PATHOLOGICAL CONDITIONS CAUSED BY AN IMBALANCE OF ME IN THE HUMAN BODY

[1]Ismatov N., [2]Akhmedov A.A., [3]Shernazarov F. F
[1,2,3]Samarkand State Medical University
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Abstract. *The formation of the elemental composition of the organism in the process of ontogenesis is dictated by its current physiological need for macro and microelements, and is also significantly influenced by biogeochemical factors and the degree of environmental pollution with toxic elements (Revich B.A., 1996; SaetYu.E. et al., 1990). Deviation in the intake of macro- and microelements into the body, a violation of their ratio in the diet directly affects the activity of the body, can reduce or increase its resistance, and hence the ability to adapt (Kovalevsky V.V., 1982; Rikhvanov L.P. and et al., 1993; Agadzhanyan HA et al., 1998; Skalny AB, Kudrin AB, 2000; Suslikov V.L., 2000; Agadzhanyan HA, Skalny AB, 2001).*

Keywords: *to date, a large number of works have been carried out related to the study of the content and distribution of individual elements in the body, their physiological role, imbalances in the balance of elements in the body and the development of pathological conditions associated with this. (Avtsyn A.P. et al., 1991; Agadzhanyan HA et al., 1999; Skalny AB, 2000; Skalny AB, Rudakov I.A., 2004).*

The formation of the elemental composition of the organism in the process of ontogenesis is dictated by its current physiological need for macro and microelements, and is also significantly influenced by biogeochemical factors and the degree of environmental pollution with toxic elements (Revich B.A., 1996; SaetYu.E. et al., 1990). Deviation in the intake of macro- and microelements into the body, a violation of their ratio in the diet directly affects the activity of the body, can reduce or increase its resistance, and hence the ability to adapt (Kovalevsky V.V., 1982; Rikhvanov L.P. and et al., 1993; Agadzhanyan HA et al., 1998; Skalny AB, Kudrin AB, 2000; Suslikov V.L., 2000; Agadzhanyan HA, Skalny AB, 2001).

Early detection of metabolic disorders and related therapeutic measures require modern diagnostic methods. One of these methods is the assessment of the mineral balance in the human body by quantitative determination of the elemental composition of various biosubstrates (hair, nails, urine, saliva, etc.).

It is known that the content and, especially, the ratio of elements in biosubstrates are a sensitive indicator of mineral homeostasis, and the effectiveness of such determinations increases with increasing the number of characteristics taken into account (in this case, determined in one sample elements). The process and signs of metabolic disorders of mineral elements is one of the most sensitive and early diagnosed indicators of the “failure” of immunity mechanisms (Skalny AB et al., 2004).

In recent years, close attention has been paid to the study of the elemental composition of hair, which reflects the internal state of the body (Avtsyn A.P. et al., 1989-1991; Skalny AB, 2004). The composition of hair is much less subject to fluctuations in comparison with biological fluids. Hair is an ideal object for studying the content of macro- and microelements: it is easy to collect, transport and store. Hair has a high degree of growth, combined with a lack of metabolic activity in the grown hair. Thus, there are numerous reports on the use of saliva as an unconventional

material for clinical and laboratory analysis. The study of saliva has several advantages over routine laboratory diagnostic methods using blood taken from a finger or vein. First of all, this is the simplicity and convenience of collecting saliva, the non-invasiveness and painlessness of this procedure, the absence of the risk of infection, the possibility of multiple samples (Shabas M.V., 1997, Ordzhonikidze G.Z., 2004).

The stability of the chemical composition of various living fluids organism is a necessary condition for the effective functioning organs and systems. This fully applies to saliva, which plays an important role in ensuring the normal function of the organs of the oral cavity, gastrointestinal intestinal tract and the whole organism. However, the composition of saliva including the chemical elements contained in it, has not been studied enough.

Thus, in the most complete of the published data on the content chemical elements in the tissues and fluids of the human body (Semenov N.K. 1971; Iyengar GV, Kollmer WE, Bowen HJM, 1978; Treagan L., 1983), there is poor comparability, and even some inconsistency available information, due, among other things, to the imperfection of the analytical technique used.

Currently, doctors are particularly interested in two groups of chemical elements. These are, first of all, essential elements, which are indispensable nutritional factors. Their value is basically like vitamins. Essential elements cannot be synthesized by the organism, but must be supplied to it from the external environment. The second group of these substances are toxic microelements, which are currently among the main environmental pollutants. If in diseases caused by a deficiency of essential microelements, we mainly encounter deficiency diseases, then in various forms of contact of the body with toxic microelements, doctors are concerned about diseases and intoxication syndromes (toxicopathies). The complexity of the problem lies in the fact that the manifestations of insufficiency and intoxication can be extremely diverse, but also in the fact that the essential elements themselves under certain conditions can cause toxic reactions, and individual toxic microelements at a certain dosage and exposure can reveal the properties of essential microelements, i. e. turn out to be useful and even irreplaceable (Avtsyn A.P., 1989).

Each of the microelements has both general and individual features of its reception, utilization, storage and transportation.

In accordance with existing ideas about the physiological role of chemical elements and their content in the human body and vertebrates, it seems reasonable to classify elements with their division into three large groups - macroelements, essential microelements, toxic microelements (Skalny AB et al., 2004). represented by calcium, phosphorus, magnesium, potassium, sodium, sulfur, chlorine. The group of essential (and conditionally essential) trace elements is represented by fluorine, vanadium, silicon, selenium, copper, lithium, manganese, zinc, boron, etc.

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