

## Endocrinology 2018: Arterial hypertension in patients taking anabolic steroids with progestin activity - Pavel Popov - RUDN University, Russia

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**Background:** The problems of development of cardiovascular disorders alongside with implementation of androgen replacement therapy with testosterone medications have been discussed in the scientific literature for a long time. Some authors noted in their patients a high packed cell volume characteristic of hormone replacement therapy, as well as dyslipidemia and progressive arterial hypertension, which develop with the use of androgenic anabolic steroids. Of course the risk of developing side effects such as hypertension after use of various forms of prolonged testosterone (testosterone enanthate etc.) compared with that of use of anabolic steroids is not the same. In our study the main attention is paid to such problem as arterial hypertension, which appears against the background of the use of anabolic preparations with progestin activity, characterized by absence of a carbon atom in the 19th position when compared with testosterone.

**Objectives:** The objective of this work is to study the special characteristics of the course of hypertension (the rate of progression) in patients who used drugs with anabolic activity that contact with receptors of progesterone compared with other forms of testosterone medications.

**Materials & Methods:** The study involved 44 patients (men) aged 21 to 40 years, including 23 people who, according to medical history, used drugs with anabolic and progestin activity for 1 month or more (observation group) and 21 people who used anabolic steroids without progestin activity (comparison group). Inclusion criterion - the level of luteinizing hormone (LH)  $<1.24$  mIU/ml. Dosages of drugs in both groups are comparable in terms of their anabolic activity. Clinical examination included analysis of complaints (headaches, sleep disorders, edema (shins, eyelids, fingers), cardialgia etc., morphophysiological indices, measurement of blood pressure, ambulatory blood

pressure monitoring, measurement of heart rate. Blood sampling for biochemical and hormonal research was conducted in the time interval from 8.00 to 11.00 am on empty stomach. The biochemical study included: full blood count (FBC), lipid profile, hepatic enzymes, creatinine, glycohemoglobin. The hormonal examination provided for the determination of total testosterone, estradiol, luteinizing hormone, follicle-stimulating hormone, prolactin.

**Results:** As a result of the study, it was found that 51% of patients took progestin-active drugs, 49% - without progestin activity. Arterial hypertension was observed in 27 (61%) patients, with the first degree of arterial hypertension observed in 20% of patients, the second degree in 27%, and the third degree in 14%. Also, edema was observed in 18 (61%) patients and sleep disorders was observed in 18 (61%) patients. A positive relation was found between taking drugs with progestin activity and a high (2-3) degree of arterial hypertension (Chi-square 29.5,  $p$ -value  $<0.000002$ ).

**Discussion:** The use of any drug leading to an increase in blood pressure should be accompanied by a study of its effect on the current cardiovascular pathology and the frequency of its development. All these medicines should be considered as additional factors of cardiovascular risk. As a result of our study a positive correlation was obtained between the medications with progestin anabolic effect and development of arterial hypertension in the examined patients (Chi-square: 29.5,  $p < 0.001$ ).

**Conclusions:** The use of anabolic drugs with progestin activity is associated with a risk of hypertension which, in combination with high packed cell volume and dyslipidemia, increases the risk of cardiovascular disease in this group of patients.