TO THE ASSESSMENT OF ORGANISM AEROBIC RESERVES IN CONNECTION WITH MIGRATION

Safronova N.S., Fomenko A.V.

Taurida National V.I. Vernadsky University, Simferopol, e-mail: tnu-fr@rambler.ru

Within the research of human adaptation to a change of permanent residence the assessment of migration impact on the migrants' health and aerobic organism reserves is of special interest. According to modern concepts the figure of maximal oxygen consumption (MOC) is an objective characteristic of human aerobic capacity. However, direct measurement of this parameter is quite time-consuming and not expedient. Moreover, during the physical working capacity test «to refusal» untrained people rarely reach the level of MOC and stop testing much earlier at the so-called symptom-limited MOC (SL-MOC). At the same time there are a number of methods that allow indirectly and quite accurately determine this figure, for example, by calculating PWC_{170} test results. Therefore, the ratio of oxygen (O_2) consumption speed at the level of individual maximum endurable testing capacity, i.e. SL-MOC, to calculated value of MOC may act as one of the characteristics of aerobic organism reserves. Obviously, the higher the index is, the higher the individual reserves and capabilities to achieve aerobic maximum are. In this context, the determined aim of this paper is to conduct a comparative analysis of organism aerobic reserves in groups of Crimean Tatars migrated to the Crimea and the ones have been living there since birth.

The research involved 45 Crimean Tatars aged 18–21. The first group consisted of 24 people, born and residing in the Crimea, the second one comprised of the ones who migrated to the peninsula at least 15–20 years. Research methods include working capacity testing, spirography, Gas analyzer research. The results of the research showed that migrants' organism aerobic reserves, according to the ratio of MOC to SL-MOC, were more than 6% ($p < 0,05$) reduced in comparison with the second group of examined. It is also interesting to note that the actual values of SL-MOC and MOC was also 16% ($p < 0,05$) and 8% ($p < 0,05$) accordingly reduced. Thus, there is a reason to believe that the impact of migration negatively affected aerobic reserves of examined. The results of the research can be further used in the diagnostics of health and in the development of individual health-preserving technologies for people who have changed their residence.

The work is submitted to the International Scientific Conference «Ecology and human health», Mauritius, February, 17–24, 2014, came to the editorial office on 07.02.2014.

THE CONTROL OF OXYGEN TENSION IN MUSCLE TISSUE USING BIOEFFECTIVE PULSE-FREQUENCY GENERATOR NEYROTON-01

Shaov M.T., Pshikova O.V.

Kh.M. Berbekov Kabardino-Balkar State University, Nalchik, e-mail: olgapshikova@mail.ru

The article discusses the results of studying remote (non-invasive) control of oxygen tension in muscles of experimental animals using bioeffective pulse-frequency generator Neyroton-01 – a model of acoustic-electromagnetic continuum adapted to the impulse hypoxia of nerve cells. We suggest a hypothesis on the quantum mechanical (quantum theory of multiparticle and multielectron systems) nature of the «phenomenon of adaptation» encoding in the system of neuron oscillators. It was established that under the influence of the test technology, the level of pO_2 in the muscles of experimental animals decreases prior to the onset of tissue hypoxia, and then, as part of the aftereffect, there is a significant increase of pO_2 up to the level of physiological hyperoxia, which, according to the literature, is a sign of adaptation. Therefore, we can assume that we found a new and efficient method of forming the state of adaptation in the body other than the already known methods, such as high-altitude acclimatization, altitude-stepwise, barophysical and normobaric adaptations, exhausting physical exercises, etc. Results of this work suggest the real possibility of a non-invasive control of pO_2 levels in body tissues, which may be important for health care, mountaineering, physical culture and sports, space missions, as well as for the creation of new bioeffective pulse-frequency generators.

As shown by long-term studies (M.T. Shaov, 1981; O.V. Pshikova, M.T. Shaov, T.Sh. Khapazhev, 1995; M.T. Shaov, O.V. Pshikova, Kh.M.Kaskulov, 2002; O.V. Pshikova, I.S. Abazova, 2011), reduced frequency of impulse electrical activity (IEA) and increase in oxygen tension (pO_2) in experimental animals are indicative of the adaptation of their cerebral cortex nerve cells to impulse hypoxia caused by barophysiological appliances or high altitude conditions.

As a rule, the IEA frequency decreases from $10,0 \pm 0,43$ to $5,17 \pm 0,45$ pulses/s on the average, whereas pO_2 usually increases from $24,0 \pm 1,40$ to $33,4 \pm 2,20$ mm Hg. This implies that the dynamics of IEA and pO_2 is carried out within the famous Synergetic rule of Verhulst, according to which, indicator fluctuations (pO_2 and IEA) must not exceed the level of their initial value by large values (I.A. Eryukhin, 2000).

In another series of experiments it was found that at low-frequency IEA (< 10 Hz), nerve cells effectively control the cardiac activity (Z.A. Shidov, O.V. Pshikova and others, 1995) and adaptive capacity (O.V. Pshikova, 1999) of experimental animals' body: at normal (normoxic) frequency in the