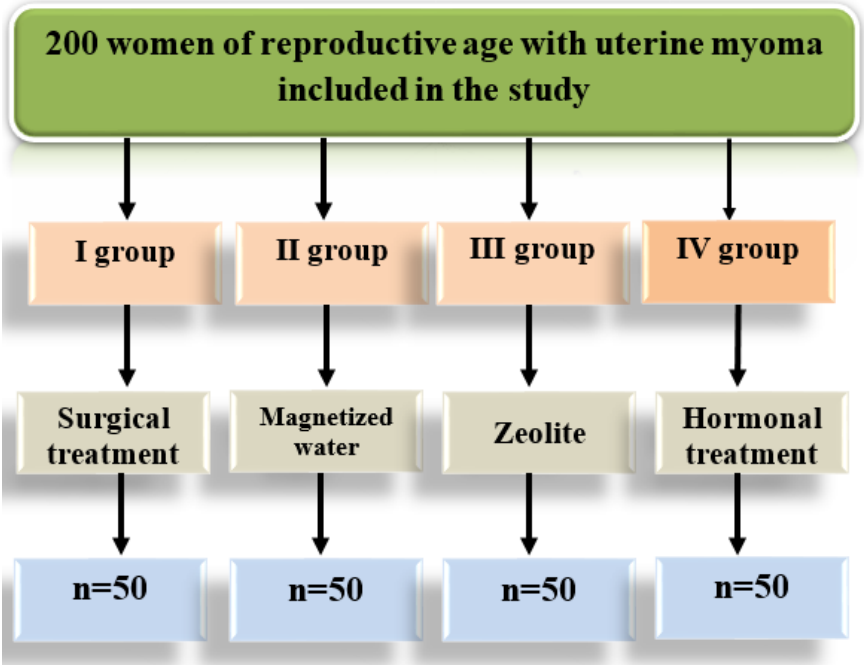


Figure 1. Research design

The concentrations of LH, FSH, estradiol, progesterone and prolactin in blood serum were determined before and after treatment. Estradiol was studied in the ovulation phase. Progesterone concentration in blood serum (plasma) was determined using the "PROGESTERON-IFA" reagent kit. LH, FSH hormones were determined in blood serum by enzyme immunoassay using a set of reagents " LH-ELISA ".

It was determined the following rheological properties of the blood of patients during the coagulogram study: D-dimer, prothrombin time, fibrinogen, international normalized ratio (INR), antithrombin

III. It was determined level of erythrocytes, leukocytes and thrombocytes during the general blood test.

Before and after treatment it was topical performed diagnostics of myomatous nodes using the ultrasound Voluson™ E8/E8 device.

It was determined the quality of life of women included in the study using the questionnaire "Symptoms of uterine myoma and quality of life" (UFS - QOL).

Patients of I group underwent surgical treatment (conservative myomectomy, hysterectomy).

Patients of II group underwent treatment with magnetized water. Magnetized water was obtained by increasing the magnetizing effect of water by 50-100 times using a special 3D magnetic matrix in the MAGMATRIX device. Prescribed magnetized water 1.5 liters 4 times a day. The course of treatment was 45 days. The course was repeated after 1 month. The course of treatment was 6 months.

It was prescribed the zeolite-containing drug "Zeolimed" for patients of III group. It is reported that the drug was examined by the Public Legal Entity "Analytical Expertise Center" of Ministry of Health of the Republic of Azerbaijan in accordance with letter No. 3-28-1 / 2-8414 / 2024 dated March 15, 2024 in order to determine whether the product "Zeolimed, capsules No. 60" manufactured by the Italian company "Gricar Chemical S.r.l.". According to the results of the examination, the product "Tseolimed, capsules No. 60" with serial number P119 is a biologically active food supplement recommended as a natural source of minerals, the doses of the ingredients contained in it do not exceed the upper daily allowable limit, and it is not a drug.

The drug "Zeolimed" - a zeolite-containing drug with antioxidant activity - was prescribed 2 capsules 2 times a day. The course of treatment was determined to be 30 days. After that, it was prescribed after a month's break.

Women included in group IV were prescribed the hormonal drug Mifepristone. Mifepristone was prescribed in a dose of 10-25 mg/day for 3 months for patients with small myomatous nodes and 25-50 mg/day for large myomatous nodes.

The obtained numerical data were processed using modern

statistical methods. The average values (M), their standard error (m), minimum (min) and maximum (max) values of the series, as well as the frequencies of occurrence of qualitative indicators in groups were determined. To calculate the average values between the selected quantitative indicators for the primary assessment of the difference between numbers and pairwise related variations, the parametric method of Student's t-test was used. To compare the obtained results, the nonparametric Wilcoxon U-test (Mann-Whitney) was used. Statistical processing of the obtained results was carried out using the applied computer program Statistica 7.0.

RESEARCH RESULTS AND THEIR DISCUSSION

The average age of women included in the study by groups was: I group – 36,86, II group – 35,28, III group – 36,24, IV group – 37,94 years. No significant statistically significant differences were recorded between women by age intervals (W=615,0, p=0,589, p>0,05).

It was determined menstrual cycle disorders, anemia characteristics, and myoma form in patients with uterine myoma included in the study. Normal menstruations were more common – 12% in IV group. Normal menstrual cycles were determined in 10% of patients in I group, 8% of patients in II group, and 6% of patients in III group (Table 1).

Table 1
Characteristics of menstrual function disorders before treatment in the studied groups

Menstrual disorders	I group		II group		III group		IV group	
	Abs.	%	Abs.	%	Abs	%	Abs.	%
Hyperpolymenorrhea	11	22	12	24	16	32	14	28
Dysmenorrhea	10	20	13	26	9	18	11	22
Menorrhagia	12	24	10	20	9	18	9	18
Metrorrhagia	12	24	11	22	13	26	10	20
Normal menstruation	5	10	4	8	3	6	6	12

Dysmenorrhea was registered with high frequency in study

groups. These women had intense and severe pelvic pain before menstruation, on the first day of menstruation, which began to decrease after 2-3 days of menstruation. More such patients were in the II group, it was recorded in 13 (26%) patients. In III group it was detected less common – in 9 (18%) women.

Menorrhagia, that is, a long menstrual cycle and heavy discharge, is a common occurrence in patients with uterine myoma. Patients with menorrhagia type menstrual disorders were more often registered in I group, in the group of patients who underwent surgical treatment, it was determined in 12 (24%) patients.

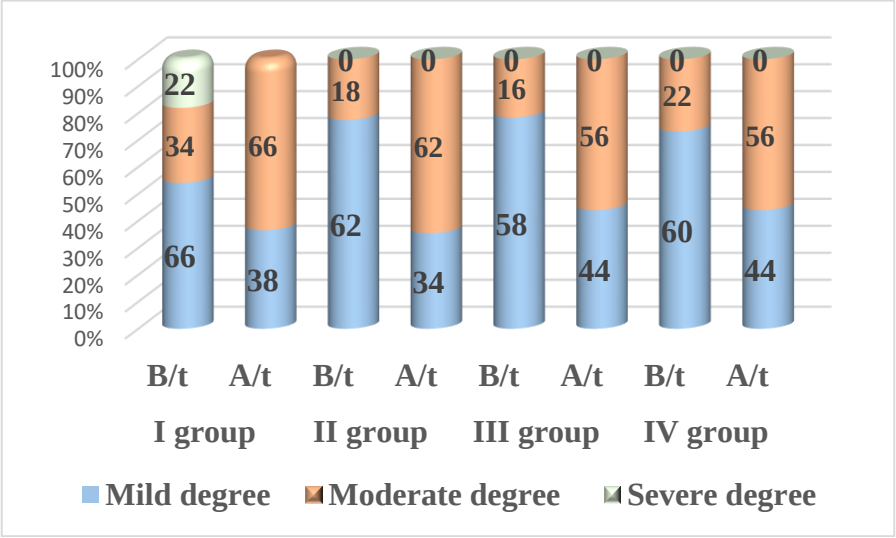
Women included in the study groups experienced metrorrhagia – bleeding between menstrual periods of varying intensity. More patients with such disorders of the menstrual cycle were identified in the III group (26%), in the group of women treated with zeolite. At the same time, a small number of patients with normal menstruation was recorded in III groups. More patients with normal menstruation were identified in the IV group – in the group of patients treated with hormonal preparations, they were detected in 6 (12%). In I group 5 (10%), in II group 4 (8%), and in IV group 6 (12%) women had normal menstruation.

Considering that uterine myoma are accompanied by massive bleeding and prolonged menstruation, we determined the hemoglobin level in the study groups.

In I group, which women underwent surgical treatment, it was not recorded the hemoglobin level in the range of 100-125 g/l. On the contrary, the number of patients with the hemoglobin level in the range of 80-89 g/l was higher in I group, accounting for 62%. Patients with the hemoglobin level of 79 g/l and below were registrated only in I group, accounting for 22% of patients. In the other 3 groups, it was not registrated patients with the hemoglobin level below 79 g/l before treatment. The hemoglobin level of 90-99 g/L was more common in II group accounting for 24% of patients. In IV group, the Hb level of 100-109 g/l was detected in 16% of patients. Lower Hb values of 80-89 g/l were detected in 42% of patients in II group, 36% in III group, and 40% in IV group.

We determined the severity of anemia before and after treatment based on the hemoglobin level in the study groups. Severe anemia was observed only in I group – 22%.

Before treatment, moderate anemia was observed in 62% of cases in II group and 56% in III and VI groups. After treatment, moderate anemia was approximately the same in II (18%) and III (16%) groups. Mild anemia increased from 34% to 62% in II group II, from 44% to 58% in III group III, and from 44% to 60% in IV group. Three types of myoma were detected in the patients: intramural, subserous and submucosal. Subserous myomatous nodes were more common – 38% in IV group and 22% in II group. Submucosal nodes were registered in 46% of patients in I group, 22% in patients in II group, and 18% in patients in III and IV groups (Graph 1).



Graph 1. The severity of anemia by groups of studies after treatment

Intramural myomatous nodes were registered in 16% of patients in I group, 56% in patients in II group, 58% in patients in III group and 44% in patients in IV group.

Submucosal type of myoma in I group was 46%, in III and IV groups – 18%, respectively. Intramural myoma was more often registered in III group – 58%. The number of such patients in I group was less - 16%. Intramural myomatous nodes were detected in 56% of cases in II group and in 44% in IV group. Submucous nodes prevailed in I group, 12% more than in II group, and 14% more than in III and IV groups. Intramural nodes prevailed in II group, 20% more than in I group, and 6% more than in IV group. Myomatous nodes of the intramural type prevailed in III group, 21% more than in I group, 1% more than in II group, and 7% more than in IV group. Nodes of the intramural type also prevailed in IV group compared to other types.

The number of myomatous nodes was determined by groups. Thus, 58% of patients with a smaller number of nodes from 1 to 5 were in IV group, 48% in I and II groups, and 54% in III group. More patients with the number of myomatous nodes from 6 to 10 were in II group, which amounted to 44%. In I group, 40% were recorded, in III group - 36%, in IV group - 34%. The largest number of patients with the number of nodes from 11 to 15 was in III group, which amounted to 10%. Fewer such patients were in I group, which amounted to 6%.

One of the characteristic instrumental signs of uterine myoma is the type of vascularization. We determined the type of vessels in myomatous nodes in uterine myoma using Dopplerography. In I group, that is, in the group of patients who underwent surgical treatment, the non-vascular type of angiogenesis was absent. Nonvascular nodules were detected in 38% of patients in II group, 36% of patients in II group, and 42% of patients in IV group. Peripheral angiogenesis was more often observed in III group and accounted for 64%. This type of angiogenesis was peripheral in 36% of patients in group I, 60% of patients in II group, and 40% of patients in IV group.

The studies showed that the more severe types of angiogenesis are the central and mixed types. The central type of vascularization prevailed in I group, occurring in 15 (30%) patients. The central type of angiogenesis was detected in 12 (24%) patients in II group, in 10 (20%) in III group, and in 9 (18%) in IV group. A more dangerous

type of angiogenesis, the mixed type, was more often detected in I group I, in 17 (34%) patients. However, no patient in the other groups had this type of angiogenesis.

Thus, the highest type of vascularization was determined only in III group compared to all patients. It was the peripheral type of blood flow, which was 64%. This is 28% more than in I group, 4% more than in II group, and 24% more than in IV group. There was no non-vascular myomatous vascularization in I group. We can also explain this by the absence of small myomatous nodes in this group.

Our study showed that the larger the size of the myomatous nodes, the higher the frequency of central and mixed vascularization. In these patients, the volume of myomatous nodes was larger, and the bleeding was longer and more intense. Women treated with zeolite and magnetized water had 6% less moderate anemia than women receiving hormonal therapy.

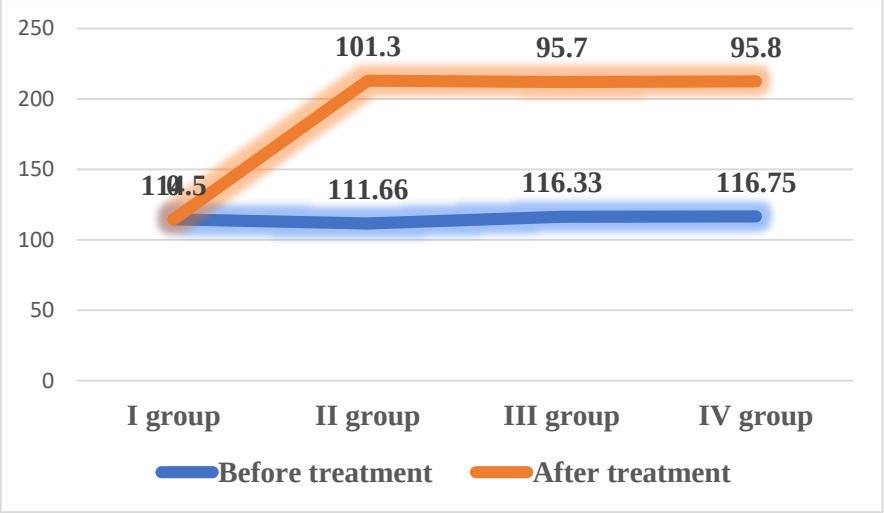
In the course of our studies, we determined the change in the volume of myomatous nodes as the main marker for determining the effectiveness of the treatment method with magnetized water and zeolite.We considered it appropriate to use the following classification when determining the volume of the myomatosis nodule:

- small – linear dimensions up to 3 cm (volume – up to 15 cm^3);
- medium – from 3 cm to 6 cm (volume from 15 to 100 cm^3);
- large – more than 6 cm (volume more than 100 cm^3).

Myomatous nodes with a volume of up to 15 cm^3, as a rule, were not registered in women who had undergone surgical treatment before the treatment. In II group, nodes with a volume of up to 15 cm^3 were detected in 38% of cases, in III group – in 42%, and in IV group – more than 44% of cases. The border of myomatous nodes of 16-100 cm3 was detected more often in III group – in 52% of cases. Nodes smaller than this border were detected in I group – in 24% of cases. Myomatous nodes in the range of 16-100 cm^3 were detected in II group – in 38% of cases, in IV group– in 44% of cases. The number of myomatous nodes with a volume of more than 101 cm^3 was higher in group, that is, in the group of patients who had undergone surgical I treatment, in 48,0% of cases. There were fewer of them in III group –

in 6% of cases. Myomatous nodes larger than 101 cm^3 were detected in 26% of patients in II group and in 12% of patients in IV group.

After treatment, myomatous nodes larger than 101 cm^3 were not detected in patients who received zeolite and hormonal therapy. In III group, the average node volume was 16-100 cm^3 in 52% of cases, and up to 15 cm^3 in 48%. In IV group, the average node volume was 16-100 cm^3 in 46% of cases, and up to 15 cm^3 in 54%. In II group (magnetized water), the average node volume after treatment was 16-100 cm^3 in 50% of cases, and up to 15 cm^3 in 44%. However, in this group, myomatous nodes larger than 101 cm^3 were found in 6% of cases. The average volume of the dominant myomatous node before treatment was 114,5 cm^3 in the group of women who received surgical treatment, 111,66 cm^3 in the group of women who received treatment with magnetized water, 116,33 cm^3 in the group of women who received treatment with zeolite, and 116,75 cm^3 in the group of women who received hormonal treatment.



Graph. Dynamics of change in the average volume of dominant myomatous nodes before and after treatment in the study groups

After treatment, the volume of the dominant node in the group of women treated with magnetized water decreased from 111,66 cm^3 to 101,3 cm^3, the difference was 10,36 cm^3. In the III group of women treated with zeolite, it decreased from 116,33 cm^3 to 95,7 cm^3, the difference was 20,63 cm^3. In the IV group of women who were prescribed hormonal treatment, it decreased from 116,75 cm^3 to 95,8 cm^3, the difference was 20,95 cm^3.

Considering that uterine myoma cause changes in the blood coagulation system, we also studied the rheological properties of blood in patients included in the study groups and conducted a comparative analysis of such indicators as fibrinogen, international normalized ratio (INR), prothrombin, antithrombin III and D-dimer (Table 2).

Table 1
Comparative presentation of coagulogram indicators in study groups after treatment

Indexes	I group	II group	III group	IV group
Fibrinogen, g/l	2,82±0,31	2,86±0,24	2,84±0,26	2,83±0,26
INR	1,15±0,99***	0,65±0,31***	0,38±0,10***	0,37±0,21***
		p II/IV <0,001 p I/III<0,001	p II/III <0,001 p I/III<0,001	p I/IV<0,001
Prothrombin time, seconds	11,03±0,99	11,10±1,01	10,28±3,12	11,02±1,04
Antithrombin III, %	96,84±17,67	97,71±21,37	94,16±16,54	94,84±16,55
D-dimer, µg/mL	0,34±0,16	0,30±0,13	0,29±0,12	0,30±0,13
			p I/III <0,05	

Before and after treatment, we determined parameters such as D-dimer, prothrombin time, fibrinogen, INR, antithrombin III.

After treatment, statistically significant differences between II and III (W=1185,0, p=0,649, p>0,05), II and IV (W=1251,0, p=0,994, p>0,05), I and III (W=1260,0, p=0,944, p>0,05), II and IV (W=1315,0, p=0,648, p>0,05), I and II (W=1309,0, p=0,680, p>005), I and IV (W=1246,0, p=0,978, p>0,05) groups according to fibrinogen parameters were not revealed. After treatment, indicators of INR were statistically significantly higher in II group than in III group (W=598,5, p<0,001). In II group, it decreased less than in III group. A statistically significant decrease was observed in group IV

compared to III group (W=1449,0, p=0,170, p>0,05). A statistically significant decrease was observed in group I compared to group III (W=0, p<0,001). Such a difference was observed between groups II and IV (W=1940,5, p<0,001), and also between I and II groups (W=485,5, p<0,001). There was no statistically significant difference in the reduction of INR between I and IV groups (W=75.0, p<0.001).

After treatment, there were statistically significant differences between II and III (W=1194,5, p=0,701, p>0,05), III and IV (W=1233,5, p=0,909, p>0,05), I and II (W=1228,5, p=0,882, p>0,05), II and IV (W=1299.5, p=0.732, p>0.05), I and II (W=1296,0, p=0,751, p>0,05) and I and IV (W=1242,0, p=0,956, p>0,05) groups.

After treatment, no statistically significant differences in antithrombin III levels were found between II and III (W=1167,5, p=0,569, p>0,05), III and IV (W=1249,0, p=0,994, p>0,05), I and III (W=1166,0, p=0,562, p>0,05), II and IV (W=1332,5, p=0,569, p>0,05), I and II (W=1254,0, p=0,978, p>0,05), I and IV (W=1189,0, p=0,674, p>0,05) groups.

After treatment, a reliable difference in D-dimer levels was found only in I group (0,34±0,16 ng/ml) – in the group of patients who underwent surgical treatment, and in III group (0,29±0,12 ng/ml) – in the group of patients who underwent zeolite treatment. A statistically significant difference was observed between the groups of patients (W = 129,0, p = 0,033, p<0,05). In III group, the D-dimer level decreased more intensively. Other groups: II and III (W=1199,5, p=0,727, p>0,05), III and IV (W=1192,5, p=0,691, p>0,05), II and IV (W=1243,5, p=0,964, p>0,05), I and II (W=1090,5, p=0,271, p>0,05), and no statistically significant differences were found between I and IV (W=1097,0, p=0,291, p>0,05) groups.

Fibrinogen decreased more in IV group (2,83 g/l) after treatment. However, this decrease was very insignificant. The decrease in INR after treatment was greater in IV group, it was 0,37, which was 0,78 in I group, 0,27 in II group II and 0.01 units less than in III group. Prothrombin time decreased more in III group after treatment, it was 10,28 seconds less than in I group, 0,74 seconds less than in IV group.

Antithrombin III and D-dimer indicators also decreased more in III group.

The results of the study showed that in all groups the coagulogram indices normalized after the treatment. Fibrinogen, INR, prothrombin time, D-dimer statistically significantly decreased, and antithrombin III statistically significantly increased. This also proves that the results of the proposed treatment measures using magnetized water and zeolite changed at the same level as the indices of hormonal and surgical treatment, their effectiveness is similar to traditional treatment regimens.

Thus, an analysis of the studies of the characteristics of the blood coagulation system in patients with uterine myoma showed that this disease leads to the development of hypercoagulation, but the state of hemostasis is often considered compensated and patients are not prescribed hemostasis correction.

From the studies conducted, it became known that steroid hormones are involved in the pathogenesis of myoma.

A factor of particular significance in the development of myomatous nodes is considered to be an increase in the level of luteinizing (LH) and follicle-stimulating hormone (FSH).

It has been established that prolactin is synthesized in uterine myoma cells. It is considered that prolactin, along with progesterone, is a growth factor for myomatous nodes.

Considering that uterine myoma are benign hormone-sensitive tumors, we conducted a comparative analysis of the results of hormonal studies (Table 3).

Table 3
Analysis of hormonal parameters after treatment in the study groups

Hormones	I group	II group	III group	IV group
FSH, mIU/ml	11,54±5,78	7,482±1,65	9,196±5,13	8,769±3,86
LH, mIU/ml	18,814±2,88	18,451±8,46	16,404±5,003	15,828±4,51
Prolaktin, mIU/ml	27,398±2,25	27,34286±8,73	27,578±4,39	28,947±7,12
Estradiol, IU/l	1,1892±0,17	1,0908±0,46	1,1078±0,37	1,101±0,101
Progesteron, IU/l	71,3±10,98	68,552±10,56	70,07±11,25	69,88±7,704

There was no statistically significant difference between the groups in levels of FSH after treatment.

After treatment, a decrease in LH levels was recorded in all groups. In IV group, it was statistically significantly lower than in I group ($p<0,005$), group II ($p=0,0477$, $p<0,05$), III group ($p=0,04236$, $p<0,05$).

After treatment, progesterone levels decreased in all groups, but there was no statistically significant difference. After treatment, estradiol levels decreased between the groups. The differences between I and IV groups ($p<0,00001$, $p<0,05$), II ($p=0,22246$, $p<0,05$) and group I ($p=0,0004$, $p<0,05$) were statistically significant. Estradiol levels in patients who received surgical treatment were statistically significantly lower than in patients who received hormonal treatment, zeolit and magnetized water.

Thus, after treatment, a decrease in the levels of FSH, LH, prolactin, estradiol and progesterone was noted in the groups. Although this decrease was more pronounced in the hormonal group, there were no statistically significant differences compared to the groups treated with magnetized water and zeolite. This indicates that the positive effects of the treatment measures we proposed have a positive effect on the hormonal profile, thereby reducing the volume of myoma and normalizing the overall hormonal status.

We compared and discussed the levels of thrombocytes, red blood cells, and white blood cells from clinical blood tests in patients included in the study group.

Thrombocytes increased by 67,1 $x10^9$/l, leukocytes increased by 9,9x10 /l. In patients of I group, erythrocytes before treatment ($3,65\pm0,42x10^{12}$/l) after treatment ($2,74\pm0,44x10^{12}$/l) ($T=-10,54$, $p\leq0,001$), leukocytes before treatment ($16,82\pm4,63$) after treatment ($6,94\pm1,70x10^9$/l) ($T=14.15$, $p\leq0.001$), thrombocytes before treatment ($239,14\pm40,25$ $x10^9$/l) after treatment ($306,24\pm59,52$ $x10^9$/l) statistically significantly differed ($T=-6.60$, $p\leq0.001$). In II group, erythrocytes before treatment ($2.78\pm0,4210^{12}$/l) statistically significantly differed from ($3,69\pm0,4310^{12}$/l) after treatment (T = -

10.72, p≤0.001), leukocytes before treatment (16,74±4,5710^9/l) from (7,31±1,61 x10^9/l) after treatment (T =13,76, p≤0.001), thrombocytes before treatment (239,12±41,22 x10^9/l) from (303,34±59,23 x10^9/l) after treatment (T = -6,29, p≤0,001).

In III group, the red blood cell level before treatment (2,75±0,46 x 10^{12}/l) was statistically significantly lower than the level after treatment (3,72±0,43 x 10^{12}/l) (T = -10.83, p≤0.001). The leukocyte level before treatment (15,90±3,96x10^9/l) was statistically significantly lower than the level after treatment (7,52±1,57 x 10^9/l) (T=13,92, p≤0,001), and the level of thrombocytes before treatment (235,22±40,13 x 10^9/l) was statistically significantly higher than the level after treatment (305,44±60,16 x10^9/l) (T= -6,87, p≤0,001). After treatment, the average thrombocytes count increased to 70,2 x10^9/l and the average white blood cell count increased to 8,4 x10^9/l. In III group, red blood cells were statistically significantly different before treatment (2,80±0,41 x10^{12}/l) and after treatment (3,66±0,42 x10^{12}/l) (T = -10,44, p≤0,001), white blood cells were statistically significantly different before treatment (15,76±4,08 x10^{12}/l) and after treatment (7,55±1,58 x10^{12}/l) (T=13,27, p≤0,001), and thrombocytes were statistically significantly different before treatment (237,76±37,16 x10^9/l) and after treatment (309,36±61,66 x10^9/l) (T = -7.03, p≤0.001). There were no statistically significant differences in red blood cell, white blood cell, and thrombocytes counts between groups before treatment.

After treatment, no statistically significant differences were found between I and II groups (T=0,438, p=0,663, p>0,05), III and IV groups (T=0,747, p=0,459, p>0,05), I and III groups (T=1,019, p=0,313, p>0,05), II and IV groups (T=0,383, p=0,703, p>0,05), I and II groups (T=0,794, p=0,431, p>0,05), I and IV groups (T=0,175, p=0,862, p>0,05) in erythrocyte indices. There were no statistically significant differences in the white blood cell count after treatment between II and III (T= 1,221, p=0,228, p>0,05), III and IV (T = -0.122, p=0.903, p>0.05), I and III (T = 1.949, p=0.057, p>0.05), II and IV (T = -0,897, p=0,374, p>0,05) and I and II (T = 1.485, p=0.144, p>0.05) groups. Statistically significant difference in the white blood cell count

after treatment was found only between patients who received surgery and hormonal treatment (T =2,544, p=0,014, p<0,05). The white blood cell count was statistically significantly lower in patients who received surgical treatment compared with hormonal treatment.

As can be seen, there were some significant differences in some clinical blood parameters between the groups. The results show that zeolite and magnetized water have a positive effect on the treatment of patients with uterine myoma. In this regard, the possibility of using both treatment methods as alternatives is confirmed.

The quality of life of women included in the study was determined using the Uterine Myoma Symptoms and Quality of Life Questionnaire (UFS – QOL). The survey was conducted immediately before treatment and 6 months after treatment. A total of 150 patients were included in the survey. It was not possible to include patients who had undergone surgical treatment in the survey due to various objective (their condition after treatment differed from the condition of women who had not undergone surgery) and subjective aspects (women who had undergone surgical treatment were analyzed based on their anamnesis, and it was not possible to include most of them in the survey).

The first part of the questionnaire consists of questions designed to explore the extent to which uterine fibroids limit women.

According to the limitations survey, in II group before treatment, severe massive bleeding accounted for 30%, blood clots during menstruation – 36%, prolonged menstruation – 68%, pelvic pain – 82%, frequent urination during the day – 36%, at night – 42%, severe fatigue – 90%. After treatment, none of these were recorded, only severe fatigue remained in 18%.

In III roup , severe massive bleeding accounted for 38%, blood clots - 30%, prolonged menstruation - 62%, intense pain - 34%, frequent urination during the day - 32%, at night - 58%, severe fatigue - 90%. After treatment, the severity of these complaints did not persist, only severe fatigue remained in 16%. In IV group, severe massive bleeding accounted for 32%, the release of blood clots – 30%, prolonged menstruation – 50%, intense pain – 38%, frequent urination

during the day – 32%, at night – 48%, severe fatigue – 90%. After treatment, the severity of these complaints did not persist, only severe fatigue remained in 26%.

The second part of the questionnaire consists of questions designed to identify the presence of symptoms associated with uterine fibroids after treatment.

Severe symptoms of uterine fibroids in II group were sudden menstruation in 72%, difficulty in physical activity in 64%, decreased activity in 34%, and high body weight in 54%. After treatment, sudden menstruation in 16%, difficulty in physical activity in 16%, and decreased activity in 9%. There were no women with high body weight after treatment.

Severe symptoms of uterine fibroids in III group were sudden menstruation in 64%, difficulty in physical activity in 58%, decreased activity in 32%, and high body weight in 36%. After treatment, sudden menstruation in 8%, difficulty in physical activity in 12%, and decreased activity in 2%. There were no women with high body weight after treatment.

Severe symptoms of uterine fibroids were recorded in IV group: sudden menstruation 58%, difficulty doing physical exercise 48%, decreased activity 22%, increased body weight 28%. After treatment, sudden menstruation 16%, difficulty doing physical exercise 14%, decreased activity 4%. After treatment, 2% of women were overweight, in contrast to II and III groups.

The third part of the questionnaire consists of questions aimed at assessing the psychological and emotional state of women with uterine fibroids.

Before treatment, in II group, severe depression was recorded in 40%, shyness 26%, bad thoughts 10%, strong irritability 58%, difficulty choosing clothes 32%, and sexual dysfunction in 26%. After treatment, there were no women with severe depression, bad thoughts, or a high sense of shame. Severe irritability-excitability remained in 8%, and difficulties in dressing in 8%.

Before treatment in III group, severe depression was recorded in 38%, shyness in 30%, negative thoughts in 18%, severe irritability in

62%, difficulties in choosing clothes in 24% and sexual dysfunction in 28%. After treatment, severe depression remained in 3%, severe irritability-excitability in 8%. After treatment, there were no women who were obsessed with serious thoughts, had a high sense of shame or experienced difficulties in dressing.

Before treatment, severe depression in 38%, shyness in 38%, negative thoughts in 32%, severe irritability in 42%, difficulties in choosing clothes in 30% and sexual dysfunction in 24%. After treatment, severe depression was found in 3%, negative thoughts in 14%, difficulties with dressing in 16%, and severe irritability in 8%. Severe shyness and severe sexual dysfunction were not recorded among women.

Optimal algorithm for treating women with uterine myoma of reproductive age. As a result of the research work, we have developed an algorithm for treating and examining uterine myoma in women of reproductive age (Figure 2).

It is based on determining the size of the myomatous node, especially its volume, based on ultrasound data. Thus, myomatous nodes up to 15 cm^3 are considered small in size.

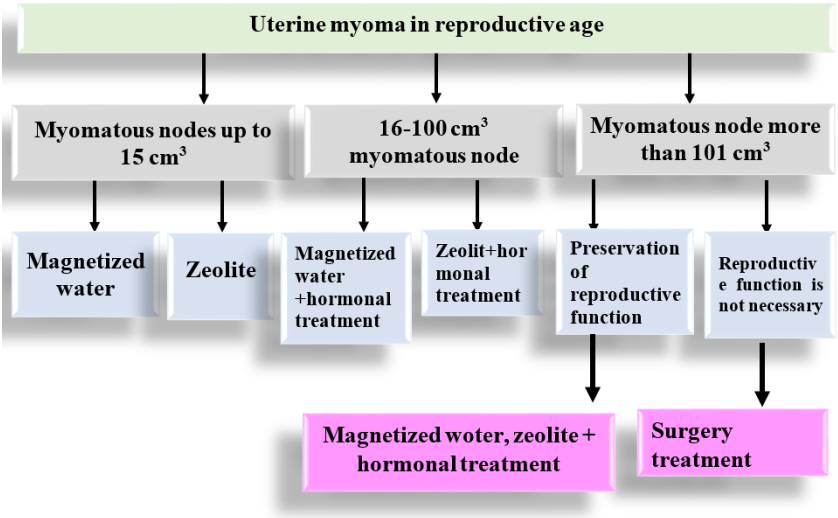


Figure 2. Optimal algorithm for examination and treatment of uterine myoma in reproductive age

In our opinion, in this case it is possible to limit the treatment to prescribing only magnetized water or zeolite. Since the effectiveness and positive clinical and biological properties of both treatments allow to achieve a significant reduction in the volume of the node in a short time without any side effects, as well as to prevent the process of repeated growth of myomatous nodes with normalization of hormonal parameters. In this case, it is possible to achieve a reduction in the volume of the node by prescribing magnetized water 1.5 liters 4 times a day (treatment course 45 days) or the drug "Zeolimed" 2 capsules 2 times a day (30 days).

In patients with a myomatous node volume of more than 101 cm^3, the patient's reproductive function, the woman's desire to have a child and the desire to avoid the risk of surgical intervention should be taken into account. This scheme allowed to achieve an effective reduction of myomatous nodes, normalization of hormonal levels and acceleration of recovery processes in the body without intervention.

RESULTS

1. The main risk factors for the development of uterine myoma in women of reproductive age were registered: in I group – 40 years and older (22%); hereditary predisposition (68%), in the IV group – inflammatory diseases of the uterus (20%); in II group – obesity (54%), COC reception (22%). By type of subserous nodules in I and IV groups – 38%; submucosal in I group – 46%, intramural in III group – 58% [6].

2. It was not statistically significant differences in the volume of nodes after treatment between the groups of patients treated with magnetized water and zeolite ($p<0.05$). There was no statistically significant difference between the groups in the reduction in the volume of nodes after treatment. After treatment, the volume of the dominant node in the group of women treated with magnetized water

decreased from 111,66 cm^3 to 101,3 cm^3, in women treated with zeolite it decreased from 116,33 cm^3 to 95,7 cm^3, in group IV, consisting of women who were prescribed hormonal treatment, it decreased from 116,75 cm^3 to 95,8 cm^3. After treatment, nodes exceeding 101 cm^3 were detected in 6% of women treated only with magnetized water [15].

3. After treatment, the mean INR in the group of patients treated with magnetized water was statistically significantly higher than in the patients treated with zeolite ($W_{II/III}$=598,5, p<0,001), and in patients treated with hormonal therapy, the INR was statistically significantly lower than in the patients treated with zeolite ($W_{III/IV}$=1449,0, p=0,170, p>0,05). In the group of patients treated with surgical therapy, it was statistically significantly lower than in the patients treated with zeolite ($W_{I/III}$=0, p<0,001). The same difference was observed between patients treated with magnetized water and those treated with hormonal therapy ($W_{II/IV}$=1940,5, p<0,001), and between patients treated with surgical therapy and magnetized water ($W_{I/II}$=485,5 p<0,001). No statistically significant differences were found between the groups in other parameters [7,8,11,14].

4. After treatment, there were significant differences in LH levels between the magnetized water and surgical treatment groups (p=0,0477, p<0,05), and between the zeolite group and the surgical treatment group (p=0,04236, p<0,05). There was no significant difference in prolactin levels between the groups after treatment. After treatment, estradiol was significantly lower in the surgical treatment group compared to the hormonal treatment (p<0,00001) and magnetized water groups (p=0,22246) [13].

5. After treatment, menstrual bleeding, clotted discharge, menstrual duration decreased by 50% in group I, pelvic pain by 44%, daytime urination by 20%, nighttime urination by 12%, and fatigue by 72%. In group II, massive bleeding, clotted discharge, and prolonged bleeding were absent in groups III and IV. The following changes were observed in the indicators related to the psychological-emotional state: after treatment II, III and IV: depression, 0%, 8%, 16%; health anxiety 20%, 14%, 16%, caution in work – 14%, 0%, 14%, hopeless thoughts

0%, 0%, 14%, irritability – 12%, 8%, 8%, energy depletion – 6%, 10%, 16%, caution in clothing – 8%, 0%, 16% [12].

6. The algorithm we propose is based on the selection of treatment regimens based on the indicators of instrumental examination. Thus, it is proposed to be content with the appointment of treatment with magnetized water or zeolite for small myomatous nodes up to 15 cm3. When the volume of the myomatous node is 16-100 cm3, we consider the appointment of magnetized water or zeolite along with hormonal treatment to be highly effective. In patients with a node volume of more than 101 cm^3, it is advisable to appoint hormonal treatment + zeolite + magnetized water if the women reproductive function is already in question [3,9,10].

PRACTICAL RECOMMENDATIONS

1. Depending on the size of the node, it is advisable to replace hormonal treatment with magnetized water or zeolite, and surgical treatment with complex treatment with hormonal treatment, zeolite and magnetized water. It can be considered safe and effective to take the drug "Tseolimed" 2 capsules twice a day and 1.5 liters of magnetized water per day for 45 days.

2. When prescribing treatment for uterine myoma, it is advisable to take into account not only the effectiveness, but also the safety, as well as the woman's desire to preserve reproductive function.

3. It is necessary to highlight the relief of symptoms, prevention of regression of myomatous nodes and maximum preservation of reproductive function as priority treatment goals.

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LIST OF CONVENTIONAL ABBREVIATIONS

FSH – follicle stimulating hormone
Hb – hemoglobine
INR – international normalized ratio
KOK – kombinəedilmiş oral kontraseptivlər
LH – luteinizing homone
UFS – QOL - Uterine Fibroid Symptom and Quality of Life
USR– Ultrasound research

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