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MORPHOFUNCTIONAL FEATURES OF LONG-TERM ADAPTATION AND INDIVIDUAL DEVELOPMENT IN SPORTSMEN

Vysochin Yu.V., Denisenko Yu.P.
Saint-Petersburg State University
Saint-Petersburg, Russia
Kama State Academy of Physical Culture, Sport and Tourism
Naberezhnye Chelny, Russia

Various types of long-term adaptation or individual development are formed at a more or less prolonged effect of some or other adaptogenic factors on the body. In the people with low capacity of inhibitory-relaxation functional system of defence from extreme conditions (IRFSD) irrespective of age the adaptation takes course due to muscle bulk and strength gaining against the skeletal muscles' relaxation low rate, i.e. a **hypertrophic type of individual development** is formed. At the IRFSD medium capacity a **passage type** is formed, and at the IRFSD high capacity a **relaxation type of individual development** is formed. A high relaxation rate and medium muscle strength indexes are indicative of this type (Vysochin Yu.V., 1988; Denisenko Yu.P., Vysochin Yu.V., 2002).

Considerable morphofunctional alterations at long-term adaptation touch not only the neuromuscular, but all the other systems of the body as well. In the hypertrophic type people the hyperexcitability and the CNC inhibitory systems' low activity are registered, the hyperkinetic (uneconomical) blood circulation type (CT) and highly disharmonious constitutional type prevail. The cardiac performance low economical efficiency, a higher level of energy consumption at rest and at testing loads, an increased concentration of energy exchange metabolites, adrenalin and stressor hormones, but a lower level of noradrenalin and anabolic steroids at rest and loads in blood, low stress and anoxia tolerance, a reduced immunological resistance, high incidence of disease and traumatism are indicative for them.

The relaxation type of individual development is the most profitable in all intents. For relaxation type persons the CNC exciting and inhibitory processes' balance, high rate of muscles' relaxation, excellent regulation and movement coordination, perfect reaction to moving objects, that guarantees the sport, everyday and street traumatism minimization, are specific. The most economical – eukinetic circulation type prevails in them, the cardiac performance high economical efficiency, the minimal level of energy consumption, a decreased concentration of energy exchange metabolites in blood, a high rate of reparative processes and resynthesis of energy resources, excellent physical performance and stamina prevail in them. They excel with an increased stress tolerance, twice or trice as seldom they are subject to overwork and diseases, as compared to the hypertrophic type persons. Relaxation type sportsmen, as contrasted with hypertrophic type ones, enjoy considerably greater sport longevity, stand physical and psychological stresses far easier, are subject to various overworks, traumas and diseases 8-10 times as seldom and achieve the highest sport results (Vysochin Yu.V., Lukoyanov V.V., 1987; Denisenko Yu.P., 2007).

With the increase of skeletal muscles' voluntary relaxation rate (VRR) and the formation of relaxation type of long-term adaptation the sport traumatism decreases progressively from 95-100% (at the VRR less than 4,01/sec) to 5-0% (at the VRR more than 9,01/sec) and, therefore, their health improves the same progressively. Our multiyear investigations testified that even in the most traumatic kinds of sport, one can almost fully make away with injuries (except for the traumas emerging at gross violation of game rules by the rival) due to the correct organization of the work-out session aimed at the CNC nervous processes' balance normalization, muscles' VRR increase and long-term relaxation type formation.

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BIOMETRIC METHOD OF DIAGNOSTICS OF DIABETES

Yakusheva M.Yu., Sarapultsev A.P., Sarapultsev P.A.
Institute of Immunology and Physiology UB RAS
Ekaterinburg, Russia

The omnipresent growth of diabetes incidence in economically developed countries and the pathology conditioned by it and causing not only medical, but also social-and-economical problems in the society, defines the topicality of the investigation carried out. However, there are no authentic data concerning the value of individual disposition and pathophysiological mechanisms of its development up to the present moment.

The main task of the carried out research has been the development of biometric methods of II type diabetes predisposition general criteria detection. The offered methods of screening study based on the human dermatoglyphic picture analysis are simple enough, economic; they don't require expensive equipment, chemical agents and highly qualified personnel for their realization; they are noninvasive and easy for the patient. At the examination the dermatoglyphic signs of palms and fingers of both hands are read by means of a special fingerprint scanner, then they are treated with the help of a special computer program. To detect the diagnostic criteria of II type diabetes development we examined 63 II type diabetes patients by the dermatoglyphic method, the control group was made of 63 persons without diabetes, who were chosen by the method of "directed selection" according to their age, sex and nationality. The mathematical classification techniques based on the image discrimination theory were used to treat the material. Due to the research the following dermatoglyphic picture characteristic features have been detected in the II type diabetes patients: the general, total and palmary crest count increase ab, bc, cd, the increase of number and width of palm lines, the axial triradius position in the intermediate t^1 and lateral t^1b position, the palm triradius reduction c, the occurrence of any patterns in the hypothenar and curlicues in the interdigital zone. The developed biometric methods based on the dermatoglyphic picture analysis are able to detect general criteria of predisposition to diabetes development.

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