Among men there is an unstable trend towards a decrease the incidence of mental disorders (R2=0,652) while among women there is no trend at all (R2 = 0,005).

The total number of patients with mental disorders registered at the organizations of the Ministry of Health of the Republic of Belarus in 2010–2017 is growing (R2 = 0,9). There is also a steady upward trend of the total number of patients with psychoses (R2 = 0,987) and mental retardation (R2 = 0,897) for the studied period of time. The total number of patients with schizophrenia gradually reduces (R2 = 0,889), and the number of patients with non-psychotic mental disorders remains at a relatively constant level (R2 = 0,345). There is a steady increase of the total number of patients under advisory supervision (R2 = 0,877).

Obviously, the situation in the Republic of Belarus requires constant monitoring. It is necessary to continue studying the various epidemiological aspects of the incidence and the prevalence of mental disorders in order to develop and introduce new more effective methods of prevention, diagnostics and treatment. This will work as a basis for strengthening the mental health of the population [2].

BIBLIOGRAPHY

1. *Herasimov, A.* Medical statistics / A. Herasimov. – Minsk: MIA, 2007. – 480 p.
2. *Herbert, J.* Cracking the skull open / J. Herbert. – Oxford: University Press, 2015.
3. *Wittchen, H. U.* The size and burden of mental disorders and other disorders of the brain in Europe 2010 / H. U. Wittchen [et al]. – Elsevier: European Neuropsychopharmacology, 2011.

THE RESEARCH OF THE MICROELEMENT DISTURBANCE IN OSTEOARTHRITIS

N. Bashura[1], V. Koktysh[2]

[1]Belarusian State University, ISEI BSU,
Minsk, Republic of Belarus
[2]11th clinical hospital,
Minsk, Republic of Belarus
anstashion1998@gmail.com

An imbalance in the body of the levels of individual trace elements is considered as one of the important clinical and pathogenetic components of degenerative inflammatory diseases of the joints. Trace elements play the role of cofactors involved in the processes of articular inflammation. A decrease in the concentration of trace elements such as calcium, iron, copper and zinc in patients with osteoarthritis has been established. The results can be used to assess the level of trace elements in patients with musculoskeletal pathology and correct their nutrition.

Keywords: osteoarthritis, gonarthrosis, coxarthrosis, hair, X-ray fluorescence analysis, microelements.

Osteoarthritis is considered to be a multifactorial disease, in which all joint structures are involved in the pathological process. Every year, in the Republic of Belarus there is an increase in the incidence of degenerative joint diseases and occurs in every third person after 45 years. Osteoarthritis significantly affects the quality of life of patients and is one of the main causes of temporary and permanent disability.

Microelementosis - an imbalance in the body of the level of trace elements - is considered as an important factor in the development of degenerative diseases of the joints. Trace elements are components of many enzyme systems and are part of enzymes and coenzymes and affect the functioning of cell composition and joint homeostasis.

The chemical composition of hair is better than the rest of biological media reflects the effect on humans of both elevated concentrations of chemical elements and the provision of physiological needs in them. Hair is able to accumulate in itself all those chemical compounds that are present in the body or in the environment. Analysis of the mineral composition of hair is an analytical test that is widely used in the diagnosis of pathological conditions.

The aim of the research was to study microelement disturbances in gonarthrosis and coxarthrosis and to evaluate the clinical significance of microelementosis in the development of osteoarthritis.

The study material was hair with the informed consent of 24 patients, treated in the 11th City Clinical Hospital, as well as the hair of 8 donors who served as a control group. To study the microelement composition of hair, the method of x-ray fluorescence analysis was used. The reference interval for the calcium (Ca) content in adult hair is 300–1000 μg/g; zinc (Zn) – 120–200 μg/g; copper (Cu) – 9–30 μg/g; iron (Fe) – 15–35 μg/g. Statistical processing of the obtained data was performed using nonparametric methods in "STATISTICA 8" software.

A decrease in the concentration of Ca ($p = 0,0009$), Cu ($p = 0,004$), Zn ($p = 0,0002$) in patients with coxarthrosis was found. Patients with gonarthrosis showed a statistically significant decrease in Zn concentration ($p = 0.004$) when compared with the reference interval.

It was not possible to identify statistically significant differences in the concentration of Zn, Ca and Fe when was comparing the results of the content of trace elements in the hair in patients with coxarthrosis and gonarthrosis. Although it showed an increase in Cu (p = 0,048) in patients with coxarthrosis compared with gonarthrosis.

A statistically significant inverse correlation was found between the index of body mass index and concentration Zn (Rs = –0.89, p = 0,0005) in coxarthrosis. It was found that the higher the body mass index, the lower the concentration of Zn in the hair during coxarthrosis, which may indicate obesity, increased load on the joints, and, consequently, the appearance and progression of joint diseases.

The results can be used to assess the level of trace elements in patients with musculoskeletal pathology and correct their nutrition.

BIBLIOGRAPHY

1. *Синяченко, О. В.* Клинико-патогенетическая значимость остеоассоциированных микроэлементов при болезнях суставов. Сообщение II. Микроэлементоз в волосах / О. В. Синяченко [и др.] // Боль. Суставы. Позвоночник. – 2016. – Т. 3, №. 23. – С. 67–73.

2. *Roczniak W.* The content of structural and trace elements in the knee joint tissues / W. Roczniak [et al.] // Int J. Environ Res Public Health. – 2017. – Vol. 14, № 12. DOI: 10.3390/ijerph14121441.

3. *Roczniak, W.* Factors that affect the content of cadmium, nickel, copper and zinc in tissues of the knee joint / W. Roczniak [et al.] // Biol. Trace Elem. Res. – 2017. – Vol. 178, № 2. P. 201–209.

ANTIOXIDANT ACTIVITY OF THE EXTRACTS OF CHESTNUT FLOWERS (*AESCULUS HIPPOCASTANUM* L), ROWAN (*SORBUS AUCUPARIA* L.), ACACIA (*ACACIA*) AND DIFFERENT TYPES OF LILAC (*SYRINGA*)

D. Baskina[1], E. Tarun[1], D. Shkurko[1], P. Kurchenko[2]

[1]Belarusian State University, ISEI BSU,
Minsk, Republic of Belarus
[2]Belarusian State University,
Minsk, Republic of Belarus
darina.baskina@icloud.com

The comparative study of the antioxidant activity of extracts of acacia, rowan, chestnut and different types of lilac flowers has been conducted. The dependence of the fluorescence intensity of fluorescein from the logarithm of the concentration of extracts of flowers was obtained, where the indicators IC50 were determined graphically. Extracts of flowers of acacia, rowan and chestnut restored fluorescence of fluorescein to 98-100% at a concentration of samples of 10-3-10-2%. Extracts of lilac flowers restored the fluorescence of fluorescein to 86-95% at a concentration of samples of 10-1-1%. The IC50 of extracts of flowers of acacia, rowan and chestnut were within 2÷5,3·10-5%, extracts of flowers of lilac - within 1,26÷7,31·10-4%. The maximum antioxidant activity for acacia extract is determined.

Keywords: antioxidant activity, extracts of flowers of acacia, rowan, chestnut and different types of lilac, fluorescein.

Excessive concentration of free radicals in the body is a central risk factor for cardiovascular, cancer and other pathologies. Flavonoids have strong antioxidant properties and can be used to prevent various diseases. Biologically active substances that are a part of the flowers of acacia, chestnut, Rowan and lilac, determine their pharmacological properties, which allows them to be used as a raw source for the pharmacological industry. The flowers of acacia white contain glycoside robinin, as well as a number of other flavonoids [1].

A comparative study of antioxidant activity (AOA) of extracts of acacia flowers, mountain ash, chestnut and 6 different species of lilac was carried out. The method for determining AOA with respect to activated oxygen species (ROS) is based on measuring the fluorescence intensity of the oxidized compound and its decrease under the influence of ROS.

Extract of flowers of mountain ash starts to show the antioxidant activity at a concentration of 10^{-9} %. Chestnut flower extract begins to exhibit AOA at a concentration of 10-9%. Acacia flower extract begins to exhibit AOA at a concentration of 10^{-9} %. Lilac flower extract begins to exhibit AOA at a concentration of 10^{-6} %. Lilac flower extract dark lilac begins to show AOA at a concentration of 10-7%. White lilac flower extract begins to exhibit AOA at a concentration of 10^{-7} %.

Maximum AOA is obtained for the extract of dark lilac lilac flowers. Suppression of free radicals up to 95 % is achieved at the lowest concentration of 10^{-2}%. Extracts of lilac flowers showed lower AOA compared to ex-