

TOXIC AND OPPORTUNISTIC TRACE ELEMENTS IN THE HAIR OF PSORIASIS PATIENTS¹*Zhanabayeva G.U., ²Akhmedjanova Z.I. and ³Danilova E.A.¹Republican Dermato-Venerological Dispensary, Nukus.²Institute of Human Immunology and Genomics, Academy of Sciences of the Republic of Uzbekistan.³Institute of Nuclear Physics, Academy of Sciences of the Republic of Uzbekistan.***Corresponding Author: Zhanabayeva G.U.**

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Chemical homeostasis is an essential component of health, and excessive or insufficient levels of macro and trace elements in the organism is considered as a risk factor for pathological changes.^[1]

As markers of ecological disadvantage in solving biomonitoring problems, and for the detection of chemical homeostasis can protrude hair, because they accumulate macro- and trace elements that enter the body with drinking water, food, air.^[2]

Despite a long history of studying the microelement composition of hair, there is no scientifically based approach to its use in environmental and medical research.^[3]

The content of trace elements in the hair is influenced by many factors of different nature, and if the external effects of the elements on humans are weak, their contribution is comparable to that of environmental (medical) component, and interpretation of the obtained results ambiguous.^[4]

Teaching about microelements as diseases, syndromes and pathological conditions, caused by excess, deficiency or imbalance of microelements in the human body, is at a fundamentally new stage of its development.

The content of heavy metals, such as lead, chromium, nickel, manganese, vanadium, cadmium, is most often studied. These trace elements in excess concentrations are toxic agents, on the background of which may develop serious diseases or they can be the initiators of many diseases.^[5,6]

The purpose of this study is to study the toxic and conventionally toxic elements in the hair of psoriasis patients

Materials and methods. We examined 74 patients with psoriasis, aged 18 to 65 years, who were treated at the Republican Dermatovenerological Dispensary in Nukus. All patients were examined clinically and laboratory, there was a consultation of specialists. The study of the content of toxic trace elements in the hair of patients conducted by neutron activation method in Institute of

Nuclear Physics AS RUz. Methods of sampling, The preparation and analysis is presented in.^[7] The statistical processing of the received data was performed using the Microsoft Excel 2010 software package

Results and discussion. A significant reliable decrease of Sb was revealed in all forms of psoriasis compared to reference values, the greatest decrease (3.5 times) is noted in erythrodermia psoriasis (0.065 0.032) ($p < 0.001$). Antimony in small quantities, as well as arsenic, can act as a stimulant of physiological processes.

Hg reduction is found with all forms of psoriasis (fig 1), the most pronounced decrease was observed in the vulgar form of psoriasis (0.079 0.022) ($p < 0.001$). In blood, more than 90% of mercury is associated with erythrocytes. Mercury can change the configuration and properties of the protein molecule, inactivating functional groups of tissue proteins, which leads to drastic changes in hormonal, enzymatic and immunological activity of proteins.

The Rb study showed a reliable decrease in its content for all forms, The largest decrease was 5 times in the clinical form of erythrodermia (Fig.1). The main functions performed by rubidium are considered - substitution in various potassium processes, activation of enzymes, it is a fairly strong stimulant of activation of antiallergic reactions of the body. There is very little research on the role of rubidium, but according to available literature, it directly affects the development of allergies. Its pronounced decline suggests that it has a direct impact on the manifestation of allergopathology and disturbance of the work of the whole organism.

Our results show that the concentration of uranium was normal for all clinical psoriasis forms (Figure 1).

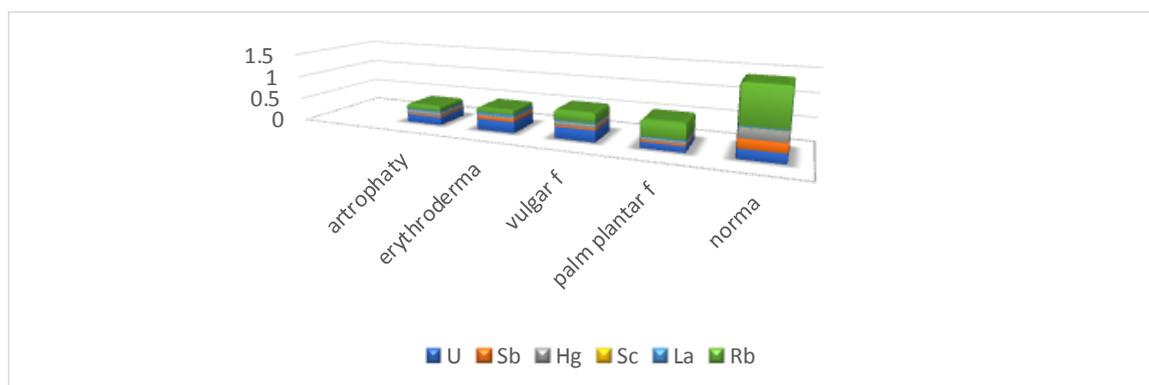


Figure 1. Results of changes in the content of opportunistic microelements in patients with psoriasis, ug/g.

From the conventionally toxic trace elements (Sr, Ba, Hg, Sb, Cd, Rb, As, La, Sc, U), the reliable reduction of Sb, Hg, Rb and an increase in La has been detected; normal values are U in all clinical forms of psoriasis, which implies the influence of toxic microelements on the functioning of systems of the body, and mediated by the immune system, patients with psoriasis.

Significant material accumulated on mechanisms of activation, differentiation and regulation of individual T populations and B – cells, make it possible and necessary to consider the effect of microelements in close relationship with the processes of normal immune response, allows you to determine specific points of application trace elements on certain sides of metabolism, specific lymphoid subpopulations

The results of the studies showed that U was normalized for all types of psoriasis. Sb has been reliably reduced with all forms of psoriasis, the largest Sb decrease is set in winter type (6 times). In summer and mixed type Sb was reduced by 5 times.

The largest decrease in Hg was found in the winter type (1.6 times), with a mixed type of 1.5 times and for the flight type 1.4 times compared to reference indicators.

Rb was reliably reduced in all forms, with the largest decrease of 4 times in the mixed psoriasis type.

The decrease of Sc was greatest in the winter type (1.5 times) of psoriasis. The increase of La was detected at the summer psoriasis type in 1.5 times (table 1).

Table 1: Results of changes of average content of conditional-toxic microelements in patients with psoriasis by clinical types, ug/g.

Эле-мент	mixed type n=31	winter type n=29	summer type n=14	norma
U	0.22±0.055	0.22±0.032	0.30±0.090	0.1-0.3
Sb	0.042±0.0082	0.033±0.0033	0.041±0.0039	<0.2
Hg	0.067±0.011	0.061±0.0099	0.069±0.026	0.1-0.3
Sc	0.0070±0.0031	0.0040±0.00032	0.0069±0.0017	0.006-0.015
La	0.028±0.0048	0.025±0.0036	0.061±0.014	0.02-0.04
Rb	0.13±0.015	0.21±0.058	0.46±0.11	0.5-1.0

Clinical medicine still underestimates the importance of micronutrient deficiency. Exact statistics of these peculiar pathological processes do not exist in humans. Meanwhile, the number of patients with latent and manifesting forms of microelemental deficiency is very high.

A number of microelements – fluorine, cadmium, lead, silicon and others have osteotropic properties, which is of great importance in clinical pathology. Under certain conditions and essential the trace elements may have toxic effects. However, some trace elements, for example, cadmium and lead, which have a long-standing toxic reputation, have some properties of essential microelements. Problem of correction of microelement

status the organism cannot be solved without data on the interaction of microelements and macroelements, which can be antagonistic and synergistic. In nature, coordinated effects of several microelements. There are reasons to pay attention to pairs and even triads of microelements; which have synergistic or antagonistic effects on various physiological and pathological indicators.

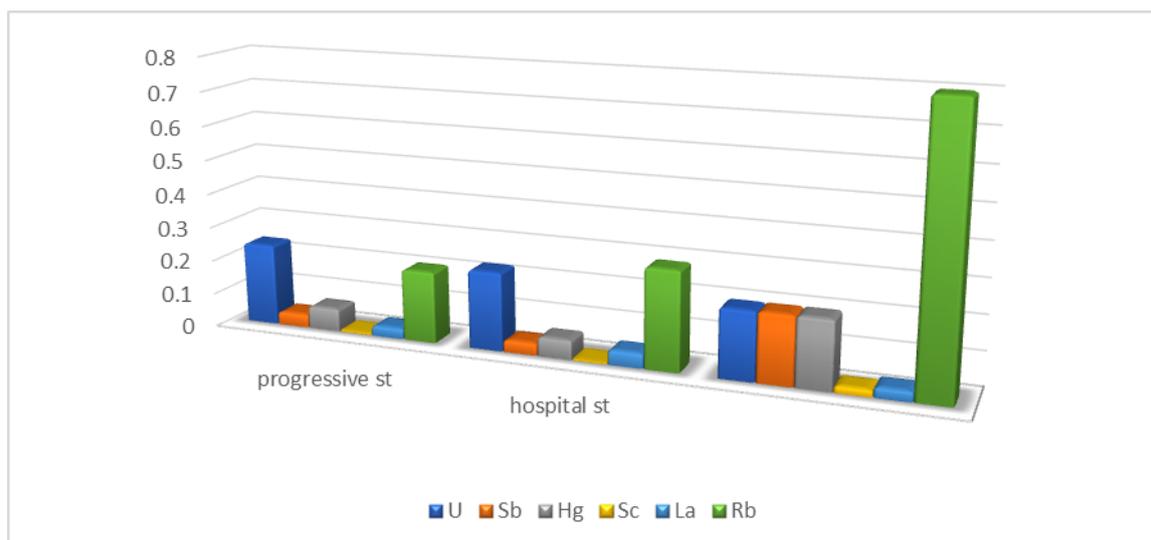


Fig. 2: The results of changes in the conditionally toxic microelements in patients with psoriasis by clinical stage.

CONCLUSION

Studies showed that of the opportunistic elements only U was found to be normal at all stages psoriasis. Sb has been reliably reduced at all stages of psoriasis, Sb reduction is established Both in the stationary form 5.5 times and in the progressive stage of psoriasis 5 times.

A decrease of Hg at the stationary stage in 2 times and at the progressive stage in 1.5 times was detected.

Rb was reliably reduced at all stages, with the largest decrease being found in the progressive stage of psoriasis.

Sc is reliably lowered at all stages of psoriasis, the greatest decrease is detected at stationary stage (0.0054 0.00096) psoriasis.

In our study, a 2-fold increase in La was detected in the stationary stage of psoriasis (Fig 2).

A study of conventionally toxic microelements (Sr, Ba, Hg, Sb, Cd, Rb, As, La, Sc, U), showed a credible reduction of Sb, Hg, Rb, Sc. Normal U value at all clinical forms of psoriasis and only La was promoted under the summer psoriasis type.

The medical aspects of the study of microelements are not yet sufficiently developed. Some important sections of pathology microelements are still not studied. Microelements, play a large role not only in vital processes of a normal organism, as V. I. Vernadsky asserted, but they retain their importance in the patient organism.

The quantity of an element in an organism is determined by its content content in the external environment, as well as the properties of the element itself. There were large differences between the enormous concentrations of aluminium, silicon and titanium in the Earth's crust and their negligible amount in living matter, living

matter, the concentration of elements in a living substance is directly proportional to their content in habitat, taking into account the solubility of their compounds.

The problem of correction of microelement status is the main task for today of studying the influence of microelements on living organisms. Some diseases caused by micronutrient deficiency, flow latently, which is particularly important for contingents with increased sensitivity to all fluctuations micronutrient homeostasis. This applies to children, elderly, weakened.^[8]

Conducted by us research of toxic and opportunistic microelements showed the importance of these microelements in psoriasis, which should be taken into account when treating this pathology.

LIST OF REFERENCES

1. Sarf E.A., Makarova N.A., Bielskaya L.V. Determination of macro- and microelemental composition of saliva workers CHP // Human Ecology, 2022; 29(4): 285-295. Doi: <https://doi.org/1017816/humeco104698>
2. Gubareva L.I., Soloviev A.G., Bicheva G.V., Yermolova L.S. Combined influence of hypo- and hypermicroelements on the functioning of the cardiovascular, endocrine systems and the level of anxiety of teenagers // Human Ecology, 2017; 24(8): 29-36. doi: 10.33396/1728-0869-2017-8-29-36.
3. Khranov A.V., Konrosh L.V., Pankratova M.YU, Vezhenkova I.V. Influence of the chemical composition of drinking water on the level of accumulation of toxic // Human Ecology, 2019; 6: 11-16. doi: 10.33396/1728-0869-2019-6-11-16
4. Okina O. I., Lyaponov S. M., Gorbunov A. V. Use of hair microelement composition in environmental and medical // Human Ecology, 2009; 4: 45-51
5. Zaitsev I.V., Zurnadzhyantz V.A., Kutukov V.V., Kutukov V.E. Cumulation of microelements in the blood with some pathology of urinary division

- Systems // Astrakhan Medical Journal, 2015; T. 10(2): 47-51.
6. Chashchin V.P., Ivanova O.M., Ivanova M.A. Medico-ecological aspects of communication of disorders of human functional systems with the content Microelements of barium and strontium in the body. Review of the literature // Human Ecology, 2019; 4: 39-47. doi: 10.33396/1728-0869-2019-4-39-47
 7. Danilova E.A., Cyst A.A., Osinskaya N.S., Khusniddinova S.H. Application of neutron activation analysis to assess the elemental status human body. Medical physics, 2008; 3: 73-77.
 8. Bulatov R.N, Avdeenko V.S. "History of the Study of the Influence of Microelements on the State of Animals [Abstract, 2015; 1-28.