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An analysis of perinatal outcomes in pregnant women with arterial hypertension in Poland and Ukraine during times of conflict

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Hypertensive problems are present in 10% of all pregnancies. Hypertensive disorders in pregnancy constitute one of the reasonsfor maternal death and perinatal too in the world.Women with hypertension are always at higher risk for preterm birth than women without disorder. The article is dedicated to analyzing pregnancy and its consequences, including perinatal outcomes, in women with arterial hypertension. The analysis was conducted at two powerful medical centers — the Princess Anna maternity hospital in city Warsaw, Poland, and the KNP KMPB No. 5 in city Kyiv, Ukraine. The prolonged war in Ukraine has complicated the timely diagnosis and proper treatment of pathological conditions. To assess this problem, two groups were created: control and experimental, and a total of 366 pregnant patients were studied. In Warsaw, 206 patients were analyzed, while in the Kyiv maternity hospital, 160 patients were analyzed. During the analysis, one of the conclusions drawn was that chronic hypertension during pregnancy is strongly associated with pregnancy complications and negatively affected by other complicating factors such as maternal age, previous pregnancy complications, and obesity.

Separate groups were identified and calculated for complications in each center separately. The degree of depression among pregnant women undergoing examination was also taken into account, and those who needed help from specialists were referred to psychologists.

The authors declare no conflicts of interest.

Keywords: hypertension, chronic hypertension, blood pressure, hypertensive disorders, preeclampsia, chronic hypertension, gestational hypertension, depression, perinatal outcomes.

Аналіз перинатальних результатів у вагітних з артеріальною гіпертензією в Польщі та Україні під час конфлікту

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Гіпертонічні розлади зустрічаються у 10% всіх вагітностей і є однією з причин материнської та перинатальної смертності у світі. Жінки з гіпертонією завжди мають більший ризик передчасних пологів, ніж жінки без даної патології. Стаття присвячена аналізу вагітності та її наслідків, у тому числі перинатальних результатів, у жінок з артеріальною гіпертензією. Аналіз проводився у двох потужних медичних центрах –Госпіталі Принцеси Анни у м. Варшава, Польща, та КНП «Київський міський пологовий будинок» № 5 у м. Києві, Україна. Війна в Україні, що триває ускладнює своєчасну діагностику та належне лікування патологічних станів. Для оцінки цієї проблеми було створено дві групи: контрольну та досліджувану, всього обстежено 366 вагітних. У Варшаві проаналізовано 206 пацієнток, а в Київському пологовому будинку – 160 пацієнток. Під час аналізу було зроблено один із висновків, що хронічна гіпертензія під час вагітності тісно пов'язана з ускладненнями та негативно впливає на результат вагітності разом з інші ускладнюючими фактори, такими як вік матері, попередні ускладнення та надмірна вага тіла.

Окремі групи були розраховані за ускладненнями в кожному центрі окремо. Також враховувався ступінь депресії вагітних, які взяли участь в аналізі, а тих, хто потребував допомоги спеціалістів — направляли до психологів.

Автори заявляють про відсутність конфлікту інтересів.

Ключові слова:гіпертензія, хронічна артеріальна гіпертензія, артеріальний тиск, гіпертензивні порушення, прееклампсія, хронічна гіпертензія, гестаційна гіпертензія, депресія, перинатальні результати.

Introduction

Hypertensive disorders in pregnancy constitute one of the reasonsfor maternal deathand perinatal too in the world.Hypertensive problems are present in 10% of all pregnancies. The preeclampsia can complicateabout 8% of all pregnancies worldwide such statistics in recent years [1].

Based on available data, chronic hypertension during pregnancy is a significant risk factor for adverse maternal and fetal outcomes, the incidence of hypertension during pregnancy is like global rates, ranging from 3–10% of pregnancies [2].

Complications associated with hypertension during pregnancy can include pre-eclampsia, gestational diabetes, preterm birth, and low birth weight. These complications are often exacerbated by the presence of other complicating factors such as maternal age, history of previous pregnancy complications, and obesity.

In addition, the ongoing war in Ukraine may have further negative impacts on maternal and fetal outcomes, as stress and trauma can increase the risk of hypertension and other complications during pregnancy.

The number of women who will have hypertension leading causes that play a role in increasing the blood pressure of a pregnant woman remains obesity, as well as the age of the pregnant woman at which she enters pregnancy [3].

Depression is a fairly common occurrence in pregnant women. According to research, approximately one in five pregnant women experience symptoms of depression during pregnancy [28].

It is also worth noting that women with a high risk of developing depression, such as those with a previous history of depression, may have a higher risk.

Near 5% of all pregnant women have chronic hypertension and have some previous problems with high blood pressure [4].

Depression can have a negative impact on arterial hypertension during pregnancy, increasing the risk of complications for both. For example, research shows that pregnant women with depression often have higher blood pressure and an increased risk of developing pre-eclampsia, gestational diabetes, and low birth weight [26].

Moreover, depression can lead to a decrease in quality of life and social support, which can also worsen the health of pregnant women. Therefore, it is important to pay attention to the mental health of pregnant women and provide them with support and treatment if necessary [27].

Definition/diagnostic criteria. Hypertensive disorders during pregnancy can be classified into 4 categories (recommended by the National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy):

- preeclampsia/eclampsia;
- chronic hypertension;
- gestational hypertensive disorders;
- preeclampsia superimposed [5];

Chronic hypertension as high blood pressure before pregnancy itself or detected at 20–24 weeks or within 12 weeks after childbirth. Gestational hypertension is defined asa systolic pressure 140 mm/Hg or more or a diastolic pressure of 90 mm/Hg or even more, or both, two episodesat last 4 hours after 20 weeks of pregnancy, in a woman with a previous normal blood pressure [16].

The most common complications that occur in women with blood pressure disorders are preterm birth (delivery before 37 weeks),preeclampsia superimposed on chronic hypertension with new onset of organ damage with or without protein in urine orplacental abruption,small for gestational age [6].

Risk/outcomes of hypertension in pregnancy. Women with hypertension are always at higher risk for preterm birth than women without disorder. Preterm births among women with hypertension are mostly medically indicated ‘cause these women are at most higher risk for preeclampsia also. The risk of preeclampsia is 25% in women with chronic disorders compared 5% in women without hypertension problem before [7].

Some complications may be associated with placental abruption, this is happening around 10% of preterm birth and 10–20% of perinatal deaths [8].

Chronic hypertension has a great negative impact on the life of a pregnant woman, as well as on the life of fetus and a child after childbirth. Disorder remains one of the leading causes of maternal and child mortality worldwide with 12% of maternal deaths annually resulting from maternal complications [9].

The number of pregnant women with chronic hypertension is elevation because of the grooving of risk factors such as obesity, maternal ageand diabetes [10].

Depression during pregnancy is a common problem in many other countries. A study conducted in 2020 found that approximately 15% of pregnant women in Poland experienced symptoms of depression. Factors that have been associated with an increased risk of depression during pregnancy in Poland include a history of depression, a lack of social support, and experiencing stressful life events [25].

It’s important to note that depression during pregnancy can have negative effects on both the mother and the baby. Untreated depression during pregnancy has been linked to a higher risk of preterm birth, low birth weight, and developmental delays in the child [24].

Depression during pregnancy is a serious problem in Ukraine, with up to 19% of pregnant women experiencing it, likely due to various factors such as stress and social isolation, as well as existing socio-economic issues. As of September 2021, depression was already a common problem in the country, particularly in the context of the ongoing war in the east and other socio-economic challenges faced by the population [22–23].

Near 50% of all pregnant women will develop proteinuria or other target organ damage as a resultconsistent with the preeclampsiathis most often accompanies when the hypertension is diagnosed before 32 weeks [16].

Compared to women without chronic hypertension disorders and women with chronic hypertension have near t are twice as likely the risk of having some complications during pregnancy [11].

It is also worth sincehypertension in pregnancy significantly increase the risk of cardiovascular

Table 1

Risks of complications of arterial hypertension

Maternal risks	Fetal risks
Severe hypertension	Growth small for gestation
Preeclampsia	Preterm delivery
Abruption	Congenital anomalies
Cesarian delivery	Stillbirth
Postpartum hemorrhage	Neonatal death
Renal insufficiency/failure	
Stroke	
Myocardium infarction	
Pulmonary edema	

Table 2

The most commonly occurring complications of hypertensive disorders.

Warsaw hospital	Kyiv hospital
Severe hypertension (32%)	Preeclampsia (28%)
Growth small for gestation (25%)	Cesarian delivery (27%)
Preterm delivery (23%)	Growth small for gestation (25%)
Pathological delivery (20%)	Preterm delivery (20%)

diseasein the future in a woman's life, regardless of the outcome of pregnancy [12].

Pregnancy on the background of hypertension is the reason for requiring early prenatal care because chronic hypertensionleads to adverse pregnancy outcome [13].

Prenatal care is a key link in reducing complicationsand adviceone of the most important preventive public health measures used globally [14–15].

However, it is always better to control the condition as much as possible than to suddenly deal with complicationsthe lack of evidence on the effects of prenatal care on women with chronic HTN presents a significant challenge for effective management of maternal risk factors before and during pregnancy.Purpose of the articlewas to conduct a systematic review on the effects of chronic hypertension in pregnancy and prenatal care on maternal and infant outcomes [16].

Higher risk of complications in women with:

- secondary hypertension;
- age more then 35 y.o.;
- blood pressure more 160/110 mm Hg in the I trim.
- hypertension during of 5 or more years.
- hypertension treated with 2 or more drugs.
- history of previous obstetric complications,
- chronic cardiovascular diseases [13].

Special attention should be paid to patients up to 20 weeks of pregnancy with increased pressure them should be recommended consultationby a cardiologist or general practitioner [1,14].

The most common complications observed during analysis, which are the development of preeclampsia, low birth weight infants, preterm delivery, and pathological emergencies during childbirth.

Low birth weight infants are at higher risk of health problems such as infections, breathing difficulties, and developmental delays.

Premature babies may face a range of health challenges, including respiratory distress syndrome, feeding difficulties, and increased risk of infections.

he most common complications were identified (Table 2).

Overall, these complications can have significant impacts on the health and well-being of both mother and baby. Close monitoring and timely intervention can help to reduce the risk and severity of these complications during pregnancy and childbirth.

Treatment. The treating of severe hypertension isalso needed to prevent congestive ischemia of myocard, heart failure,renal failure / injury, and stroke. Antihypertensive treatment should be initiated patient for acute-onset severe hypertension.The ACOG Practice Bulletins recommends the use of drugs as the first that methyldopa and labetalol are beta-blockers, and angiotensin-converting enzyme inhibitors are not recommended this patient [17].

Methyldopa is a centrally acting α_2-adrenergic receptor agonist. It inhibits vasoconstriction via a central mechanism by reducing catecholamine release [18]. Methyldopa has a record of safety

in pregnancy, as established by follow-up studies in the 1980's of children exposed to the drug in utero [19].

Dosage 250 mg 2–3 times a day (max daily dose of 3 g). FDA class B, proven safetyand efficacy and compatible with breastmilk that is important after delivery [20].

This review will address the management of hypertension in pregnancy, treatment regimens for arterial hypertension in pregnant women, the timing of the manifestation of hypertensive disorders and the timing of delivery as a result.

Labetalol is used with or without other medications to treat high blood pressure (hypertension). Lowering high blood pressure helps prevent strokes, heart attacks, and kidney problems.This medication is beta-blocker with alpha bloking activity, it works by blocking the action of certain natural chemicals in your body such as epinephrine on the heart and blood vessels. This effect lowers the heart rate, blood pressure, and strain on the heart [29].

ACOG guidance uses «an initial regimen of labetalol at 200 mg orally every 12 hours and increase the dose up to 800 mg orally every 8–12 hours as needed (maximum total 2,400 mg/d)» [30–31].

Analysis

The Princess Anne Maternity Hospital in Warsaw conducted an analysis of pregnant women with various hypertensive disorders during pregnancy. Out of these, 76 patients had their first episode of increased pressure during the 20–24th week of pregnancy, while 27 patients had experienced such problems in their previous pregnancies and had undergone therapy. A control group of 103 healthy pregnant women was also established. The analysis showed that there were 19 cases of preterm birth in the main group, while the ratio of pathological births and uncomplicated births among full-term fetuses was 71 and 13, respectively. The most common complications in the presence of chronic hypertension in the mother were identified as preeclampsia superimposed on chronic hypertension, placental abruption, preterm birth, and small for gestational age infants.

The assessment of the outcome of childbirth gave significant results, and it was concluded that the number of pathological outcomes was significantly higher in the main group than in the control group (p=0.000032).

In addition, the study showed that there was a relationship between the presence of complications and the course of pregnancy complicated by hypertension.

The outcome assessment results based on data from Kiev Maternity Hospital No. 5 were not different from those obtained from Warsaw Maternity Hospital. During the same period, a total of 80 patients were evaluated, with approximately 40 suffering from hypertensive disorders since the 2nd trimester of pregnancy, and the rest closer to the date of delivery. The main group was evaluated, and among the 80 pregnant women, there were 21 pathological deliveries that required the use of a vacuum extractor to reduce the second stage of labor, either due to fetal distress or due to caesarean section.

The study included a control group of women who did not have any pre-existing blood pressure problems or incidents of increased blood pressure before or during childbirth. In this group, there were 8 cases of preterm birth, with 6 by caesarean section and 2 by vaginal delivery. Additionally, 38 full-term deliveries were completed by caesarean section, and 7 were vaginal deliveries. It should also be noted that the number of premature births before 37 weeks was higher in the main group (p=0.007356).

The study group included first-time mothers, as well mothers who had given birth two or more times. The average age of the women did not differ significantly from the main group and was 32/33 years compared to 35/31.

Based on a statistical analysis of the cases, it can be concluded that there is a relationship between the presence of complications such as premature birth, premature babies according to their gestational age, and the term of delivery, in cases of pregnancy complicated by hypertension (p=0.008349). The delivery date directly depended on the condition of the pregnant woman. Comparison of the groups yielded statistically significant data on the dependence of newborn weight (p=0.008349) and Apgar scores, which were in the average range of 5/6 to 6/7 due to complications in preterm birth in the main groupin two clinics respectively

A control group of patients without any complaints or pressure problems during and before pregnancy was also established.

The statistical assessment of delivery outcomes showed a higher risk of complications in the main group than in the control group, which confirmed global statistics.

The estimated number of births did not show a significant difference between the two groups, but if the results were assessed, they were

Table 3

Overall table of results of analysis of two maternity hospitals

Parameters	Hospital in Warsaw	Kyiv maternity hospital No. 5
Were analyzed	206	160
Hypertensive disorders during pregnancy	76 (36%)	40(25%)
Preterm births	27(13%)	16(10%)
Pathological births	65(31%)	42(26.5%)
Apgar score in pathologicallabor	5/6	6/7
Age of women	32(15.5%)	33 (20%)
Depression	30(14%)	32 (20%)

statistically significant (p=0.008448). It should also be noted that the number of premature births before 37 weeks was higher in the main group (p=0.007356).

The type of delivery among preterm births was not found to be statistically significant or dependent on the outcome of pregnancy (p=0.221683), as calculated in the Warsaw medical institution. If the weight of the fetus in the two groups is evaluated, there is a clear dependence, and in the main group, this is significantly statistically significant, since the number of preterm births was higher than in the control group (p=0.000107).

Depression during pregnancy is a common problem in Poland, as it is in many other countries. A study conducted in 2020 found that approximately 15% of pregnant women in Poland experienced symptoms of depression. Factors that have been associated with an increased risk of depression during pregnancy in Poland include a history of depression, a lack of social support, and experiencing stressful life events [25].

It's important to note that depression during pregnancy can have negative effects on both the mother and the baby. Untreated depression during pregnancy has been linked to a higher risk of preterm birth, low birth weight, and developmental delays in the child [24].

Depression during pregnancy is a serious problem in Ukraine, with up to 19% of pregnant women experiencing it, likely due to various factors such as stress and social isolation, as well as existing socio-economic issues. As of September 2021, depression was already a common problem in the country, particularly in the context of the ongoing war in the east and other socio-economic challenges faced by the population [22–23].

Edinburgh Postnatal Depression Scale (EPDS) in screening for depression in pregnant women.

The EPDS is a self-reported questionnaire that consists of ten questions designed to identify symptoms of depression in women during and after pregnancy. It was developed specifically for use in postpartum women but has also been validated for use during pregnancy.

The EPDS has been shown to be an effective screening tool for depression in pregnant women, with high sensitivity and specificity in detecting depressive symptoms. It is a quick and easy-to-administer tool that can be used by healthcare providers to identify women who may need further evaluation and treatment for depression.

Overall, the use of the EPDS in screening for depression in pregnant women can help to improve the detection and management of depression in this population, leading to better outcomes for both mothers and their babies.

According to the depression questionnaire assessment, 20% of women in City Hospital No. 5 who gave birth suffer from depression. All their data has been provided to medical professionals competent in the field of mental health.

Addressing depression during pregnancy is an important issue in Ukraine that requires additional attention and resources. In response, efforts have been made to improve access to psychological care and treatment for patients with depression.

There are treatment options available for pregnant women with depression, including therapy and medication. However, it's important for pregnant women in Poland and Ukraineto seek the advice of a qualified healthcare provider before starting any treatment.

Conclusion

The study revealed that chronic hypertension during pregnancy is strongly associated with pregnancy complications and negatively impacted by other complicating factors such as maternal age, previous pregnancy complications, and obesity. Early prenatal care and controlling chronic diseases are crucial to prevent adverse maternal and infant birth outcomes associated with chronic hypertension. The analysis of two powerful medical maternity institutions in Polandand Ukraine did not show any significant differences, which aligns

with world and publicly available statistics. It is essential to recognize the relationship between complications and hypertension during pregnancy to provide appropria.

Early prenatal care and the effective management of chronic diseases such as hypertension are crucial in reducing adverse maternal and infant birth outcomes. It is important for healthcare providers to closely monitor patients with chronic hypertension during pregnancy and provide appropriate interventions as needed.

Of course, the quality of pressure correction and the quality of the selection of therapy and dosing in each individual case are important, as is the adherence to the recommendations by the patient herself.

Chronic hypertension and pregnancy complications are strongly associated. Both outcomes were affected negatively by the presence of other complicating factors such as maternal age, history of previous pregnancy complications, obesity. Risk of adverse birth outcome is higher for women with previous chronic hypertension, even without other pregnancy complications.

The incidence dependence by race/ethnicity and country of birthcontinued to increase and that adverse birth outcomes in women with chronic HTN were more common than in women without chronic hypertension [21].

Further, infants of women with hypertension disorders were more likely to be born through operative delivery (cesarean section) orinduction of labor and to stay longer from some days to weeks in the hospital than infants born to women without hypertension.

Further research is needed to fully understand the impact of the war on maternal and fetal health outcomes in Ukraine, as well as to identify effective interventions to improve outcomes in this population.

There is no conflict of interest.

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