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ANALYSIS OF THE INFLUENCE OF THERAPEUTIC TACTICS OF PREECLAMPSIA MANAGEMENT ON PERINATAL OUTCOMES

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Abstract
A retrospective cross-sectional study was conducted with the inclusion of women with preeclampsia. The perinatal outcome was assessed in newborns born after the 28th week of pregnancy and during the early neonatal period before discharge (< 7 days). The aim of the study was to evaluate the effect of preeclampsia treatment methods on perinatal outcomes. Perinatal mortality was high among women in labor with preeclampsia. According to our analysis, the most pronounced negative impact on perinatal outcomes is exerted by such variables as diastolic blood pressure and an Apgar score at the 5th minute.

Keywords: Moderate and severe preeclampsia, perinatal outcomes, stillbirth, Apgar scale.

Introduction

Preeclampsia is a serious complication of pregnancy that develops after the 20th week of pregnancy. Preeclampsia occurs in 2-8% of pregnancies, is one of the most important causes of maternal and perinatal morbidity and mortality, and has no downward trend. Maternal mortality is 12 times higher when developing preeclampsia before 28 weeks of pregnancy. [2].

Preeclampsia has long-term consequences for both mother and fetus. The danger of this complication is that it does not heal completely after the end of pregnancy. Women who have had preeclampsia have an increased risk of hypertension, diabetes, coronary heart disease, stroke, and even cancer [3]. In severe preeclampsia, fetal development is delayed and the course of the disease requires early delivery. Children born to mothers with preeclampsia are more prone to hypertension, strokes, diabetes, metabolic disorders, neurological and mental disorders [5].

Worldwide, almost 16% of the approximately 2.6 million stillbirths per year occur during pregnancy complicated by hypertension [7]. Hypertensive disorders during pregnancy are responsible for 10% of cases of early neonatal mortality (8 per 1,000 live births) and a significant proportion of cases of late neonatal mortality (3 per 1,000 live births) [4, 8]. Despite the fact that hypertensive disorders during pregnancy themselves affect the fetus and its survival after childbirth, the treatment methods used are also associated with perinatal mortality.

Studies have shown that insufficient and untimely initiation of treatment, as well as premature birth in women with preeclampsia, are associated with an unfavorable outcome for the fetus. Since different management methods are used in different institutions, it is necessary to study their impact on perinatal mortality [9-11].

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The purpose of the study – to evaluate the effects of preeclampsia treatment methods on perinatal outcomes.

Materials and Methods

A retrospective cross-sectional study was conducted with the inclusion of women with preeclampsia. The perinatal outcome was assessed in newborns born after the 28th week of pregnancy and during the early neonatal period before discharge (< 7 days). Since the aim of the study was to evaluate the effect of various preeclampsia treatment methods on perinatal mortality, such possible causes of perinatal mortality as maternal death at admission, during hospitalization and childbirth, as well as multiple pregnancies were excluded from consideration. In addition, patients with an extremely incomplete history of ART were excluded, as well as patients who were delivered upon admission to the hospital. The data were collected using a pre-tested checklist that assessed socio-demographic indicators, obstetric history, signs and symptoms at the time of treatment, laboratory results, and perinatal outcomes. The end result of the study was the perinatal outcome in women with preeclampsia, which was divided into two outcomes: the birth of a live child and the birth of a stillborn child. The independent variables were socio-demographic factors such as the age and place of residence of the patients; factors related to obstetrics; the duration of pregnancy (at the time of admission and delivery); prenatal monitoring of the current pregnancy; current medical history (concomitant diseases); condition at the time of admission, such as blood pressure measurement, proteinuria level, and also, signs and symptoms of target organ damage; treatment methods, including antihypertensive and anticonvulsant drugs, method of delivery; as well as other perinatal factors, such as fetal heartbeat during childbirth, Apgar score, and birth weight. The gestational age was considered reliable if it was calculated based on the last normal menstrual cycle or using obstetric ultrasound. Fetal heart rate below 100 beats per minute or above 160 beats per minute was classified as abnormal. We used the standard clinical classification of preeclampsia. Therefore, with an increase in blood pressure of more than 140/90 mmHg, but less than 160/110 mmHg with clinically significant proteinuria ≥ 0.3 g/l in a daily sample (24 hours) or in two samples taken with an interval of 6 hours; when using a test strip (protein in urine) - an indicator ≥ "1+", moderate preeclampsia was diagnosed; with an increase in blood pressure of more than 160/110 mmHg with clinically significant proteinuria or with symptoms of damage to target organs, severe preeclampsia was recorded. If women with preeclampsia had at least one of the following symptoms: headache, vision problems, epigastric pain, placental abruption, platelet count below 100,000/mm3 or aspartate aminotransferase (AST) levels above 70 IU/L, the patient was diagnosed with signs of multiple organ disorders. The presence of concomitant diseases, such as HIV infection, diabetes mellitus, chronic arterial hypertension and anemia, was assessed based on a patient survey or laboratory test results. Complications during childbirth and in the early neonatal period were assessed as the presence of at least one of the following complications: meconium aspiration, umbilical cord prolapse, vascular presentation, prolonged labor (more than 24 hours), uterine rupture, severe jaundice, neonatal sepsis, and a life-threatening congenital malformation. In women with hemoglobin levels less than 11 g/dl, anemia was reported as severe (Hgb <7.0 g/dl), moderate (Hgb 7.0–9.9 g/dl) and mild (Hgb 10.0-10.9 g/dl). The data was entered and analyzed using the Statistical Package for Social Sciences (SPSS) version 23 (RRID ID:

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SCR_002865). Percentages, indicators, frequency distribution, measures of central tendency such as mean and median, as well as measures of variance such as interquartile range and standard deviation were used to describe various variables. The relationship was considered significant if the p-value was less than 0. The values of 05 and the adjusted odds ratio were presented along with their 95% confidence interval. To more accurately calculate the impact of preeclampsia and its treatment regimens on perinatal mortality, the study attempted to assess the impact of other possible causes of perinatal mortality using the variable "complications during childbirth and in the early neonatal period" and using multifactorial logistic regression.

Results and Discussion

The results of the study were based on the course of pregnancy and childbirth of 187 women. The average age of the mother was 25.73 ± 4.8, with a minimum age of 15 years and a maximum age of 40 years. More than half of the surveyed 102 (54.5%) women were urban residents. The study also assessed complications during childbirth and in the early neonatal period, which can lead to the death of a newborn. There were 20 (10.7%) cases of stillbirth, half of which were related to meconium aspiration.

The average time elapsed from the onset of symptoms to the patient's admission to the hospital was 14 hours. In patients with severe preeclampsia and preeclampsia complicated by chronic hypertension, there was significant variability in the duration of the period from admission to the hospital to the onset of labor, with the minimum duration being 1 hour and the maximum being 192 hours (8 days).

The most commonly used anticonvulsant was magnesium sulfate, which was prescribed to 130 (69.5%) patients, followed by diazepam, which was prescribed to 50 (26.7%) patients. The most commonly used antihypertensive drugs were methyldopa and nifedipine. Anticonvulsant drugs were prescribed to 171 (91.4%) patients during childbirth, and their use continued for 24 hours after delivery or since the last seizures in 137 (73.3%) patients. Of the 187 patients, 115 (61.5%) had spontaneous labor, and 71 (38%) had artificial labor. Spontaneous delivery through the natural birth canal was the main method of delivery in 88 (47.1%) patients, while in 99 (52.9%) patients, delivery was performed surgically by caesarean section. When comparing the method of delivery with the severity of the disease (moderate or severe preeclampsia), the frequency of surgical delivery was statistically higher in women with severe preeclampsia compared with women from the control group ($p = 0.013$), while there were no significant differences in the frequency of spontaneous vaginal delivery ($p = 0.613$).

The average gestation period in weeks and days at the time of delivery was 37+6 (±2+5), and the minimum and maximum values are 24 and 42 full weeks, respectively. The average Apgar score at the 1st and 5th minutes was 5.98 (±2.36) and 6.91 (±2.67), respectively. The average birth weight was 2608.02 (± 558.8) grams. In severe preeclampsia, low birth weight was observed more often than in mild (53.7% vs. 32%) $p = 0.001$. During the 3 years of follow-up, 47 cases of perinatal death were recorded, which corresponds to the perinatal mortality rate of 197/1000 births. Of these, 27 (57.4%) ended in stillbirth, while the remaining 20 (42.6%) died during the first week of hospital stay. Perinatal mortality was higher (76.59% vs. 23.4%) among children born to mothers

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with severe preeclampsia than among children born to mothers with moderate preeclampsia (p = 0.01).

The negative impact of complications during childbirth and in the early neonatal period on perinatal outcomes was also revealed, the probability of perinatal death increased almost 5 times. However, this variable is an independent cause of perinatal death even in the absence of preeclampsia. As a result of the final analysis, it was found that the measurement of diastolic blood pressure and the Apgar score at the 5th minute are associated with perinatal mortality. Accordingly, the probability of perinatal mortality was almost 3 times higher (OR = 2,824; 95% CI (1,154–6,038)) in women whose diastolic blood pressure at admission was above 110 mmHg, compared with women who had it below 110 mmHg. In newborns who received from 0 to 3 points on the Apgar scale after 5 minutes, the risk of death It was 5 times higher (OR = 5.046; 95% CI (1,856–8,235)) than in newborns who received from 7 to 10 points on the Apgar scale after 5 minutes.

The time elapsed from the onset of symptoms to the patient seeking medical help is a cumulative indicator of the patient's behavior regarding seeking medical help, accessibility of medical care, infrastructure, and transportation. As for the treatment methods used, compliance with current national guidelines and management protocols helps to offset the negative impact on perinatal outcomes.

Conclusion

In previous studies, the perinatal mortality rate among mothers with preeclampsia ranged from 47/1000 to 416/1000 live births. The perinatal mortality rate recorded in our study (197/1000 live births) was in this range, but was slightly higher than in the two studies, where this figure was 120/1000 and 160/1000 deaths per 1000 live births. Differences in mortality rates may be due to differences in the gestational age thresholds used in different studies, the type of hypertensive disorders, as well as the capabilities of the clinic in which patients were observed.

In women with diastolic blood pressure above 110 mmHg, the probability of perinatal death was 2 times higher than in women with lower diastolic blood pressure. During the observation period, the trend towards the use of magnesium sulfate as an anticonvulsant increased. However, according to the national protocol, its use was not extended until 24 hours after delivery or from the moment of the last seizures. According to our analysis, diastolic blood pressure and Apgar score at the 5th minute were associated with perinatal mortality. The authors recommend that future large-scale research in the field of auditing medical services and evaluating their effectiveness in regions with limited resources can serve as a basis for policy makers to take measures to improve the quality of clinical care and reduce mortality rates.

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