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АКТУАЛЬНІ ПРОБЛЕМИ ТА СУЧАСНІ ДОСЯГНЕННЯ**

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The results of the research have shown, that the crucial role and thus the most informative value in diagnostics of ectopic pregnancy plays the measuring of β -hCG levels in the serum and the transvaginal ultrasonography. Combined use of them allowed not only to diagnose the EP, but also to conduct dynamic monitoring of pregnancy and the efficiency of the treatment. Examining and treating women due to general clinical recommendations in the 1 group did not provide conditions for organ-preserving surgery in 72 %. In the 2 group organ-preserving surgeries were performed laparoscopically in more than 90 %!

Conclusions. Early, self-referral to the hospital, self-awareness and consequently opportune diagnostic and treatment measures due to supplemented algorithm helped to achieve higher indexes of organ-preserving surgeries in the 2 group. Early and accurate detection of ectopic pregnancy is critical to decrease morbidity and mortality and reduce costs associated with repeated emergency department visits, hospitalization, emergency and radical surgery, and future infertility evaluation and treatment.

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FEATURES OF REGULATION OF CIRCULATION DURING EXERCISES

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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 not only from the brain to the muscles to cause muscle contraction but also into the vasomotor center to initiate mass sympathetic discharge throughout the body. Simultaneously, the parasympathetic signals to the heart 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 the arterioles in the active muscles, which are strongly vasodilated by the local vasodilator effects in the muscles and increase in sympathetic activity through cholinergic fibers, intensifying glycolysis in skeletal muscles, causes expansion of blood vessels (cholinergic vasodilation). Thus, the heart is stimulated to supply the increased blood flow required by the muscles, while at the same time blood flow through most nonmuscular areas of the body is temporarily reduced. Two of the peripheral circulatory systems, the coronary and cerebral systems, are spared this vasoconstrictor effect because both these circulatory areas have 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 capacitance areas of the circulation are contracted powerfully, which greatly increases the mean systemic filling pressure. 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 increasing the 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.

Hady Al-Rihani, Irina S. Karmazina
**CYTOKINES AND C-REACTIVE PROTEIN TRIGGER
 THE HEMOSTASIS SYSTEM IMBALANCE IN INFLAMMATION**

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Recent studies have confirmed hypothesis about crucial role of cytokines and C-reactive protein (CRP) in progression of inflammation (Г.И. Васильева, 2001). Cytokines are pluripotent short-distant molecules that are synthesized by activated cells of immune system; they mediate intercellular communications as well as stimulation or inhibition of cell growth, their differentiation, functional activity and apoptosis. CRP has been evaluated as "gold marker" of inflammation and predictor of various pathological states such as myocardial infarction, acute renal and cardiac insufficiency, acute coronary syndrome, sepsis, neoplasia of different localizations. It has been proved experimentally that pro-inflammatory cytokines such as interleukin-1 (IL-1), IL-6, IL-12, IL-3, tumor necrosis factor- α (TNF- α) realized their effects through direct stimulation of CRP expression (B. Paimany, 2002). On the other hand, reaction of inflammation, accompanying appearance of foreign antigens in an organism (independently from their origin: whether these are bacteria and viruses, or self-cells malignization), often results in disorders of hemostasis system. Imbalance develops due to the extra activation of coagulation mechanisms with simultaneous downregulation of anticoagulant pathways and suppression of fibrinolysis (S. Lipinsky, 2011). Nowadays, cytokines and CRP are considered as highly relevant factors which trigger both inflammation and hypercoagulation (T. van der Poll, et al., 2011). Nevertheless, mechanisms of the interplay between cytokines and CRP, triggering inflammation reaction and factors of haemostasis, are still unclear and require following investigations.

The aim of our research was studying of pro-inflammatory link of cytokines' network and CRP concentration as well as parameters of hemostasis systemic conditions of inflammation process.

For the research, blood samples of patients with acute inflammation (paratonsillar abscess, n=25) have been used; control cohort was represented by healthy people (without acute or chronic inflammation, n=20). Parameters of hemostasis system such as fibrinogen concentration, activated partial thromboplastin time (APTT), prothrombin time (PT), international normalized ratio (INR) and activity of antithrombin III (AT III) have been defined in blood plasma with the help of standard kits ("Renam", Russia) by routine methods. Concentrations of cytokines such as IL-1 β , IL-6 and TNF- α have been determined in blood sera by the immunoenzyme method ("Vector-best", Russia). CRP concentration has been defined by the turbid metric method (kits "Vital Diagnostics", Russia). Statistical processing of data has been used for figures assessment (Excel for Windows 10).

It has been found out that in blood sera of patients with paratonsillar abscess concentrations of pro-inflammatory cytokines as well as CRP were elevated in comparison with control cohort which therefore results from acute inflammation process. Thus, concentration of IL-1 β has been increased in 2.8 folds (12.48 \pm 2.88 pg/ml against 4.37 \pm 1.84 pg/ml in control; p<0.01); concentration of IL-6 has exceeded control values in 2.6 times (9.99 \pm 1.76 pg/ml, and 3.89 \pm 1.81 pg/ml in control; p<0.01); and concentration of TNF- α has been elevated in 3.6 times (11.35 \pm 1.76 pg/ml, and 3.11 \pm 1.23 pg/ml in control; p<0.01). Concentration of CRP has been increased in 2.0 folds (5.55 \pm 0.63 pg/ml, and 2.78 \pm 0.38 pg/ml in control; p<0.01).

Investigated parameters of haemostasis system have demonstrated signs of hypercoagulation in patients with paratonsillar abscess. Concentration of fibrinogen has been elevated; it reached 5.11 \pm 0.64 g/L (3.15 \pm 0.43 g/L in control; p<0.01). Increase fibrinogen concentration results from inflammation due to the fact that fibrinogen is an acute phase reactant (E. Hantganet al, 2001). Elevations in fibrinogen levels are associated with an increased risk of thrombotic disease. Such parameters as APTT and PT have been shortened down; they have constituted correspondently 38.7 \pm 2.99 sec (46.9 \pm 4.98 sec in control; p<0.05) and 11.1 \pm 0.47 sec (14.5 \pm 0.8 in control; p<0.05). INR has been reduced till 0.84 \pm 0.04 (1.12 \pm 0.07 in control; p<0.05). Due to the fact that PT and INR reflect events of extrinsic pathway of coagulation cascade, their activation in inflammation process can be regarded as evidence that cytokines are involved into activation of this mechanism. This is in concern with results of multiple researches that have demonstrated that tissue factor (TF), which is the most important initiator of the extrinsic coagulation cascade, belongs to class II cytokine receptor family. It is the cofactor for the activated plasma clotting factor VII (FVIIa) which catalyzes the activation of factor X and IX and leads to the generation of thrombin and thus, finally, of a fibrin clot. Under physiologic conditions, TF is abundantly expressed only in the adventitia, nevertheless in many pathologic conditions its activation is induced by several inflammatory mediators such as IL-6 and IL-1 β (G. Demetz, I. Ott, 2011). Shortening of APTT, which is the parameter for the assessment of intrinsic mechanism of coagulation cascade, has revealed that cytokines may contribute into hypercoagulation by activation of this pathway as well. In accordance to scientific figures, inflammatory mediators presumably increase the number of microparticles in circulation, i.e. phospholipids for prothrombinase complex generation, through leucocyte activation, so that they can lead to factor XII activation and involvement of intrinsic mechanism of coagulation through kallikrein-kinin system (C.T. Esmon, 2005). Meanwhile, our research has shown that activity of AT III