МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
Харківський національний медичний університет
(кафедра фізіології)
Харківський національний фармацевтичний університет
(кафедра біології, фізіології і анатомії людини)
Харківський національний педагогічний університет ім. Г.С.Сковороди
(кафедра анатомії та фізіології людини ім. проф. Я.Р.Сінельникова)

ФІЗІОЛОГІЯ МЕДИЦИНІ, ФАРМАЦІЇ ТА ПЕДАГОГІЦІ: «АКТУАЛЬНІ ПРОБЛЕМИ ТА СУЧАСНІ ДОСЯГНЕННЯ»

Тези доповідей
ІІ Всеукраїнської студентської наукової конференції з фізіології
з міжнародною участю
12 травня 2015 року

Харків ~2015

Фізіологія медицині, фармації та педагогіці: «Актуальні проблеми та сучасні досягнення»: тези доповідей IIВсеукр, студент, наук. конф. з фізіології з міжнародною участю (12 травня 2015 р.). - Харків : ХНМУ, 2015. –62 с.

Физиология медицине, фармации и педагогике: «Актуальные проблемы и современные достижения»: тезисы докладов II Всеукр. студен, науч. конф. по физиологии с международным участием (12 мая 2015 г.), – Харьков : ХНМУ, 2015. –62 с.

Physiology to Medicine, Pharmacy and Pedagogies: «Actual Problems and Modern Advancements»: brief outline reports of I Ukrainian Students Scientific Conference of Physiology with international participation (May, 12 2015). –Kharkov : KhNMU, 2015. –62 p.

Адреса редколегії: м. Харків, пр. Леніна, 4, ХНМУ, кафедра фізіології.

ЗМІСТ

Andrew Brian Amoah-Danful, Karmazina I.S., Isaeva I.N.

CIRCULATORY DYNAMICS DURING EXERCISE

Kharkov National Medical University, Kharkov, Ukraine

Background. Physical activity is accompanied by one of the most natural for the body's adaptive responses, which requires a good interaction of all parts of the circulatory system. The fact that skeletal muscles make up to 40 % of body weight, and the intensity of their activity may vary within very wide limits, puts them in a special position compared with other organs. Therefore, in the process of evolution close relationship of muscle contraction and cardiovascular system has been developed creating, as far as possible, the conditions for maximal muscle blood flow, even at the expense of decreased blood flow in other organs and systems which is regulated by neural and humoral mechanisms.

Results. Even before the muscle work, before a start point, there is a series of changes in various bodily functions. Significance of these changes is to prepare the body for the successful implementation of future activities. By nature the prestarting reaction is a conditioned reflex. Their value is to mobilize the cardiovascular system, so even before the muscle activity heartbeats becoming more frequent, and the pressure increases. At the onset of exercise, signals are transmitted notonly from the brain to the muscles to cause musclecontraction but also into the vasomotor center to initiate mass sympathetic discharge throughout the body. Simultaneously, the parasympathetic signals to theheart are attenuated. Therefore, three major circulatory effects result.First, the heart is stimulated to greatly increased heart rate and increased pumping strength as a result of the sympathetic drive to the heart plus release of the heart from normal parasympathetic inhibition.Second, most of the arterioles of the peripheral circulation are strongly contracted, except for thearterioles in the active muscles, which are stronglyvasodilated by the local vasodilator effects in themuscles and increase in sympathetic activity through cholinergic fibers, intensifying glycolysis in skeletal muscles, causes expansion of blood vessels (cholinergic vasodilation). Thus, the heart is stimulatedto supply the increased blood flow required by themuscles, while at the same time blood flow throughmost nonmuscular areas of the body is temporarilyreduced. Two of the peripheral circulatory systems, the coronary and cerebral systems, are spared this vasoconstrictoreffect because both these circulatory areashave poor vasoconstrictor innervation—fortunately so because both the heart and the brain are as essential to exercise as are the skeletal muscles.Third, the muscle walls of the veins and other capacitative areas of the circulation are contracted powerfully,which greatly increases the mean systemic fillingpressure. These effects, working together, virtually always increase the arterial pressure during exercise. This increase can be as little as 20 mm Hg or as great as 80 mm Hg,

depending on the conditions under which the exercise is performed. When a person performs exercise under tense conditions but uses only a few muscles, the sympathetic nervous response still occurs everywhere in the body. In the few active muscles, vasodilation occurs, but everywhere else in the body the effect is mainly vasoconstriction, often increasingthe mean arterial pressure to as high as 170 mm Hg. Conversely, when a person performs massive whole-body exercise, such as running or swimming, the increase in arterial pressure is often only 20 to 40 mm Hg. This lack of a large increase in pressure results from the extreme vasodilation that occurs simultaneously in large masses of active muscle. Many different physiologic effects occur at the same time during exercise to increase cardiac output approximately in proportion to the degree of exercise. In fact, the ability of the circulatory system to provide increased cardiac output for delivery of oxygen and other nutrients to the muscles during exercise is equally as important as the strength of the muscles themselves in setting the limit for continued muscle work. In this case, the CO may increase by 5-6 times and up to 20 l/min.

Conclusion. Regular physical activity is one of the most important things for health. It helps to control weight, reduce risk of cardiovascular disease, reduce risk for type 2 diabetes and metabolic syndrome, reduce risk of some cancers, strengthen bones and muscles, improve mental health and mood, improve ability to do daily activities and increase chances of living longer.

Mohamad Sultan, Isaeva I.N., Karmazina I.S.

VARIATION OF ACTIVITIES OF DIFFERENT PARTS OF CORTEX HEMISPHERES AND CARDIOVASCULAR SYSTEM BETWEEN MALES AND FEMALES DURING STROOP TEST

Kharkiv National Medical University, Kharkiv, Ukraine

Background. According to neurophysiology, there is a difference in the levels of the activity of different parts of the cortex hemispheres between males and females, which is manifested by the difference of speed of decision making, and reactivity, accompanied by different levels of physiological changes of some vital signs, such as elevating the heart rate, and blood pressure, as it can be seen in the results of the stroop test.

Purpose. To investigate the differences of autonomic supply in males and females, during the state of mental activity using Stroop test.

Materials and methods. The study included 20 young adults (19-24 years), among them 10 males and 10 females. Vegetative indicators were selected for studying such as: systolic (SAP) and diastolic (DAP) arterial blood pressure which were studied by Korotkov method (mmHg); heart rate (HR) (bpm) which was calculated on the radial artery pulse, and Dagnini-Aschner (oculocardiac)