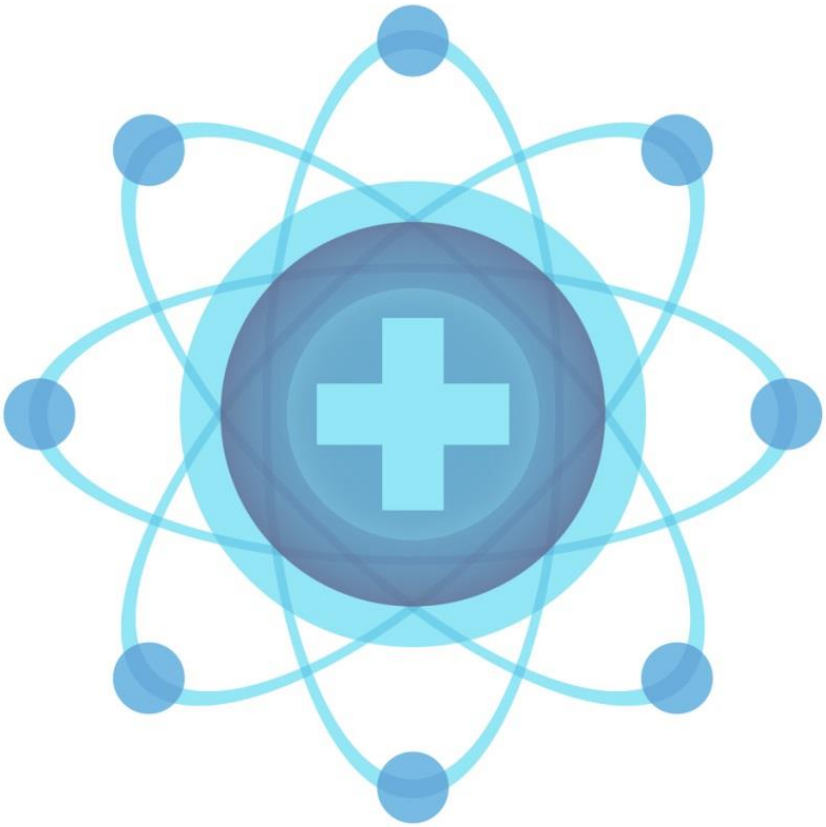

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FEATURES OF CHANGE OF MICROELEMENTAL COMPOSITION IN ANEMIA OF CHRONIC DISEASES IN ELDERLY AND OLD AGE

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ABSTRACT. The purpose of this study is to carry out a comparative analysis of hematopoietic trace elements - iron, copper and zinc - in apparently healthy elderly men and women, depending on the age range. For these purposes, all surveyed men and women living both in urban and rural conditions were divided into two age ranges - surveyed - up to and over 70 years. The results of the analysis showed that there is no statistically significant difference between the indicators of blood hemoglobin and hematopoietic microelements - iron, copper and zinc in the whole group of examined elderly men and the group of examined elderly men and examined elderly women in old age.

KEYWORDS: hematopoiesis, trace elements, blood serum, hemoglobin, age range.

INTRODUCTION. It is known that anemia of chronic diseases (ACD) is the most common anemia worldwide, which ranks second after iron deficiency anemia (IDA). ACD accompanies infectious, rheumatic diseases, neoplasms, as well as chronic heart failure, chronic kidney disease, diabetes mellitus, liver cirrhosis and other nosological units [1, 2, 3, 4].

It was found that the presence of anemia leads to a decrease in the oxygenation of organs and tissues, a decrease in physical activity, the appearance of weakness in the body and a deterioration in the quality of life. In contrast to IDA, in which the diagnosis is not difficult, ACD is often

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not diagnosed, since at the wound stages it proceeds as normocytic and normochromic [5, 6, 10, 11].

Chronic diseases and anemia are independent factors of an unfavorable prognosis of the course of the disease in elderly and senile patients in relation to patients of a younger age [7, 8, 9].

Numerous studies of domestic and foreign scientists have studied AChD from the point of view of the etiopathogenesis of the disease. It has been established that with this pathology, the exchange of trace elements, primarily iron, is disturbed. In this regard, in the diagnosis of ACD, it is important to determine the transferrin and ferritin in the blood serum for the completeness of early diagnosis. But so far, the features of changes in essential trace elements in this category of persons with early diagnosis of ACD have not been fully studied.

In this regard, the purpose of this part of the dissertation work was to determine and assess the indicators of ferrokinetics, as well as essential trace elements in elderly and senile people with IDA, ACD in a comparative aspect.

MATERIALS AND METHODS

For this, the results of studies of elderly (n = 325) and senile (n = 65) persons with IDA, ACD and their combinations were analyzed.

Analysis of the research results shows that the combined form of IDA and ACD occurs most often in both study groups.

RESULTS AND DISCUSSION.

Studies have found that in elderly people the number of patients with IDA and ACD did not significantly differ among themselves, amounting to 23.08 + 2.13% (n = 90) and 27.18 + 2.25% (n = 106), respectively - $P > 0.05$. As for IDA + ACD, the percentage of patients with a combination of these two ailments was significantly higher in relation to IDA and ACD

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taken separately - 1.43 times, respectively, in relation to IDA (respectively 33.08 + 2.38% (n = 129) versus 23.08 + 2.13% (n = 90) - P <0.05), as well as 1.22 times in relation to ACD (respectively 33.08 + 2.38% (n = 129) versus 27 , 18 + 2.25% (n = 106) - P <0.05).

Almost the same picture was observed in the parameters of elderly people, with the only difference that the parameters of IDA and ACD also differed in reliability, respectively 2.56 + 0.80% (n = 10) versus 5.64 + 1.17% (n = 22) - P <0.05. The combined incidence of these pathologies was most noticeably increased, as IDA + ACD were 3.30 times increased in relation to persons of old age with IDA (8.46 + 1.41%, n = 33 versus 2.56 + 0.80% , n = 10) - P <0.001. The same trend was observed when comparing the data of ACD and IDA + ACD, where the difference was 1.50 times (8.46 + 1.41%, n = 33 versus 5.64 + 1.17%, n = 22) - P <0.001.

It should be emphasized that the number of elderly patients with a combined occurrence of IDA + ACD was higher than IDA and ACD, instead of 8.46% (n = 33) versus 8.2% (n = 32).

Thus, the analysis of the parameters of the occurrence of various forms of anemia in elderly and senile people shows that in elderly people there is a significant difference between the indicators of the combined occurrence of IDA + ACD in relation to IDA (1.43 times, P <0.05) and to ACD (1.22 times, P <0.05). However, no significant differences were observed between the parameters of ACD and IDA. This indicates that ACD occurs quite often in elderly people, not yielding to the detection of IDA in this age group of patients, a significantly increased state of the combined occurrence of IDA and ACD (IDA + ACD) in these individuals indicates a peculiarity of the course of these diseases and allows more closely attention when diagnosing the above conditions.

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This tendency persisted in elderly people, with the following differences: firstly, the indicators of IDA and ACD significantly differed among themselves, the increase was in favor of ACD; secondly, the combined occurrence of IDA and ACD was sharply increased in relation to individual IDA and ACD (3.30 and 1.50 times, respectively, $P < 0.001$); thirdly, the number of patients with the combined occurrence of IDA and ACD was greater than that of IDA and ACD instead of those taken. These facts should also be taken into account when planning diagnostic and treatment-and-prophylactic measures in relation to elderly people.

In addition, there was an interesting comparative characteristic of the occurrence of these pathologies within a separate group of elderly and senile people. The results obtained show that IDA is less than 1/3 of patients in this age category - 27.69%. ACD makes up 32.60% of the total number of sick elderly people, most of it was the combined occurrence of IDA and ACD, which reached 39.69%. The data for the elderly were somewhat different - respectively, IDA - 15.38%, ACD - 33.85 and IDA + ACD - 50.77%.

The true incidence of anemia in elderly and senile people differs from each other, which requires close attention when planning therapeutic and prophylactic measures for treatment and prevention of complications of this pathology.

It should be emphasized that the following pathologies appeared with ACD: coronary heart disease (CHD), chronic heart failure (CHF), arthritis of various etiologies, hepatitis of various etiologies, chronic kidney disease (CKD), chronic inflammatory diseases of the gastrointestinal tract (GIT).

The most common among patients with coronary artery disease, CHF and arthritis of various etiology (more than 60.0%).

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The next stage of the research was to study the parameters of the hemogram in elderly and senile people with IDA, ACD and IDA + ACD.

The results obtained show that the parameters of the hemogram in elderly and senile people practically did not differ among themselves, the difference between the obtained average figures was insignificant and not reliable, and therefore we did not consider it appropriate to provide a comparative analysis of the hemogram in this dissertation work.

The obtained results show that in patients with IDA, the blood hemoglobin content was significantly reduced in relation to the reference values - to 76.8 + 7.3x1012 / l ($P < 0.001$). In addition, the same parameters were significantly reduced in relation to the selected standard in patients with ACD (on average, up to 94.6 + 8.4x1012 / l, $P < 0.001$) and with ACD + IDA (on average, up to 82.1 + 6.8x1012 / l, $P < 0.001$).

Comparative analysis between the study groups shows that there is a significant difference between the hemoglobin data in patients with IDA and ACD, which is 1.23 times more in favor of ACD.

A slight increase was also noted in patients with IDA + ACD, but the results between them were not reliable ($P > 0.05$).

The number of erythrocytes was slightly increased in patients with IDA in relation to the compared groups, but if in patients with ACD the decrease in the number of erythrocytes was not significant ($P < 0.05$), then with the combined occurrence of IDA and ACD, the decrease in relation to data with IDA was significant ($P < 0.05$). The mean erythrocyte volume (MCV) also differed in the compared groups, the indicators of patients with ACD were significantly ($P < 0.05$), and IDA + ACD were not significantly ($P > 0.05$) increased in relation to the data of patients with IDA.

The average amount of hemoglobin in the erythrocyte (MCH) and the average concentration of hemoglobin in the erythrocyte (MCHS) in

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patients with ACD and IDA + ACD were significantly higher than the parameters of patients with IDA, which has a certain diagnostic value.

The level of erythrocyte anisocytosis (RDW) was significantly increased in patients with IDA in relation to the data of patients with ACD and IDA + ACD ((P <0.05).

It should be emphasized that in elderly and senile people with IDA, of the 6 studied parameters, all (100%) were lower than the reference values, while in ACD only 2m out of 6 parameters (33.3%) significantly differed from the reference values. The counts showed. That in patients with IDA + ACD, the differences from the reference values concerned 5 parameters out of 6 (83.3%). This fact indicates that not only IDA, but also its combination with ACD will lead to an imbalance of hematological parameters concerning hemoglobin, its content, concentration, volume in erythrocytes.

Thus, the study of comparative hemogram parameters in elderly and senile patients of patients with different forms of anemia, indicators that all parameters in relation to the reference values (100%) were reduced in patients with IDA in patients with ACD, this indicator was 33.3%, and in those surveyed with IDA + ACD was 83.3%. Significant differences between the comparison groups indicate the effect of ACD on hematological parameters in the surveyed. Significant differences between the compared parameters in patients with different forms of anemia indicate a different approach in planning treatment and prophylactic measures for elderly and senile patients.

The next stage of the research was a comparative study of ferrokinetic indices and some parameters of the inflammatory process in elderly and senile people with different forms of anemia (IDA, ACD, IDA + ACD).

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Studies have established that serum iron is one of the main indicators of ferrokinetics, and therefore its determination is mandatory in research work.

We found that the content of serum iron in elderly and senile persons differed from each other depending on the pathological process associated with anemia. So, if in those examined with IDA, the serum iron content averaged 7.7 + 0.74, then in individuals with ACD this parameter increased 2.2 times (on average, up to 16.5 + 1.06. P <0, 05). Not such a significant, insignificant increase in relation to the data of patients with IDA was also distinguished in patients with IDA + AChD (on average, up to 10.4 + 0.86, P <0.05).

Sharp differences between the indicators were distinguished in the determination of ferritin in the blood serum of patients. It was found that in elderly and senile patients with IDA, ferritin was determined on average in the amount of 12.6 + 1.2 μg / l, which is 19.62 times and 9.02 times, respectively, less than the data of patients with ACD and IDA + ACD (respectively 213.2 + 2.5 μg / l and 113.7 + 2.4 μg / l. These data turned out to be increased reference values of this indicator. Huge differences between the studied parameters indicate a somewhat deep pathological process that involves ferritin and leads to a large imbalance between indicators.

The opposite picture was observed when studying the results of a study to determine transferrin in the blood serum of the examined. The parameters of patients with IDA and IDA + AHZ were significantly reduced by 4.0 and 1.79 times in relation to the data of patients with IDA - 1.3 + 0.11 g / l, respectively; 2.9 + 0.24 g / l versus 5.2 + 0.49 g / l (P <0.001).

Noteworthy is the fact that in all cases CST (the ratio of serum iron to transferrin), which in all studied groups was below the reference values

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(P <0.05). The lowest indices for CST were in patients with IDA (1.48 + 0.4%) and IDA + ACD (3.6 + 0.9%).

There is an increase in one of the main diagnostic markers of the inflammatory process, C-reactive protein (CRP) in patients with ACD and IDA + ACP in relation to the indicators of IDA. Such a 4.91 - short and 4.24 - short increase in CRP in relation to the compared group (IDA) indicates the development of the inflammatory process in patients.

Thus, the study and analysis of comparative indicators of ferrokinetics and some parameters of inflammation in elderly and senile people with IDA and AChD indicators are the following features; firstly, the parameters of serum iron in patients with ACD and IDA + ACD were significantly increased in relation to patients with IDA; secondly, the content of ferritin and transferrin in blood serum changed in different directions in patients also in relation to patients with IDA; thirdly, CST was significantly reduced in all study groups, especially this one concerned elderly and senile patients with IDA and IDA + ACD; fourthly, the marker of inflammation - CRP was significantly increased in patients with chronic diseases (ACD and IDA + ACD) in relation to patients with IDA without signs of inflammation; fifth, the CRP content directly, closely positively correlates with the concentration of serum iron, serum ferritin, and also has a negative strong, close relationship with the content of transferrin and TIBC.

Studies have shown that in the pathogenesis of chronic inflammatory diseases, an important place is occupied by the deficiency of trace elements, especially essential trace elements - iron, zinc and copper.

CONCLUSIONS

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Based on the above, at the next stage of the research, the content of essential trace elements in the blood serum of elderly and senile patients was determined.

The obtained results show that no significant differences were observed in the iron content in elderly and senile people - respectively 12.9 + 0.7 in elderly people and 13.4 + 0.7 in elderly people (P> 0.05) ... Almost the same picture is observed in the content of zinc in the blood serum (respectively 6.7 + 0.5 in the elderly and 5.5 + 0.7 in the elderly, P> 0.05), although a slight increase differs in individuals old age in relation to the data of elderly people. In terms of the content of copper in the blood serum, the opposite picture is observed, that is, a significant increase differs in elderly people - respectively, on average, 13.2 + 0.6 in elderly people versus 11.7 + 0.7 in elderly people, P> 0 , 05).

Thus, the study of the content of essential trace elements (iron, zinc and copper) in the blood serum of elderly and senile patients with ACD showed that the tendency of a comparative increase was distinguished in the elderly in iron and copper, the opposite tendency was observed in the content of zinc. This pattern of change is typical for elderly and senile patients with ACD.

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