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# The microelement status of girls suffering from juvenile uterine bleeding

Gulnoz Sh. Mavlonova., Gulchexra A. Ikhtiyarova.,
Ikrom I. Amonov., Zamira Sh.Kurbanova
*Medical State Institute Abu Ali Ibn Sino, Department of Obstetrics and Gynecology, Ministry of Health of the Republic of Uzbekistan.*

***Abstract: Objective: To study the effect of microelementosis of the body on the development of juvenile uterine bleeding in girls. The study involved 56 girls with juvenile uterine bleeding and 27 girls, recognized as "practically" healthy at the age of 12 to 16 years. The study of ME blood composition was carried out in the Republican center for forensic examination.Thus, blood MEs are highly correlated with both clinical and laboratory parameters of juvenile uterine bleeding. The lack of such essential MEs as iodine, iron, selenium, zinc, cobalt have direct correlations with menstrual irregularities. In contrast, girls suffering from JMC show elevated levels of toxic MEs such as beryllium, aluminum, and mercury***

***Keywords: juvenile uterine bleeding,microelementos,essential trace elements,toxic trace elements***

## 1. Introduction

Microelements (MEs) are chemical elements that are found in very small quantities in humans and animals. These are the components of the naturally existing very ancient and complex physiological system involved in the regulation of all vital functions at all stages of development [1, 3, 4, 7].

The absence or deficiency in food of one element can cause a violation of body functions. So, a lack of iodine can cause the development of goiter, and a low fluorine content - caries, baldness, gastritis, enteritis. Zinc deficiency in a child is manifested by a decrease in short-term memory, spatial thinking, a weakening of the ability to learn and master social skills, in adults it can disrupt behavioral reactions [2, 5, 6]. The effect of certain trace elements on reproductive function has also been proven. So, zinc is involved in the formation of sensitivity, fertilization, growth factors, against the background of zinc deficiency, sexual development can be delayed. Copper deficiency can cause girls to delay puberty, and in women, infertility and decreased sex drive. Cobalt in combination with other trace elements increases sexual function, promotes secretory regulation of the hormones of the hypothalamus, pituitary, adrenal and gonads. Lack of selenium leads to fairly early changes in the genitals. According to Schauzer G.N. (2008), increasing the selenium content in food to 0.65 μg reduced the incidence of tumors to 30%, showing antitumorogenic effects of selenium. According to N.F. Latsis (1999), in patients with prolonged uterine bleeding, the zinc content in the blood decreases; with uterine fibroids, the concentration of copper, manganese, silicon, titanium increases.[9, 11, 10].

Trace elements are among the indispensable nutritional factors, the adequate intake of which in the body is a necessary condition for ensuring health and performance [2,4,8,11]. Strict adherence to this condition is especially important in childhood, due to the metabolic intensity, processes caused by the intensive growth and development of children, combined with the immaturity of their regulation [7, 5, 10], an important contribution to which is made by essential trace elements.

**2. Objective**:

To study the effect of microelementosis of the body on the development of juvenile uterine bleeding in girls.

**3. Material and methods**:

The study involved 56 girls with juvenile uterine bleeding and 27 girls, recognized as "practically" healthy at the age of 12 to 16 years. The study of ME blood composition was carried out in the Republican center for forensic examination.

To determine the ME, serum and erythrocyte samples were burned in concentrated nitric acid, an aliquot was taken and diluted with 1% nitric acid to working concentrations and precipitated by centrifugation.

The microelement composition of the samples prepared by the method described above was determined on an AT 7500 a device (Agilent 7500 a. Inductively Coupled Plasma Mass Spectrometer. Japan, 2001): argon carrier gas, power 1310 W, integration time 0.1 s. The content of ME in biological media is presented in μg%. Essential MEs were determined - chromium, manganese, iron, cobalt, copper, zinc, selenium, molybdenum, iodine, and toxic ones - beryllium, aluminum, cadmium, mercury, lead. Blood sampling from patients was carried out in the morning. A comprehensive study of the concentration of ME in blood serum and red blood cells in the follicular (7 days), ovulatory (14 days) and luteal (21 days) phases of the ovarian cycle was carried out.

The content of ME in the blood of girls with juvenile uterine bleeding (Table 2.) is of significant interest. Thus, in contrast to healthy girls, girls of the main group have a significant decrease in a number of essential trace elements, such as iron (136.4 ± 9.3 μg% in healthy blood serum and 128.6 ± 8.8 μg% in girls with juvenile uterine bleeding ; respectively 48.3 ± 3.1 μg% and 41.6 ± 3.2 in red blood cells), cobalt (5.3 ± 0.4 μg% in healthy blood serum and 4.8 ± 0.3 μg% in girls with juvenile uterine bleeding; respectively 17.3 ± 1.3 μg% and 13.2 ± 0.9 in red blood cells), copper (154.8 ± 12.4 μg% in healthy serum and 161.4 ± 11 , 3 μg% in girls with juvenile uterine bleeding; respectively 120 ± 8.6 μg% and 101.4 ± 8.4 erythrocytes), zinc (121 ± 8.9 μg% of serum in healthy people and 104.6 ± 8.6 μg% in girls with juvenile uterine bleeding; respectively 623 ± 36.2 μg% and 516 ± 38.3 erythrocytes), selenium (14.1 ± .0.63 μg% in healthy serum and 11.6 ± 0.9 μg % in girls with juvenile uterine bleeding; resp.18.6 ± 8.6 μg% and 15.4 ± 0.8 erythrocytes), iodine (7.6 ± 0.6 μg% serum in healthy individuals and 6.5 ± 0.45 μg% in girls with UMC; respectively 19.8 ± 1.2 μg% and 22.8 ± 1.7 red blood cells) and others.

We were not able to single out a special difference in the concentration of toxic microelements in the comparative aspect, with the exception of cadmium (23.6 ± 1.9 μg% of blood serum in healthy people and 27.1 ± 1.9 μg% in girls with juvenile uterine bleeding; respectively, 26, 7 ± 3.1 μg% and 26.7 ± 3.1 erythrocytes). Probably, this provision once again testifies to the gradual and cumulative accumulation of toxic ME in the human body.

The concentration of iron in the blood in girls with juvenile uterine bleeding after bleeding is distributed as follows; 1-3 days of the cycle, its level in blood serum is 12.1 ± 8.8 μg%, in red blood cells 41.6 ± 3.2 μg%, day 7, respectively. - 121 ± 10.3 and 38.6 ± 2.4 μg%, day 14, respectively. - 124.6 ± 10.3 and 90.4 ± 3.4 μg%, 21 days respectively. - 122 ± 9.8 and 38.6 ± 2.8 μg%. Moreover, in contrast to healthy girls, in girls with juvenile uterine bleeding, the concentration of iron in the blood was characterized by a reliably low concentration and monotony, regardless of the days of the alleged menstruation ($P < 0.05$).

Table 1

**The dynamics of the microelement composition of blood in "practically" healthy girls depending on the day of the menstrual cycle**

| M | **Days of the menstrual cycle** | | | |
|---|---|---|---|---|
| | 1-3 days | 7 day | 14 day | 21 day |

| E | sera.blood | erythr | sera. bloods | erythr | sera. bloods | erythr. | sera. bloods | erythr. |
|---|---|---|---|---|---|---|---|---|
| | | | | Essentialtraceelements | | | | |
| Cr | 56,7±2,4 | 66,2±4,8 | 58,1±3,6 | 65,3±4,5 | 71,7±6,3** | 67,2±4,1 | 60,3±3,9* | 65,6±5,1 |
| Mn | 11,2±0,9 | 24,3±2,1 | 13,3±0,9 | 24,1±2,1 | 16,8±1,3* | 25,3±1,9* | 12,6±1,3 | 23,4±1,1* |
| Fe | 136,4±9,3 | 48,3±3,1 | 128,6±11,3 | 51,6±4,8 | 138±11,6 | 55,3±4,1** | 127,3±19,6 | 52,3±4,2* |
| Co | 5,3±0,4 | 17,3±1,3 | 5,8±0,31 | 18,4±1,2 | 6,2±0,6 | 19,3±1,2* | 6,0±0,56 | 17,2±1,8 |
| Cu | 154,8±12,4 | 120±8,6 | 121±9,6* | 128,3±11,4 | 109±8,6*** | 131,4±12,1* | 113,6±10,6** | 128±10,3* |
| Zn | 121±8,9 | 623±36,2 | 127,4±11,3 | 646±48,3 | 144,8±9,8** | 778±54,6*** | 136,3±11,8 | 726,3±53,1** |
| Se | 14,1±0,63 | 18,6±0,9 | 15,2±1,3 | 19,1±1,3 | 14,6±1,6 | 23,6±1,9* | 12,3±0,9 | 17,6±1,1 |
| Mo | 1,2±0,09 | 1,1±0,08 | 1,1±0,08 | 1,3±0,09 | 0,9±0,008* | 1,1±008 | 1,3±0,07 | 1,1±0,08 |
| I | 7,6±0,6 | 22,8±1,7 | 7,8±0,5 | 24,6±1,8 | 9,6±0,7** | 28,6±2,1 | 8,3±0,6* | 22,7±2,0 |
| Ni | 7,8±0,43 | 16,3±1,2 | 7,6±0,51 | 17,6±1,3 | 7,6±0,3 | 17,9±1,1* | 7,3±0,3 | 17,1±1,3 |
| Toxictraceelements | | | | | | | | |
| Be | 0,53±0,02 | 0,2±0,08 | 0,51±0,032 | 0,22±0,09 | 0,5±0,05 | 0,24±0,018 | 0,49±0,04 | 0,25±0,019* |
| Al | 253±24,6 | 268±33,1 | 268±18,3 | 236±18,6* | 251±19,6 | 230±20,8** | 273±26,3* | 254±22,4 |
| Cd | 23,6±1,9 | 26,7±3,1 | 25,3±2,1 | 24,8±2,2 | 22,2±2,6* | 24,1±1,9* | 24,6±1,8 | 27,3±2,2 |
| Hg | 0,31±0,08 | 0,22±0,02 | 0,33±0,07 | 0,18±0,02 | 0,3±002 | 0,17±0,02* | 0,3±0,02 | 0,19±0,01 |
| Pb | 30,6±2,8 | 23,1±1,8 | 28,6±2,0 | 24,6±1,9 | 26,8±1,8* | 22,1±2,1* | 29,6±2,2 | 23,8±2,1 |

Table 2

**The dynamics of the microelement composition of blood in girls with juvenile uterine bleeding depending on the day of the menstrual cycle**

| ME | Days of the menstrual cycle | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1-3 days | | 7 day | | 14 day | | 21 day | |
| | sera.blood | erythr | sera.blood | erythr | sera. blood | erythr | sera.blood | erythr. |
| | | | | Essentialtraceelements | | | | |
| Cr | 57,1±3,1 | 61,3 ±4,6 | 57,8 ±2,7 | 64,3 ±4,6 | 58,1±3,3 | 63,9±6,1 | 62,8±4,4 | 64,1±3,4 |
| Mn | 12,1±0,8 | 23,8 ±1,4 | 13,7±0,9 | 23,7 ±1,4 | 14,1±1,3 | 22,3±1,8 | 13,6±0,7 | 23,7±1,8 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Fe | 128,6 ± 8,8 | 41,6 ±3,2 | 121 ± 10,3 | 38,6 ± 2,4 | 124,6 ± 10,3 | 90,4±3, 4 | 122±9,8 | 38,6±2,8 |
| Co | 4,8 ± 0,3 | 13,2 ±0,9 | 4,6 ± 0,28 | 11,4 ± 0,9 | 4,1±0,33 | 11,8±1, 1 | 3,8±0,29 | 12,3±1,2 |
| Cu | 161,4 ± 11,3 | 101,4 ±8,4 | 176,4 ± 12,4 | 94,6 ± 7,6 | 181,6±14, 7 | 93,8±7, 1 | 173,4±14 ,4 | 98,2±5,6 |
| Zn | 104,6 ± 8,6 | 516± 38,3 | 108,3 ± 9,1 | 528 ± 41,4 | 114±9,8 | 518±39, 4 | 98,7±7,4 | 532±48, 1 |
| Se | 11,6 ±0,9 | 15,4 ± 0,8 | 10,7 ±0,75 | 15,6 ± 0,9 | 9,8±0,67 | 15,1±1, 3 | 10,3±0,8 | 15,4±1,3 |
| M o | 1,1 ±0,09 | 0,9 ± 0,06 | 1,15 ± 0,1 | 0,8 ± 0,07 | 1,0±0,07 | 1,1±0,0 9 | 0,8±0,5 | 1,12±0,0 9 |
| I | 6,5 ± 0,45 | 19,8 ± 1,2 | 6,6 ± 0,5 | 19,2 ±1,3 | 7,1±0,7 | 20,1±1, 7 | 6,9±0,5 | 18,3±1,1 |
| Ni | 6,4 ± 0,5 | 14,1 ±0,9 | 6,3 ± 0,4 | 14,3 ± 1,1 | 5,6±0,4 | 13,2±0, 9 | 5,9±0,38 | 14,1±0,9 |
| Toxictraceelements | | | | | | | | |
| Be | 0,51±0,0 3 | 0,2±0,1 | 0,56±0, 03 | 0,28±0,0 19 | 0,46±0,03 | 0,3±0,0 2 | 0,58±0,0 3 | 0,21±0,0 2 |
| Al | 256±26, 3 | 259±19,4 | 269±28, 4 | 261±28,5 | 259±31,6 | 219±19, 5 | 281±26,3 | 271±21, 3 |
| Cd | 27,1±1,9 | 28,4±1,6 | 25,6±1, 8 | 27,4±2,1 | 19,3±1,1 | 26,3±1, 9 | 27,1±3,1 | 26,4±1,9 |
| Hg | 0,3±0,02 | 0,26±0,0 16 | 0,28±0, 01 | 0,3±0,02 8 | 0,26±0,01 7 | 0,2±0,0 15 | 0,33±0,0 2 | 0,21±0,0 2 |
| Pb | 33,6±3,1 | 29,1±2,8 | 27,4±2, 4 | 26,3±2,8 | 22,8±1,9 | 25,5±2, 1 | 28,3±2,7 | 24,1±1,9 |

The content of cobalt in the blood of the examined girls after completion of bleeding is; 1-3 days of the approximate cycle in blood serum is 4.8 ± 0.3 μg%, in red blood cells 13.2 ± 0.9 μg%, day 7, respectively. - 4.6 ± 0.28 and 11.4 ± 0.9 μg%, day 14, respectively. - 4.1 ± 0.33 and 11.8 ± 1.1 μg%, 21 days respectively. - 3.8 ± 0.29 and 12.3 ± 1.2 μg%. Consequently, the cobalt level tends to decrease at 14 days both in blood serum and in red blood cells, which progressed on the 21st day of the cycle ($P < 0.05$). In general, cobalt levels were significantly reduced in girls with juvenile uterine bleeding compared with similar indicators for healthy girls ($P < 0.05$)

The level of copper in the blood of girls with UMK is distributed as follows; 1-3 days of the cycle in blood serum is 161.4 ± 11.3 μg%, in red blood cells 101.4 ± 8.4 μg%, day 7, respectively. - 176.4 ± 12.4 and 94.6 ± 7.6 μg%, day 14, respectively. - 181.6 ± 14.7 and 93.8 ± 7.1 mcg%, 21 days respectively. - 173.4 ± 14.4 and 98.2 ± 5.6 μg% ($P < 0.05$). Unlike healthy girls, the concentration of copper in serum tends to increase markedly as the days of the anovulatory cycle increase. At the same time, there is a high negative correlation between copper in blood serum and its content in red blood cells ($r = -0.67$). This position indicates a deficiency of this ME in the body as a whole.

Zinc, the leading place of which is given to fertilization and the onset of ovulation, its concentration in the blood of girls with juvenile uterine bleeding after bleeding is distributed as follows; 1-3 days of the cycle in blood serum is 104.6 ± 8.6 μg%, in red blood cells 516, ± 38.39 μg%, day 7, respectively. - 108.3 ± 9.1 and 528 ± 41.4 mcg%, day 14, respectively. - 114 ± 9.8 and 518 ± 39.4 μg%, 21 days respectively. - 98.7 ± 7.4 and 532 ± 48.1 μg%. So, if in healthy girls the concentration of this ME is characterized by a significant fluctuation precisely during the preliminary days of ovulation, on the contrary, in girls with juvenile uterine bleeding

its level was monotonic throughout the entire anovulatory cycle. Moreover, the zinc concentration was significantly reduced in girls with juvenile uterine bleeding compared with similar indicators of healthy girls both in blood serum and in red blood cells (P <0.05 - 0.01).

The concentration of selenium in the blood of girls with juvenile uterine bleeding after bleeding is distributed as follows; 1-3 days of the cycle, its level in blood serum is 11.6 ± 0.9 μg%, in red blood cells 15.4 ± 0.8 μg%, day 7, respectively. - 10.7 ± 0.75 and 15.6 ± 0.9 μg%, day 14, respectively. - 9.8 ± 0.67 and 15.1 ± 1.3 μg%, 21 days respectively. - 10.3 ± 0.8 and 15.4 ± 1.3 μg%. Moreover, the level of selenium in the blood serum during the observation period is markedly reduced, however, these data were unreliable (P> 0.05).

The blood molybdenum content in girls with juvenile uterine bleeding is; 1-3 days of the cycle, its level in serum is 1.1 ± 0.09 μg%, in red blood cells 0.9 ± 0.06 μg%, day 7, respectively. - 1.15 ± 0.1 and 0.8 ± 0.07 μg%, day 14, respectively. - 1.0 ± 0.07 and 1.1 ± 0.09 μg%, 21 days respectively. - 0.8 ± 0.5 and 1.12 ± 0.09 μg%.

The information on the level of iodine in the blood of girls with UMC is also of considerable interest. So, in 1-3 days of the cycle, the level of iodine in the blood serum is 6.5 ± 0.45 μg%, in red blood cells 19.8 ± 1.2 μg%. Further, on day 7 (respectively - 6.6 ± 0.5 and 19.2 ± 1.3 μg%), 14 - (respectively - 7.1 ± 0.7 and 20.1 ± 1.7 μg %) and 21 days (respectively - 6.9 ± 0.5 and 18.3 ± 1.1 μg%), its concentration is characterized by strict monotony, which directly correlated with the level of estradiol on day 14 of the anovulatory cycle (r = 0.56 ) This position indicates a possible direct or direct participation of iodine in the synthesis of this hormone, respectively, the onset of ovulation.

The concentration of nickel in the blood in girls with juvenile uterine bleeding after bleeding is distributed as follows; 1-3 days of the cycle, its level in blood serum is 6.4 ± 0.5 μg%, in red blood cells 14.1 ± 0.9 μg%, day 7, respectively. - 6.3 ± 0.4 and 14.3 ± 1.1 μg%, day 14, respectively. - 5.6 ± 0.4 and 13.2 ± 0.9 μg%, 21 days respectively. - 5.9 ± 0.38 and 14.1 ± 0.9 μg% (P> 0.05).

The manganese responsible for the development of the genital organs has its own natural fluctuations during the alleged days of the anovulatory cycle in a comparative aspect in healthy girls and those suffering from juvenile uterine bleeding. So, for 1-3 days of a cycle, its level in blood serum is 12.1 ± 0.8 μg%, in red blood cells 23.8 ± 1.4 μg%, day 7, respectively. - 13.7 ± 0.9 and 23.7 ± 1.4 μg%, day 14, respectively. - 14.1 ± 1.3 and 24.3 ± 1.8 μg%, 21 days respectively. - 13.6 ± 0.7 and 23.7 ± 1.8 μg%. Consequently, the serum manganese content is characterized by a gradual increase in its level as the days of the cycle increase. At the same time, the concentration of manganese, in contrast to indicators of healthy girls, was significantly lower in girls of the main group (P <0.05 - 0.001).

The concentration of beryllium in the blood of girls with juvenile uterine bleeding after bleeding is distributed as follows; 1-3 days of the cycle, its level in the blood serum is 0.51 ± 0.03 μg%, in red blood cells 0.2 ± 0.1 μg%, day 7, respectively - 0.56 ± 0.03 and 0.28 ± 0 , 19 μg%, day 14, respectively - 0.46 ± 0.03 and 0.3 ± 0.02 μg%, 21 days, respectively - 0.58 ± 0.03 and 0.21 ± 0.02 μg%.

The concentration of cadmium in the blood in girls with juvenile uterine bleeding after bleeding is distributed as follows; 1-3 days of the cycle, its level in blood serum is 27.1 ± 1.9 μg%, in red blood cells 28.4 ± 1.6 μg%, on day 7, respectively –25.6 ± 1.8 and 27.4 ± 2 , 1 μg%, day 14, respectively - 19.3 ± 1.1 and 26.3 ± 1.9 μg%, day 21, respectively - 27.1 ± 3.1 and 26.4 ± 1.9 μg%.

The concentration of mercury in the blood in girls with juvenile uterine bleeding after bleeding is distributed as follows; 1-3 days of the cycle, its level in blood serum is 0.3 ± 0.02 μg%, in red blood cells 0.26 ± 0.016 μg%, on day 7, respectively - 0.28 ± 0.01 and 0.3 ± 0.028 μg% , 14 days respectively –0.26 ± 0.017 and 0.2 ± 0.015 μg%, 21 days respectively - 0.33 ± 0.02 and 0.21 ± 0.21 μg%.

The blood lead concentration in girls with juvenile uterine bleeding after bleeding is distributed as follows; 1-3 days of the cycle, its level in blood serum is 33.6 ± 3.1 μg%, in red

blood cells 29.1 ± 2.8 μg%, on day 7, respectively - 27.4 ± 2.4 and 26.3 ± 2 , 8 μg%, day 14, respectively - 22.8 ± 1.9 and 25.5 μg%, day 21, respectively - 28.3 ± 2.7 and 24.1 ± 1.9 μg%.

Thus, blood MEs are highly correlated with both clinical and laboratory parameters of juvenile uterine bleeding. The lack of such essential MEs as iodine, iron, selenium, zinc, cobalt have direct correlations with menstrual irregularities. In contrast, girls suffering from JMC show elevated levels of toxic MEs such as beryllium, aluminum, and mercury.

juvenile uterine bleeding is a serious disease that adversely affects girls' reproductive function. Microelementoses directly affecting the homeostasis of the body as a whole, occupy one of the leading places in the development of juvenile uterine bleeding in girls.

## 4. References:

1.Abdullaev M.A. The role of trace elements of the regulation of immunity in the body. Jour. Dermatology and reproductive health news. 2005; No. 1; 99-101C.

2.Амонов И.И., Мавлонова Г.Ш.,Ихтиярова Г.А. Микроэлементозы у подростков и пути коррекции их дефицита// Тиббиётдаянги кун. - 2020. - № 3(31). - С. 257 - 260.

3.Nosolodin V.V., V.L. Shirokov, A.V. Lucine. The interaction of trace elements in the process of their exchange in the body. Jour. Nutrition issues. 1999.№4.

4.Ikhtiyarova G.A.,Shodiev B.V., Ashurova N.G. Effectiveness of microelement support in women with recurrent reproductive losses// Новостидерматовенерологииирепродуктивногоздоровья. - 2019. - №3 - 4. - С. 14 - 17.

5. Mavlyanova N.N., Ixtiyarova G.I., Tosheva I.I., AslonovaM.Zh., Narzullaeva N.S. The State of the Cytokine Status in Pregnant Women with Fetal Growth Retardation// Journal of Medical - Clinical Research & Reviews. ISSN 2639 - 944X. - 2020. - №4(6). - P. 18 - 22.

6. OripovaF.Sh, Ikhtiyarova G. A., KurbanovaZ.Sh. Reproductive rehabilitation of women with chronic inflammatory diseases of the genitals.//Journal of biomedicine and practice special issue 2. - 2020. - P. 56 - 59.

7. Rebrov V.G., Gromova O.A. Vitamins and minerals, M., Alev-V, - 2003, 648 p.

8. Rasulov S.K. Microelementoses in school-age children: clinical and hematological characteristics, diagnostics, treatment and prevention. The author. Diss ... cand. Honey. Science. Tashkent. 2006; 11-12C.

9. Sarkisova L. V., Yuldasheva R. U., Kurbanova Z. Sh., Aslonova M. J., The Role of Indicators of Ferrokinetics and Endogenous Erythropoietin in Anemia of Pregnant Women, *American Journal of Medicine and Medical Sciences*, Vol. 10 No. 4, 2020, pp. 262-265. doi: 10.5923/j.ajmms.20201004.19.

10.Ikhtiyarova G.A., KurbanovaZ.Sh., Rozikova D.K. Reasons and methods for diagnosing endocrine infertility and the role of vitamin D in its correction. A new day in medicine 2 (30/2) 2020 pp34-38

11Ikhtiyarova G.A., KurbanovaZ.Sh., Rozikova D.K. Anovulatory infertility and polycystic ovary syndrome. A new day in medicine 2 (30/2) 2020 pp159-165