

DOPING FOR ATHLETES BASED ON ERYTHROPOETIN

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Introduction. Today the concept of professional sport and doping is continuously connected. Because of the strong competition for the right to dominate in the world today, athletes are increasingly resorting to dangerous drugs, which lead to irreparable consequences. Bodybuilders and other athletes use different drugs and their complex combinations. Some are effective and generally accepted, and others raise questions and misunderstandings. Currently, doping agents are divided into five main groups: blood doping (central nervous system stimulants, analgesics); narcotics (narcotic analgesics); anabolic steroids; β -blockers; diuretics.

Erythropoietin (EPO) is a hormone that stimulates the blood cells production. In medical practice, the EPO is used to treat anemia caused by chronic renal failure. EPO can be used by athletes to increase the transport of oxygen in the body, the concentration of which increases with the amount of red blood cells, resulting in increased endurance. The negative consequences of receiving erythropoietin are: increased blood viscosity; increased risk of blood clots formation; the risk of virus infections such as hepatitis and HIV infection.

The **aim** of our work is to study the effect of erythropoietin on the human body, and whether it is appropriate for use as a doping drug; to learn clinical blood analysis techniques.

At the moment is almost impossible to reliably authenticated cases of administration of exogenous EPO in the body. To date, there are no universal methods of detection of EPO in the blood as an athlete doping. Since the natural and recombinant erythropoietin (rh-EPO) have the same amino acid structure and rh-EPO is virtually indistinguishable from its natural counterpart. The direct detection method is based on the minor differences in different isoforms of erythropoietin. Natural EPO predominantly glycosidic moieties are associated with more acidity, while rh-EPO have alkaline properties.

Materials and methods. The material for the EPO detecting is the urine. Methods of the urine sample purification and separation are fairly complex and requires a large amount of urine (to 1 liter). As indirect methods some oscillations of physiological blood parameters which are detected after the administration of EPO for the preliminary control such as the maximum value of the hematocrit, the maximum permissible values of hemoglobin are used. This is possible only when using blood as a sample for doping test. Certain biochemical tests, such as serum soluble transferrin receptor (sTfR) measurement are also used in doping control.