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EXPERIENCE OF NON-MEDICAMENTOUS CORRECTION OF CALCIUM-PHOSPHORIC EXCHANGE DISORDER IN A PATIENT WITH COMORBID PATHOLOGY

ABSTRACT

We have used for the first time a non-medicamentous complex method of correction of fish-bone flour and mineral water «Abalakhskaya» with disorder of calcium-phosphorus metabolism in a patient with comorbid pathology.

Objective: to study calcium-phosphorus metabolism in a patient with osteoporosis, pathology of the biliary tract through complex non-drug correction with the use of food fish-bone flour and mineral water «Abalakhskaya».

The clinical study included two times complex application of mineral water «Abalakhskaya» in a volume of 400-600 ml / day and food fish meal 18 g / day daily for 45 days with two 1.5-month breaks. The duration of the course of treatment was 6 months.

After the course of complex reception of food fish-bone flour and mineral water «Abalakhskaya», the patient notes decrease in pain in the lumbar spine, increase in physical activity, decrease in weight by 5 kg, improvement in the condition of nails and hair, and normalization of the stool. According to the patient, overall well-being has improved.

At physical examination of the patient we revealed:

- a decrease in BMI from 36 to 33.8 kg / m², which corresponds to the obesity of grade 1;
- Significant reduction in palpable tenderness of the lumbar region the spine;
- nail plates with a flat surface, pale pink color, fragile.

The patient underwent two stages of the complex non-medicamentous correction well, no side effects were noted.

Keywords: comorbid diseases, non-pharmacological technologies, calcium-phosphorus metabolism, fish-bone flour, mineral water «Abalakhskaya».

INTRODUCTION

The high rate of the population of Yakutia with socially significant diseases of digestive organs, osteoporosis, arterial hypertension dictates the need to develop new rational methods of prevention and treatment, including using biomedical technologies.

The transition to a strategy for the development of health saving technologies, including the rational use of environmentally friendly biological natural resources available on the territory of the Republic of Sakha (Yakutia), will allow the introduction of non-medical technologies of non-drug technologies into the practices of prevention and treatment of diseases.

Objective: to study calcium-phosphorus metabolism in a patient with osteoporosis, pathology of the biliary tract through complex non-drug correction with the use of food fish-bone flour and mineral water «Abalakhskaya».

MATERIALS AND METHODS OF RESEARCH

The research was carried out from March 13, 2017 to August 31, 2017 by the educational and scientific laboratory (UNIL) «Medical technologies in gastroenterology» of the department «Hospital Therapy, Occupational Diseases and Clinical Pharmacology» of the Medical Institute North-Eastern

Federal University named after M.K. Ammosov, the small Innovative enterprise LLC «Dary Yakutia» and LLC «Abalakhskaya medicinal water», the Institution of the Ministry of Health Care of the Republic of Sakha (Yakutia) «Abalakh Republican Center for Medical Rehabilitation». The study was approved at a meeting of the local bioethics committee of «North-Eastern Federal University named after M.K. Ammosov» (Minutes No. 9 of 15 February 2017, Decision No. 1).

Fish-bone flour, rich in macro- and microelements, in particular calcium and phosphorus, omega-3, omega-6 polyunsaturated fatty acids, proteins, fat and water-soluble vitamins, can be used as a means to regulate the of calcium phosphorus homeostasis.

The production of fish-bone flour with the help of the radiation-convective method of drying bones with the remains of fillets on the bones which allows the maximum preservation of useful

substances. For this technology of food fishmeal flour production, patents of the Russian Federation in 2014 and international Eurasian in 2017 have been obtained (Authors: Safonova S.L., Borisov V.E., Borisov E.E.).

Mineral water «Abalakhskaya» is low-mineralized hydrocarbonate sodium water with a slightly alkaline reaction. 4 new patents of the Russian Federation for inventions in 2010 and 2013 (Authors: Safonova SL, Emelyanova EA, Platonova AA) were obtained for new technologies for treating gastroenterological patients using the mineral water «Abalakhskaya».

The clinical study included two times complex application of mineral water «Abalakhskaya» (AMV) in a volume of 400-600 ml / day and food fish meal 18 g / day daily for 45 days with two 1.5-month breaks. The duration of the course of treatment was 6 months (Fig. 1).

The patient was selected on a voluntary basis on the basis of inclusion and exclusion criteria.

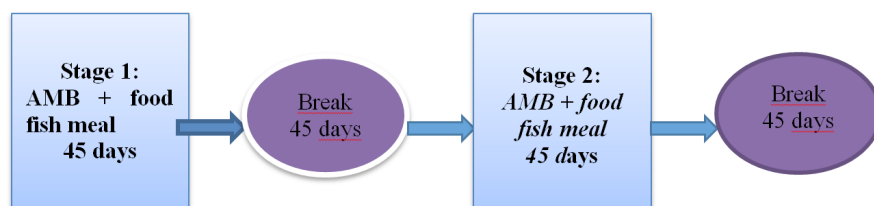


Fig.1. Scheme of complex application of AMB and fish-bone flour

At the stage of research the paraclinical methods of diagnostics are monitored:

1. Indicators of calcium and phosphorus metabolism in the patient's body:

- levels of ionized calcium in blood and urine, phosphorus in the blood, 25 (OH) D (cholecalciferol), alkaline phosphatase, lipid spectrum of blood, protein composition of blood;

- general clinical tests of blood and urine;

- X-ray densitometry was performed on GE Lunar iDXA, in 3 standard projections (lumbar spine, femoral neck, forearm radius). Since there was a fracture of the radius in a typical place of the left forearm, a bone mineral density (BMD) study was carried out on the right forearm. To interpret the results, the densitometric classification of WHO (1994) was used in estimating BMD in postmenopausal women. The results of densitometry were evaluated as: «normal» at a T-test value of +2.5 SD to -0.9 SD from peak bone mass; «Osteopenia» with a value of the T-test from -1.0 SD to -2.4 SD; «Osteoporosis» with a T-test value of -2.5 and less SD. By «severe osteoporosis» was meant the value of the T-test was -2.5 SD and lower with the presence of one or more fractures in the anamnesis.

In order to interpret the results, the WHO densitometric classification (1994) was used in the evaluation of BMD in postmenopausal women, according to which the diagnosis of osteoporosis is carried out on the basis of the T-test: within the norm there are values not exceeding +2.5 SD (standard deviation) and not below -1.0 SD, values from -1.0 SD to -2.5 SD are considered as osteopenia, values below -2.5 SD are classified as osteoporosis and values of -2.5 SD in the presence of at least one fracture of the vertebra or femoral neck, as well as other fractures that do not correspond to severity of trauma - as severe osteoporosis.

Comparison with the norm was carried out in two respects: comparison with the normal peak bone mass (T-test), that is, with an average value for the age at which the BMD in this part of the skeleton reaches a maximum and comparison with the age norm (Z-test) that is, with an average value for a given age. The result of the comparison is represented in SD and in percentage to the corresponding norm.

2. Electrocardiography (ECG) in 12 conventional leads, office measurements of blood pressure;

3. Ultrasound examination (ultrasound) of the abdominal cavity organs;

4. Esophagogastroduodenoscopy (EFGDS)

RESULTS AND DISCUSSION

Patient A., 64 years old, a working pensioner, lives in Yakutsk. Complaints of pain in the lumbar spine when getting prolonged static load, pain while moving in the right shoulder, bitterness in the mouth, bloating, pain in the right upper quadrant, unstable stools when taking fatty, fried foods. The patient is included into the first of dispensary account on chronic acalculous cholecystitis, a focal-atrophic gastritis a specific diet is recommended. According to her words in 2009 she suffered a fracture of the radius in a typical place on the left, in 2010 she underwent 2 operations for a complex fracture of the right shoulder, resulting from a domestic trauma. Treatment with calcium and bisphosphonates was not carried out.

Obstetric and gynecological history: 6 pregnancies, 6 urgent deliveries, physiological menopause at the age of 53 years.

The allergic anamnesis is not burdened.

The condition is satisfactory. Consciousness is clear. Body mass index (BMI) 36 kg / m². Correct physique, hypersthenic constitution, increased nutrition. The gait is not impaired. Bone-joint system: limitation of mobility in the right shoulder joint, postoperative scar. The left forearm without deformity. There is pain in palpation of the lumbar spine, fragility of nail plates. Skin covers and visible mucous membranes are pale pink, moist. Peripheral lymph nodes are not enlarged. Visible edema is not present. Frequency of respiratory movements is 20 per min. Voice tremor is weakened. Percutally clear pulmonary sound. With auscultation, breathing is vesicular, there is no wheezing. The apical impulse is not determined. The border of the heart is not expanded. The heart sounds are weakened, the rhythmic heart rate is 72 per minute, the pulse on the radial artery is symmetrical, the rhythmic 72 per minute. Arterial pressure (BP) 130/80 mm Hg on both hands. The tongue is moist, covered at the root with white coating. The abdomen is enlarged in volume due to subcutaneous fat, symmetrical, participates in the act of breathing. With superficial palpation the abdomen is soft, painless. Symptoms of Murphy, Ortner are negative. The liver and spleen are not enlarged with percussion. The symptom of effleurage is negative. According to the patient, the stool is regular, chaped by, without pathological impurities. Urination is free, painless. Initial laboratory indicators. The general or common analysis of a blood as of 15.03.2017 without a pathology. The general analysis of urine as of March

15, 2017 without pathology.

Biochemical blood test as of March 15, 2017 total cholesterol 6.11 mmol / l, ionized calcium 1.2 mmol / l, phosphorus 1.03 mmol / l, vitamin 25 (OH) D 23 ng / ml.

Initial results of instrumental research.

Ultrasound of the abdominal cavity of 10.03.2017 - signs of chronic acalculous cholecystitis.

EFGDS from 11.03.2017 - functional failure of cardia. Focal-atrophic gastritis in remission.

ECG in 12 conventional leads from 11.03.2017 sinus rhythm 70 in min. The electric axis is horizontal.

X-ray densitometry dated 03/09/2017.

Mineral density of the bone tissue of the lumbar spine in segment L1-L4 (0.984 g / cm²), T-criterion -1.7 SD, 83% of peak bone mass, Z-criterion -1.2 SD corresponds to osteopenia. The bone mineral density in the femoral neck region to the left is (0.785 g / cm²), the T criterion is -1.8 SD, 76% of the peak bone mass, the Z-criterion -1.1 SD corresponds to osteopenia. The mineral density of bone tissue is 33% of the radius of the right forearm (0.546 g / cm²), the T criterion is -3.8 SD, 62% of the peak bone mass, the Z criterion -2.5 SD corresponds to osteoporosis.

The risk of major osteoporotic fractures over the next 10 years under the FRAX program is 28.7%, the risk of hip fracture is 1.7%.

Taking into account the complaints of the patient, the history of the disease, the indicators of clinical-laboratory, instrumental-diagnostic studies, the following diagnosis is made: for the first time revealed postmenopausal osteoporosis, a severe form with a fracture of the radius of the left forearm.

Focal-atrophic gastritis in remission. Chronic calculus-free cholecystitis without exacerbation. Hypercholesterolemia. Obesity of the II degree.

In order to correct the violation of calcium-phosphorus metabolism, the patient is assigned the following:

1. A complex of rehabilitation measures with the implementation of an educational school for the correction of excess weight, a program of physical activation.

2. Table 5 on Pevzner;

3. Fish-bone flour for 9 g 2 times a day during lunch and dinner for 45 days;

4. Mineral water «Abalakhskaya» t 42 ° C to 200 ml 3 times a day for 1- 1.5 hours before meals for 45 days. Intake of water in large sips is recommended.

After the course of complex reception of food fish-bone flour and mineral water «Abalakhskaya», the patient notes decrease in pain in the lumbar spine,



Fig. 2. Dynamics of levels of vitamin 25 (OH) D and total cholesterol in patient A., 64 yrs.

increase in physical activity, decrease in weight by 5 kg, improvement in the condition of nails and hair, and normalization of the stool. According to the patient, overall well-being has improved.

At physical examination of the patient the following is noted:

- a decrease in BMI from 36 to 33.8 kg / m², which corresponds to the obesity of grade 1;

- Significant reduction in palpable tenderness of the lumbar region the spine;

- nail plates with a flat surface, pale pink color, fragile. The patient transferred two stages of the complex non-medicamentous correction well, no side effects were noted.

In biochemical analysis, the following is recorded: - normalization of the total cholesterol level from 6.1 to 5.0 mmol / l (Fig. 2); - restoration to an adequate level of vitamin 25 (OH) D from 23 to 31 ng / ml (Fig. 2); - the concentration of ionized calcium and phosphorus in the blood serum within the limits of normal values (Fig. 3).

Daily urinary calcium excretion is within normal reference values, but after the 2-nd stage of the complex reception of fish- bone flour and mineral water «Abalakhskaya» with a daily diuresis of 2500 ml, the calcium level is reduced to 1.30 mmol/ day, which can be explained by improvement in metabolism between the bone tissue and blood with mobilization of calcium and phosphorus (Fig. 4).

X-ray densitometry dated 18.09.2017

The mineral density of the lumbar spine bone in segment L1-L4 (1.018 g / cm²), T-criterion -1.4 SD, 85% of peak bone mass, Z-criterion -0.9 SD corresponds to osteopenia. The bone mineral density in the femoral neck region on the left (0.816

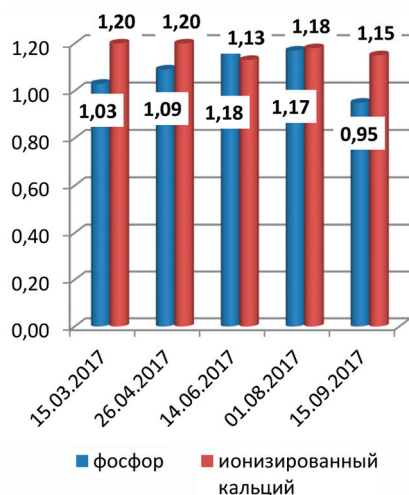


Fig. 3. Dynamics of the level of ionized calcium and phosphorus in the blood in patient A., 64 yrs.

g / cm²), the T criterion -1.6 SD, 79% of the peak bone mass, the Z criterion -0.8 SD corresponds to osteopenia. The mineral density of the bone tissue, 33% of the radius of the right arm of the right arm is (0.547 g / cm²), the T criterion is -3.8 SD, 62% of the peak bone mass, the Z-criterion -2.4 SD corresponds to osteoporosis.

The risk of major osteoporotic fractures over the next 10 years under the FRAX program is 26.4%, the risk of fracture of the femoral neck is 1.4%.

The conclusion. Based on the results of X-ray densitometry after six months of observation, the bone mineral density in the segment L1-L4 was increased by 0.034 g/cm and the neck of the left femur was 0.031 g/cm (Fig. 5), the positive dynamics in the mineralization of the radius of the right forearm was observed.

Also there was a decrease in the risk of 10-year probability of fractures against the background of osteoporosis.

The incremental mineralization of bone tissue in the axial skeleton is due to the fact that initially at the time of the initial examination in these segments, BMD corresponded to osteopenia. In the peripheral skeleton with pronounced signs of osteoporosis, there is no significant increase in mineralization of bone tissue. Thus, observing the increment of mineralization of bone tissue of the axial skeleton against the background of complex application of fish-bone flour and mineral water «Abalakhskaya», in patient A., 64 yrs., it is recommended to continue treatment with the addition of

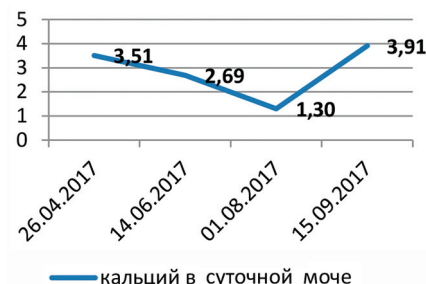


Fig. 4. Dynamics of daily excretion of calcium in urine in patient A., 64 yrs.

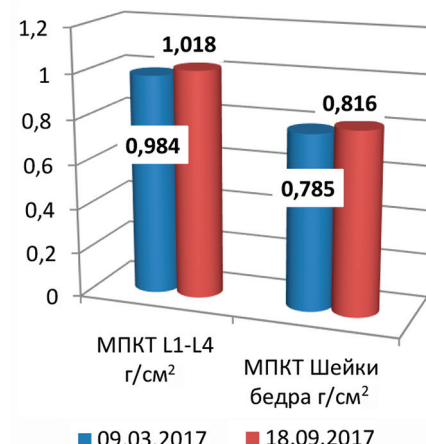


Fig.5. Dynamics of growth of BMD in the axial skeleton in patient A., 64 yrs.

pathogenetic therapy.

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