

# Characteristics Of Exchange Of Essential Microelements Of Copper And Zinc In Healthy Fertilized Women And Women With Combined Copper And Zinc Deficiency State.

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**Abstract:** *The study of various aspects of the problem of common hypomicroelementosis caused by a deficiency of essential trace elements copper and zinc, in particular among women of fertile age, in the population is extremely relevant and important, taking into account the social significance and importance of this population for society, because of what the condition will be health in a given population depends on the state of such important socially significant processes as the healthy development of future generations.*

**Keywords:** *chronic kidney disease, hypomicroelementosis, women of fertile age, serum, microalbuminuria.*

## 1. INTRODUCTION

In recent years, many issues of a large and significant problem of microelementosis have been resolved in conjunction with certain factors of the so-called biogeochemical provinces, which differ in the degree of severity of the impact on the human body environmental, anthropogenic climate about - geographic and other factors [1, 2, 3]. The influence of such biogeochemical provinces on certain aspects of microelement metabolism in the body of women of fertile age has been little studied in medical microelementology [4,5,6,7,8].

Based on the foregoing, the purpose of this study was to conduct a comparative study of the exchange of essential trace elements - copper and zinc in healthy women of fertile age and women with a verified diagnosis of combined copper - and zinc deficiency hypomicroelementosis, permanently residing in the biogeochemical region of the Bukhara region of the Republic of Uzbekistan.

## 2. MATERIALS AND METHODS

In order to characterize the metabolism of copper and zinc in the body of healthy women of fertile age, 39 women aged 18 to 47 years, permanently residing in the city of Kagan, Bukhara region, as well as 32 women aged 19 to 45 years with a combined copper and zinc deficiency state were examined. The content of copper in blood serum was analyzed by the bathocuprein method, zinc using a color reagent for zinc - 5 - Br - PAPS. Derivatives were analyzed indicators - copper - and zinc binding capacitance serum, showing the maximum amount of these trace elements which can bind different agents serum.

### 3. RESULTS AND DISCUSSION

The results obtained on the exchange of copper and zinc in healthy women of fertile age are presented by us in Table 1.

As can be seen from the presented table, the surveyed healthy urban WFA have their own characteristics.

On average, the level of the essential trace element copper in the examined WFA was  $16.1 \pm 0.32 \mu\text{mol} / \text{L}$  with the reference range of this indicator from  $12.4 \mu\text{mol} / \text{L}$  ( min ) to  $20.3 \mu\text{mol} / \text{L}$  ( max ).

On average, the level of the essential trace element zinc in the blood serum of the examined WFA was  $20.3 \pm 0.26 \mu\text{mol} / \text{L}$  with the reference range of this trace element from  $16.1 \mu\text{mol} / \text{L}$  ( min ) to  $24.7 \mu\text{mol} / \text{L}$  ( max ). Thus, the content of zinc in the blood serum exceeds the content of copper by 1.3 times and is statistically significant (  $p < 0.001$  ).

The average level of certain serum iron in the examined WFA was  $19.3 \pm 0.64 \mu\text{mol} / \text{L}$ , with a reference range of this indicator from  $14.1 \mu\text{mol} / \text{L}$  ( min ) to  $27.4 \mu\text{mol} / \text{L}$  ( max ).

The characteristic cooperative relationships between the essential microelements identified by us in the examined WFA were revealed, manifested in the fact that the level of serum copper and the level of serum zinc prevails over the content of both iron and copper in the blood serum.

In addition, we also studied new informative indicators characterizing the state of metabolism of essential trace elements copper and zinc - copper - and zinc- binding capacity of blood serum, i.e. indicators reflecting the maximum binding capacity of various components of blood serum - proteins, lipids, low molecular weight compounds when the blood serum is saturated with these microelements, for example, when patients with copper - and zinc-deficient states are taken corresponding drugs containing microelements - copper and iron.

The average indexcopper binding capacity in serum examined contact urban ZHFV was  $28.3 \pm 0.22 \text{ mmol} / \text{l}$  at referential range of this index from  $25.5 \text{ micromoles} / \text{L}$  ( min ) to  $31.1 \text{ pmol} / \text{l}$  ( max ).

Table 1.

Examined WFA	Statistical indicator	With u $\mu\text{mol} / \text{l}$	Zn $\mu\text{mol} / \text{l}$	Fe $\mu\text{mol} / \text{l}$	Cu - binding capacity blood serum $\text{pmol} / \text{l}$	Zn - binding capacity blood serum $\text{pmol} / \text{l}$
n=39	Min	12.4	16.1	14.1	25.5	28.6
	Max	20.1	24.7	27.4	31.1	34.3
	M $\pm$ m	$16.1 \pm 0.32$	$20.3 \pm 0.26$	$19.3 \pm 0.64$	$28.3 \pm 0.22$	$33.0 \pm 0.24$

Table 2.

Examined ZhFV with combined hypomicro - elementosis	Statistical indicator	With u $\mu\text{mol} / \text{l}$	Zn $\mu\text{mol} / \text{l}$	Fe $\mu\text{mol} / \text{l}$	Cu - binding capacity blood serum $\text{pmol} / \text{l}$	Zn - binding capacity blood serum $\text{pmol} / \text{l}$
n=32	Min	7.8	10.3	8.1	9.7	10.7
	Max	13.1	15.3	11.9	14.8	14.0

	M $\pm$ m	10.3 $\pm$ 0.26	13.2 $\pm$ 0.22	11.5 $\pm$ 0.16	12.8 $\pm$ 0.1 2	17.6 $\pm$ 0 10
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On average, the index of the zinc - binding capacity of blood serum in the examined WFA was  $33.0 \pm 0.24 \mu\text{mol} / \text{L}$  with the reference range of this indicator from  $28.6 \mu\text{mol} / \text{L}$  ( min ) to  $34.3 \mu\text{mol} / \text{L}$  ( max ).

From the presented data, it can be seen that the indicator of the maximum binding capacity of blood serum for copper ions in the examined WFA is  $12.2 \mu\text{mol} / \text{L}$  higher than the average level of the serum copper indicator, which indicates that the examined blood serum has a peculiar buffer capacity for this trace element, which can be used when these sera are saturated with an additional amount of copper, which occurs when medicated copper enters the bloodstream . The indicator of the maximum binding capacity for another essential trace element zinc also exceeds the average level of serum zinc in the surveyed by  $12.7 \mu\text{mol} / \text{L}$ , which indicates the reserve capacity of blood serum for this trace element.

Table 2 presents the results on the exchange of copper and zinc in women of fertile age with a combined copper - and zinc deficiency state.

As can be seen from the presented table, the indices of essential hematopoietic microelements in WFA with combined hypomicroelementosis have their own characteristics.

So, on average, the level of the essential trace element copper in the surveyed urban WFA with combined hypomicroelementosis was only  $10.3 \pm 0.26 \mu\text{mol} / \text{L}$  with a reference range of this indicator from  $7.8 \mu\text{mol} / \text{L}$  ( min ) to  $13.1 \mu\text{mol} / \text{L}$  ( max ).

On average, the level of the essential trace element zinc in the blood serum of the examined urban WFA with combined hypomicroelementosis was  $13.2 \pm 0.22 \mu\text{mol} / \text{L}$  with a reference range of this indicator from  $10.3 \mu\text{mol} / \text{L}$  ( min ) to  $15.3 \mu\text{mol} / \text{L}$  ( max ).

The average level of serum iron in the examined WFA was  $11.5 \pm 0.16 \mu\text{mol} / \text{L}$ , with the reference range of this indicator from  $8.1 \mu\text{mol} / \text{L}$  ( min ) to  $11.9 \mu\text{mol} / \text{L}$  ( max ).

Thus, the pronounced deficiency of essential hematopoietic microelements - copper and zinc - also causes a pathological deficiency of the main hematopoietic trace element - iron, which indicates their synergism in microelement metabolism. In the examined WFAs with combined hypomicroelementosis , as can be seen from the presented table, the phenomenon of the prevalence of zinc levels over iron and copper and iron over copper remains.

In the examined WFAs with combined hypomicroelementosis, we studied new informative indicators characterizing the state of exchange of essential trace elements copper and zinc - copper - and zinc- binding capacity of blood serum, i.e. indicators reflecting the maximum binding capacity of various components of blood serum, - spruce trees, lipids, low molecular weight compounds of blood serum.

On average, the indicator of the copper - binding capacity of blood serum in the examined WFA was  $12.8 \pm 0.12 \mu\text{mol} / \text{L}$  with the reference range of this indicator from  $9.7 \mu\text{mol} / \text{L}$  ( min ) to  $14.8 \mu\text{mol} / \text{L}$  ( max ).

On average, the index of the zinc - binding capacity of blood serum in the examined WFA was  $17.6 \pm 0.10 \mu\text{mol} / \text{L}$  with the reference range of this indicator from  $10.7 \mu\text{mol} / \text{L}$  ( min ) to  $14.0 \mu\text{mol} / \text{L}$  ( max ).

From the presented data, it can be seen that the indicator of the maximum binding capacity of blood serum for copper and zinc ions in the examined WFA decreases, which apparently occurs due to a decrease in the level of protein and other binding agents in the blood serum against the background of the development of hypomicroelementosis .

#### 4. CONCLUSIONS

Thus, the combined copper - and zinc deficient TRACE ELEMENT holds a pathological decrease in the content of these trace elements in the blood serum, as well as indicators of copper - and zinc binding capacitance serum is reflected in the main exchange hematopoietic microcell a- iron.

#### REFERENCES

- [ 1] Agadzhanian N.A., Skalny A.V. Chemical elements in the environment and the ecological portrait of a person. - M .: Publishing house of KMK, 2000 .-- 83p.
- [ 2] Akhmedova N.Sh., Boltaev K.Zh. Some hematological, biochemical indicators of the macro- and microelemental status of the body in women of fertile age in normal conditions and with iron deficiency // Problems of Biology and Medicine. # 1. 2011 pp 20-23
- [ 3] Ibragimova M.Ya., Sabirova L.Ya., Berezkina E.S., Skalnaya M.G. et al. The relationship of the imbalance of macro- and microelements and public health // Kazan Medical Journal. - 2011. - T.92, No. 4. - S. 606-609.
- [ 4] Lugovaya E.A., Stepanova E.M., Gorbachev A.L. // Approaches to assessing the elemental status of the human body // Trace elements in medicine. - 2015. -No.16 (2). - S.10-17.
- [ 5] Prasad A.S. Zinc in the human body: health disorders and therapeutic effects // Trace elements in medicine. - 2014. - T.15, Issue 1. - P.3-12.
- [ 6] Skalnaya MG, Demidov VA On the limits of physiological (normal) content of Ca, Mg, P, Fe, Zn and Cu in human hair "Trace elements in medicine", 2003. - V. 4., Issue. 2
- [ 7] Sharmanov.T.Sh. Nutrition is the most important factor in human health. - Almaty: Asem-System, 2010 .-- 480 p.
- [ 8] Reddy M.B., Hurrell R.F., Cook J.D. Estimation of nonheme-iron bioavailability from meal composition. Am. J. Clin. Nutr. 2000; 71 (4): 937-43.
- [ 9] 
- [ 10] Исходный текст
- [ 11] Таким образом, при сочетанном медь – и цинкдефицитнымгипомикроэлементозом имеет место патологическое снижение содержания этих микроэлементов в сыворотке крови, а также показателей медь – и цинксвязывающей емкости сыворотки крови, что отражается и на обмене основного гемопэтического микроэлемента- железа.
- [ 12] Предложить лучший вариант перевода