

Hypertensive disorders of pregnancy (HDP) remain one of the leading causes of maternal and perinatal morbidity and mortality worldwide. Pregnant women with HDP, regardless of the presence of traditional cardiovascular risk factors, have an increased risk of cardiovascular disease in the future after pregnancy. Gestational endotheliopathy (GE) involves insufficient generation of molecules, such as nitric oxide (NO), which is one of the main vasoactive mediators of the endothelium. In recent years, various methods of preventing GE have been developed and continue to be improved, but the problem is far from being solved. Preventive diagnostic procedures of maternal hemodynamics, especially before the clinical manifestation of perinatal pathology, can significantly improve perinatal outcomes endotheliotropic genesis. Multicenteral description of “hemodynamic model” of the examined conditions (not pregnant and pregnant women) was made basis on antropophysiological research of the circulatory state of the CVS, using the diagnostic system AN-TROPOS-CAVASCREEN, which is an innovative diagnostic complex for analyzing the performance of various blood circulation sections using noninvasive methods (thoracic and regional tetrapolar rheography, electrocardiography, BP measurement, electrometrical features of skin).

According to basic criteria and syndromal analysis of multicenteral complex of hemodynamic characteristics of the “hemodynamic model” of providing of pregnancy was held special antropophysiological analysis of showing up (part in % on a selection) of the different modes is conducted on middle blood pressure (Bpm) — hypo-, normo- and hypertensive on positions of body upright and lying.

Our results clearly demonstrate the value of the state of heart in this system maternal hemodynamic adjusting to pressor orientation, especially in position upright. The pregnant women those who have hemodynamically identified as nonoptimal hemodynamic supply of pregnancy, as a rule, perfusion type, in position upright marked more expressed (red blocks), as compared to the states without vasoconstriction (green blocks). By grey color marked blocks of circulation of blood, on which distinctions are absent. Optimization of the circulatory state of CVS during pregnancy by the regime of blood pressure, especially with normal pregnancy, was accompanied by a clear overall increase in systolic characteristics of the maternal hemodynamics. This orientation in the cardiac minute volume (CMV, ml) unambiguously manifested itself during all three trimesters as with normal pregnancy—lying and standing in total according to 24 characteristics out of 24 ($P < 0.01$), while with gestational endotheliopathy—by 18 out of 24 ($P < 0.05$).

Conclusion: For estimating the circulatory state of maternal hemodynamic for pregnant, and nonpregnant, necessary to be oriented not on the mode of BP, but on condition of basic perfusion mechanisms a “volume of blood—pumping function of heart—vascular capacity—blood stream” and regulators of autonomic regional blood flow—endothelial function providing distribution of peripheral circulation of blood in lying and upright positions.

(Section Methodology)

11. THE FEATURES OF THE PREVENTION OF PREECLAMPSIA IN PREGNANT WOMEN WITH GESTATIONAL ENDOTHELIOPATHY IN THE FIRST TRIMESTER

Prof. Oxana Taran National Pirogov Memorial Medical University, Vinnytsya, Ukraine

Prof. Dmytro Konkov National Pirogov Memorial Medical University, Vinnytsya, Ukraine

Associate professor Vitaliy Klivak National Pirogov Memorial Medical University, Vinnytsya, Ukraine

Assistant professor Olha Muntian National Pirogov Memorial Medical University, Vinnytsya, Ukraine

Low-dose aspirin (ASA) has been used during pregnancy, most commonly to prevent or delay the onset of preeclampsia. The Ukrainian National clinical guideline (2022) recommending daily 100-150mg from 12 weeks of gestation and continued until 35-36 weeks for women with highest risk development of preeclampsia. Most of the endotheliotropic drugs are either not recommended during pregnancy due to a lack of reliable data about the absence of teratogenic and embryotoxic effects (resveratrol, meldonium), or are only undergoing clinical trials (statins proton pump inhibitors, metformin), or raise concerns about a possible link between prenatal exposure and neonatal death from pulmonary hypertension (sildenafil). In addition, all of the above drugs have a stimulating effect on the endothelium, which leads to the production of NO, but also to endothelial depletion. Therefore, it is very important to use a NO precursor from which the endothelium can synthesize the necessary substances. Thus, there is a need for a class of endotheliotropic agents that not only stimulate the endothelium to produce NO but also supply the substrate. The only substance that is a substrate for NO synthesis is L-arginine.

The objective: to evaluate the clinical effectiveness of L-arginine in the prevention of preeclampsia and reduction of other perinatal risks in patients with preclinical gestational endotheliopathy (GE). Women with GE in subgroup A received ASA per os at a dose of 75 mg per day ($n=31$), in subgroup B they received L-arginine per os at a dose of 4-4.2 g per day ($n=33$), and women with GE who refused prophylactic treatment were included in subgroup C ($n=52$). Prophylactic treatment with L-arginine was carried out in a course regimen. The first course was prescribed from 12 to 14 weeks, the second course - from 16 to 18 weeks, and the third course - from 28 to 30 weeks of pregnancy. The clinical effectiveness of the therapy was assessed by comparing the number of cases of perinatal pathology in the I, II and III trimesters (threatening miscarriage, preeclampsia, placental dysfunction, perinatal losses).

The early administration of ASA and L-arginine to pregnant women with a moderate degree of perinatal risk (preconceptional GE) allowed not only to prolong pregnancy but also to reliably prevent the development of preeclampsia (RR 0.39, 95% CI: 0.18–0.84; $p=0.02$).

The more pronounced clinical efficacy of a course of L-arginine drinking solution (daily dose of L-arginine - 4.0-4.2 g) in pregnant women with pre-eclampsia may be associated with the endotheliotropic protective effect of the drug - a decrease in the number of preeclampsia cases (RR 0.19, 95% CI: 0.05-0.77; $p=0.02$) and placental hyperplasia/hypoplasia (RR 0.17, 95% CI: 0.04-0.68; $p=0.01$) compared with pregnant women who were diagnosed with GE and did not receive prophylactic therapy.

The prophylactic use of L-arginine in clinical practice during pregnancy is still under discussion, and more researches are needed to determine the optimal dose, initiation and duration of use for the best preventive or therapeutic effect.

(Section HDP-Preeclampsia)