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Research Article

Hypertensive Disorders During Pregnancy: A Retrospective Study

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Abstract

The aim of the study is to evaluate hypertensive disorders during pregnancy and perinatal outcomes. A retrospective analysis of data from 69 pregnant women divided into three groups is presented: control (without hypertension), with gestational hypertension, and chronic hypertension. Blood pressure, pulse, and neonatal parameters (weight, height, and Apgar scale) were assessed. The results showed that pregnant women with hypertension had a significant increase in systolic and diastolic blood pressure compared to the control group. In the group with gestational hypertension, a decrease in the weight and height of newborns was found, indicating a negative effect of hypertension on fetoplacental blood flow. In chronic arterial hypertension, an increase in blood pressure was observed, but neonatal parameters remained at the level of the control group. The data obtained confirm the clinical basis for early diagnosis and timely treatment of hypertensive disorders in pregnant women in order to reduce the risk of adverse perinatal outcomes.

Keywords: pregnancy, hypertension, gestational hypertension, chronic hypertension, perinatal outcomes

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1. Introduction

One of the main causes of maternal and perinatal morbidity and mortality globally is hypertensive disorders during pregnancy (HD) [1, 2]. These conditions occur in 5-10% of all pregnant women and include chronic arterial hypertension, gestational hypertension, and preeclampsia [3]. The most adverse effects on the mother and fetus are observed in preeclampsia, which can be complicated by eclampsia, HELLP (Hemolysis, Elevated Liver enzymes and Low Platelets) syndrome, premature birth, and fetal developmental disorders [4]. Despite advances in diagnosis and treatment, the issues of early detection of PGD, predicting their outcomes, and choosing optimal pregnancy management tactics remain relevant. In practice, gestational hypertension and preeclampsia are often diagnosed at a late stage, which limits the possibilities of preventing complications. According to literature data, hypertensive disorders increase the risk of intrauterine growth retardation, fetal malnutrition, low Apgar scores, and increase the frequency of neonatal hospitalizations in intensive care units [1, 3, 4, 5-7]. The purpose of this study is to analyze, using our own clinical material, its effects on newborns and to determine the significance of early detection of adverse outcomes.

2. Materials and methods

2.1. Research design

A clinical, descriptive, a retrospective analysis of medical records of 69 pregnant women who gave birth at the Department for women in labor and postpartum women with high risk of somatic and perinatal pathology Aktobe Medical Center, in Aktobe of Kazakhstan, from 2022 to 2024, it was carried out. The study was carried out in compliance with the Declaration of Helsinki's ethical guidelines at the request of the Marat Ospanov West Kazakhstan Medical University's local Bioethics Committee (protocol No. 22 as of April, 9; 2019). Pregnant women are collected based on this protocol.

Three groups (23 patients each) were formed: a control group (without arterial hypertension), with gestational hypertension, and with chronic arterial hypertension. Blood pressure (systolic and diastolic), pulse, weight and height of the newborn, as well as the Apgar score were assessed.

2.2. Statistical Analysis

The results were analyzed using M±SD methods, nonparametric statistics using the Mann-Whitney test (significant $p < 0.05$).

3. Results

A comparative analysis of medical and perinatal parameters in the control group and groups with hypertension is presented in Table **1**. The age and duration of pregnancy did not differ between the results. Groups 1 and 2 showed substantial increases in systolic and diastolic blood pressure compared to the control ($p < 0.05$). Patients in group 2 had more pronounced bradycardia, possibly as hypertension progressed (Figure **1**). In group 1, the measured values of the weight and length of newborns were significantly lower. The Apgar score remained within the normal range on average, but was reduced in group 1.

Table 1: Clinical and perinatal parameters in control groups.

Indicator	Control group (n = 23)	Group 1 (n = 23) Gestational hypertension	Group 2 (n = 23) Chronic hypertension
Age, years	28 (24–35)	28 (25–33)	28 (25–34)
Gestational age, weeks	39 (38–40)	39 (38–40)	39 (38–40)
Systolic BP, mmHg	120 ± 5.6	150 ± 8.34 *	142.29 ± 5.1 *
Diastolic BP, mmHg	75 ± 4.8	95.6 ± 8.43 *	90.41 ± 2.04 *
Pulse, bpm	76 (70–82)	78 (72–80)	67 (62–75)
Newborn length, cm	51 ± 3.2	43 ± 8.7 *	52.62 ± 4.72
Newborn weight, g	3310 ± 520	2949 ± 1187.6 *	3407.79 ± 689.58
APGAR score	9.3 (9–10)	8.9 ± 1.2	9.43 ± 0.72

* — Statistically significant difference compared to the control group ($p < 0.05$)

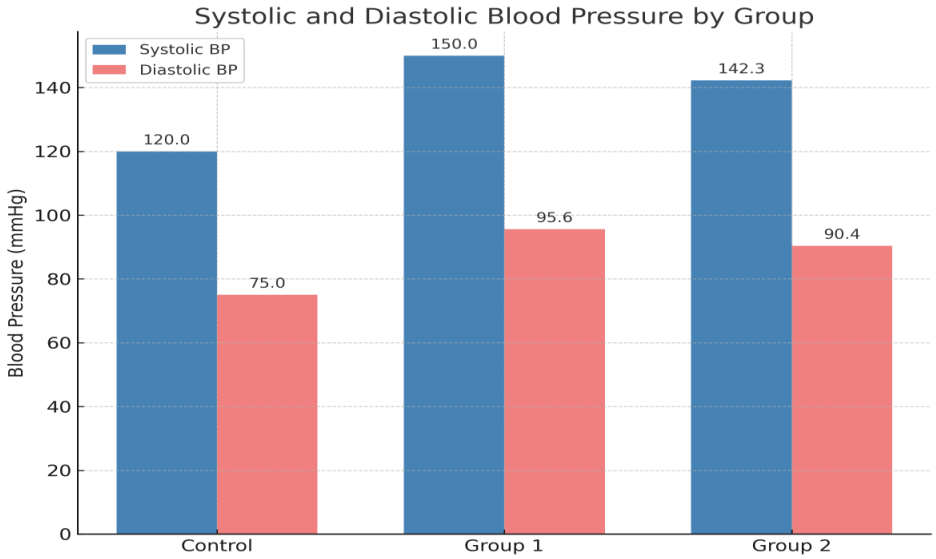

Figure 1: Blood pressure by groups.

The findings confirm the negative impact of arterial hypertension during pregnancy on perinatal outcomes. Elevated blood pressure is associated with impaired growth and weight of the newborn, as well as lower Apgar score (Figure **2**). The most pronounced impairments were observed in the first

group, which may indicate a higher blood pressure level than in the second group. In the second group with chronic arterial hypertension, probably those who receive timely antihypertensive therapy adapted (Table **1**).

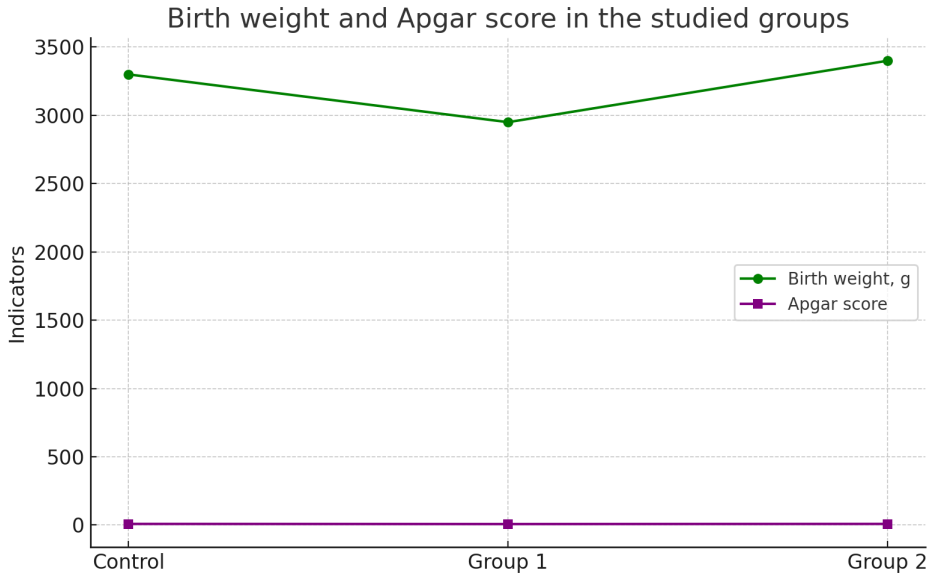

Figure 2: The child's weight and Apgar score.

4. Discussion

Our results confirm the critical role of hypertensive disorders of pregnancy (HDP) in worsening perinatal outcomes, which is consistent with several recent publications. For example, Di Martino et al. (2022) [8] showed an association between HDP, fetal growth restriction, and placental abnormalities. Studies in a multicenter cohort of extremely preterm infants also demonstrated worse neonatal outcomes in HDP. The statistically significant increase in systolic and diastolic blood pressure supports the findings of the American heart association (AHA) scientific statement (2022) [9], which outline clear treatment criteria and courses of antihypertensive therapy. The analysis of Khalil et al. and Reddy et al. (2022) [10] confirmed the prognostic value of hemodynamic and placental parameters in HDP. Our data show reduced neonatal weight and height in the gestational hypertension group. This is consistent with the results of a systematic review by Wang and Xiao (2023) [11] demonstrating the impact of hyperglycemia and hypertension on the blood pressure of the child after birth. In addition, an analysis of Biomed Centre (BMC) of in vitro fertilization (IVF) pregnancies by Dai et al. (2023) [12] revealed similar trends - an increased risk of severe preeclampsia and intrauterine growth retardation. Of interest is the maintenance of adequate growth parameters in newborns with chronic hypertension. This may be a consequence of timely pregnancy management indicated in the systematic reviews by Paul et al. [9]. Global trends demonstrate an increase in chronic hypertension in pregnant women. For example, United States (US)

statistics showed a doubling of its prevalence from 2008 to 2021 - from 1.8% to 3.7%, with only 60% of patients receiving antihypertensive therapy [13]. These data highlight the need for a multidisciplinary model of care - an obstetrician-gynecologist, a therapist and a neonatologist - especially in resource-limited settings. Early diagnosis, use of lethal strategies (low-dose aspirin prophylaxis, antihypertensive drugs, monitoring of placental biomarkers) [14, 15] and timing of delivery can significantly improve perinatal outcomes.

5. Conclusion

Hypertensive disorders during pregnancy are accompanied by an increase in blood pressure and negatively affect the growth and body weight of newborns. Early diagnosis and correction of hypertension can improve perinatal outcomes.

Acknowledgements

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Conflict of Interest

Each author has no conflict of interest related to the presented article. Artificial intelligence (AI) has not been used and data from our own research is provided.

Ethical Statement

Ethical Committee of the West Kazakhstan Marat Ospanov Medical University has considered and approved the presented research as conducted in Ethical principles (protocol No. 22 as of April, 9; 2019).

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