

HYPERTENSION AND PREECLAMPSIA: CLINICAL AND PATHOGENETIC RELATIONSHIPS.

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Abstract

Hypertension (HT) and preeclampsia (PE) are common pathological conditions characterized by elevated blood pressure and target organ damage. The aim of this study was to examine the relationship between chronic hypertension and the development of preeclampsia in pregnant women.

An analysis of literature data and clinical observations of 120 pregnant women with various forms of hypertension was conducted. It was found that hypertension increases the risk of developing preeclampsia by 3-4 times.

The main pathogenetic mechanisms are endothelial dysfunction, impaired placental perfusion and systemic inflammatory response.

Key words: hypertension, arterial hypertension, pregnancy, preeclampsia, endothelial dysfunction, placental insufficiency.

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Аннотация

Гипертоническая болезнь (ГБ) и преэклампсия (ПЭ) являются распространёнными патологическими состояниями, сопровождающимися повышением артериального давления и поражением органов-мишеней. Целью работы явилось изучение взаимосвязи между хронической артериальной гипертензией и развитием преэклампсии у беременных женщин. Проведён анализ литературных данных и клинических наблюдений за 120 беременными с различными формами гипертензии. Установлено, что наличие гипертонической болезни повышает риск развития преэклампсии в 3–4 раза. Основными патогенетическими механизмами являются эндотелиальная дисфункция, нарушение плацентарной перфузии и системный воспалительный ответ.

Ключевые слова: гипертоническая болезнь, артериальная гипертензия, беременность, преэклампсия, эндотелиальная дисфункция, плацентарная недостаточность.

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Annatatsiya

Gipertenziya (HT) va preeklampsi (PE) qon bosimi ortishi va maqsadli organlarning shikastlanishi bilan birga keladigan keng tarqalgan patologik holatlardir. Ishning maqsadi surunkali arterial gipertenziya va homilador ayollarda preeklampsi rivojlanishi o'rtasidagi bog'liqlikni o'rganish edi. Gipertenziyaning turli shakllari bilan og'rigan 120 homilador ayolning adabiyot ma'lumotlari va klinik kuzatuvlari tahlili o'tkazildi. Gipertenziya preeklampsi rivojlanish xavfini 3-4 barobar oshirishi aniqlandi. Asosiy patogenetik mexanizmlar - endotelial disfunktsiya, platsenta perfuziyasining buzilishi va tizimli yallig'lanish reaksiyasi.

Kalit so'zlar: gipertoniya, arterial gipertenziya, homiladorlik, preeklampsi, endotelial disfunktsiya, platsenta etishmovchiligi.

Introduction

Hypertension (essential hypertension) is a chronic disease characterized by persistently elevated blood pressure and target organ damage. According to the World Health Organization (WHO), hypertension occurs in 20–30% of the adult population and 5–10% of pregnant women.

Preeclampsia is a specific complication of pregnancy that occurs after the 20th week of gestation and is characterized by arterial hypertension, proteinuria and multiple organ dysfunction.

Although the pathogenesis of preeclampsia differs from that of classical hypertension, both conditions have similar components: endothelial dysfunction, vasospasm, and microcirculation disorders.

The aim of this study was to determine the clinical and pathogenetic relationships between hypertension and preeclampsia, and to assess the impact of baseline hypertension on pregnancy and perinatal outcomes.

Research Materials and Methods

The study was conducted at a provisional obstetrics department. The study included 120 pregnant women, followed from 12 to 40 weeks of gestation.

Observation groups:

- Group I (main) — 60 women with hypertension stages I–II;
- Group II (control) — 60 apparently healthy pregnant women without hypertension.

Exclusion criteria were: chronic kidney disease, diabetes mellitus, systemic connective tissue diseases, multiple pregnancy.

Methods:

1. Clinical examination: blood pressure measurement, weight monitoring, edema assessment.
2. Laboratory tests: determination of proteinuria, creatinine, uric acid levels, and liver enzyme activity.
3. Instrumental methods: ultrasound examination, Doppler ultrasound of uteroplacental blood flow.
4. Statistical analysis: data were analyzed using SPSS 26.0. Results are presented as mean \pm standard deviation, significance level $p < 0.05$.

Study Results

Of the 60 women with hypertension, preeclampsia developed in 24 (40%), compared to only 6 (10%) in the control group ($p < 0.01$). The average blood pressure in patients with preeclampsia was 155/100 mmHg, significantly higher than in pregnant women with isolated hypertension without complications (138/88 mmHg).

When analyzing biochemical parameters, an increase in the level of uric acid (on average 480 ± 60 $\mu\text{mol/l}$ versus 310 ± 45 $\mu\text{mol/l}$, $p < 0.05$) and AST/ALT activity was revealed, which indicates the involvement of the liver in the pathological process.

According to Doppler data, an increase in the resistance index in the uterine arteries was noted (0.76 ± 0.05 versus 0.64 ± 0.03 , $p < 0.05$), which indicates a violation of placental blood flow.

In newborns born to mothers with a combination of hypertension and PE, signs of intrauterine growth retardation (in 28% of cases) and low birth weight (< 2500 g - in 22% of children) were noted.

Discussion

These findings confirm that hypertension is a significant risk factor for the development of preeclampsia. Chronic hypertension creates the preconditions for a decrease in the adaptive capacity of a pregnant woman's vascular system.

Pathogenetically, both conditions are united by endothelial dysfunction, accompanied by a disruption in the production of vasoactive substances (NO, endothelin, prostacyclin), platelet activation and increased vascular permeability.

Impaired trophoblast invasion during placenta formation leads to hypoperfusion and ischemia, in response to which antiangiogenic factors (sFlt-1, endogelin-1) are released, aggravating systemic vasospasm.

Thus, preeclampsia in patients with hypertension is more severe, accompanied by severe proteinuria, nephropathy and deterioration of fetoplacental blood flow.

Conclusions

1. Hypertension increases the risk of developing preeclampsia by 3-4 times compared to healthy pregnant women.
2. Common pathogenic mechanisms of the two conditions include endothelial dysfunction, systemic vasospasm, and impaired placental perfusion.
3. Patients with a combination of hypertension and PE are more likely to experience adverse perinatal outcomes, including fetal growth restriction and neonatal malnutrition.
4. To reduce the risk of complications, it is necessary to detect hypertension early, be monitored by a cardiologist, and prescribe preventive measures (low doses of aspirin, weight control, and normalizing lifestyle).

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