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Perinatal outcomes of pregnant women with severe pre-eclampsia: Cross-sectional study

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ABSTRACT

Objectives: To investigate the perinatal outcomes of pregnant women diagnosed with severe pre-eclampsia. **Methods**: Cross-sectional study carried out in a maternity school, with a sample of 157 fetuses/neonates of pregnant women diagnosed with severe pre-eclampsia. For data analysis, the values of descriptive statistics were calculated using SPSS 21.0. **Results:** In 22.3% of cases, pregnancy evolved with a diagnosis of intrauterine growth restriction. There was an 7.6% incidence of fetal death. Among the neonates, 48% were born younger than 37 weeks and more than half (56.7%) were classified as underweight. The APGAR index in the first and fifth minutes were compatible with moderate anoxia. 20.4% of newborns required resuscitation and 18.5% were admitted to the neonatal intensive care unit. **Conclusions:** Pre-eclampsia had repercussions with the presence of intrauterine growth restriction, fetal death, prematurity, low weight, need for neonatal resuscitation and admission to the intensive care unit.

DESCRIPTORS: Pregnancy-induced hypertension; Perinatal care; Perinatal nursing.

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INTRODUCTION

The analysis of maternal and neonatal health indicators is used worldwide to assess the quality of health services in a given location or country. Therefore, conducting research that focuses on this topic is essential for diagnosing the health reality and reorienting care practices, in addition to alerting professionals to the importance of actions that minimize the problems raised by studies[1].

The perinatal period is conceptualized by the World Health Organization (WHO) as the one that begins at the 22nd week of gestation and extends until the 28th day of birth of the fetus[2], which is further divided into an early neonatal (0- 7 days) and late neonatal (8-28 days).

In epidemiological terms, in 2014, data on early neonatal mortality in the country were alarming. In that year, the mortality rate from total causes was 6.8 deaths per thousand born, and of these, 2.7 of the deaths were due to preventable causes, which could be reduced with adequate care for women during prenatal care[3]. Among the causes considered to be preventable, Gestational Hypertensive Syndromes (GHS), which includes severe Preeclampsia (sPEG), are responsible for a considerable amount of perinatal mortality and morbidity[3].

Regarding PEG, this is conceptualized as hypertension that occurs after the 20th week of pregnancy, accompanied by signs of severity such as elevated blood pressure equal/ greater than 160/110 mmHg, proteinuria equal/greater than 2.0 g or 2 + on urinary analysis, oliguria, serum creatinine levels greater than 1.2 mg/dL, signs of hypertensive encephalopathy, epigastric pain, pulmonary edema, liver dysfunction, coagulopathy and thrombocytopenia, in addition to intrauterine growth restriction and/or oligohydramnios[4]. Such severity indicators have an impact not only on the woman's health but also on the baby's life and birth conditions. Therefore, knowledge about the consequences of the pathology for the unborn child becomes relevant, in order to draw the attention of professionals, doctors and nurses regarding the importance of early identification during prenatal care, as well as its proper management in the post-diagnosis[5].

In addition, in a review carried out on the databases, it was found that there is scientific evidence that analyzes perinatal outcomes in the presence of obstetric complications such as Gestational Diabetes Mellitus (GDM) and GHSs[5]. Concerning the latter, works on perinatal results in the occurrence of pre-eclampsia with no signs of severity were highlighted.

Therefore, research has highlighted the need and relevance of carrying out investigations that address perinatal results in view of the specificities and diagnostic complexity of PEG[5]. In view of the problem raised, this study presents the following research question: What are the perinatal outcomes of pregnant women diagnosed with sPEG?

In order to answer the aforementioned question, the research aimed to investigate the perinatal outcomes of pregnant women diagnosed with severe pre-eclampsia.

METHOD

A cross-sectional descriptive study performed in a university maternity hospital located in the city of Natal, Rio Grande do Norte (RN),

Brazil, which is a reference for medium and high complexity gynecological and obstetric care in the state.

The research sample corresponded to the fetuses/neonates of pregnant women diagnosed with sPEG, totaling 157 subjects, through prospective and retrospective collection with data collection during the period from September 2016 to September 2017. A timeline was chosen as PEG has a low incidence; a fact that makes it difficult to collect a sample number based on the value of its prevalence.

Previously, a pilot test of the collection instrument was carried out with 10 women, who were not part of the final analysis of the work. Fetuses/neonates of pregnant women diagnosed with PEG who were admitted to the Maternity Intensive Care Unit (MICU) for the treatment of hypertensive syndrome and who had a single pregnancy, with delivery between 23 and 42 weeks of gestation, regardless of the route (vaginal, forceps or cesarean section) and fetal vitality (intrauterine fetal death, live birth or neonatal death). Fetuses/neonates of pregnant women admitted to the MICU diagnosed with other hypertensive syndromes and pregnant women with twin births diagnosed with sPEG were excluded.

The perinatal outcomes investigated were fetal vitality, Gestational Age (GA) of the newborn, sex of the fetus/neonate, APAGAR in the 1st and 5th minutes of life, need for neonatal resuscitation, birth weight, admission to the Neonatal Intensive Care Unit (NICU) and early neonatal morbidities. Data on socioeconomic and obstetric characteristics of pregnant women diagnosed with PEG were also collected.

For data analysis, the values of frequency, percentage, average, median or standard deviation were used with the use of SPSS 21.0. The values were presented descriptively or in tables.

The project was submitted to the Research Ethics Committee (REC) of the Universidade Federal do Rio Grande do Norte (UFRN) and follows the recommendations of Resolution 466/2012 of the National Health Council (NHC). Ethical issues were observed at all times of the study, maintaining the confidentiality and anonymity of the participants' medical records. The pre-project was approved under the number: 2,013,851 and C. A. A. E: 64881817.5.0000.5537.

RESULTS

The perinatal outcomes verified by the study are shown in Table 01. Regarding vitality at birth, most neonates were born alive (91.1%), with 7.6% of IUFD and 1.3% early neonatal death. The median GA was 37.0 weeks, with 48.4% born preterm. The median birth weight was 2.665g and, in addition, more than half of the newborns (56.7%) were classified as having low birth weight (<2.500 g).

The APGAR index in the first and fifth minutes averaged 7.1 (SD: 2.64) and 8 (SD: 2.55), respectively. Despite this, 21% of neonates had APGAR in the first minute compatible with moderate anoxia (score less than 7), which persisted in 11.5% of newborns in the fifth minute. In addition to this data, it was found that 20.4% of newborns required resuscitation in the delivery room, with the observation that they were born by cesarean section. There was a predominance of males (56.7%).

The most common neonatal morbidity was respiratory distress (14.6%), followed by hypoglycemia (1.3%), heart disease, congenital syphilis and isoimmunization (1.8%). NICU admission occurred in 18.5% of cases. The ultrasound findings corresponded to the occurrence of IUGR in 22.3% of the fetuses and 15.9% of the pregnancies evolved with oligohydramnios.

The characterization of the mothers corresponds to a profile of women with an average age of 27 years (SD=7), an average of 9 years (SD=2) and the majority (91.7%) with a family income of up to 1 minimum wage; 64.3% reported being in a relationship and 80.3% declared themselves to be brown in color. As for the obstetric history, 41.4% were primigravidas and (46.5%) primiparous. In multiparous women, 26.1% experienced vaginal delivery, 25.5% had a cesarean section and 15.9% had a history of abortion. The fetal vitality of the last delivery was mainly represented by the birth of live neonates (50.3%), low occurrence of fetal death (1.9%) and early neonatal death (1.3%).

The family history of Arterial Hypertension (AH) was present in 68.2% of the subjects, while 21.7% of the women had a previous diagnosis of the pathology. Concerning the history of sPE, 14% of women report the occurrence of it in family members and 12% had the pathology in previous pregnancies.

It is noteworthy that 64.2% of pregnant women had six or more visits registered in their medical notes. The weight of the pregnant women at the last visit was 77 kg (Mdn) and most of them denied the use of tobacco (95.5%), alcohol and or drugs (96.8%). Cesarean delivery was the preferred mode of delivery in 89.2% of deliveries.

With regard to clinical variables, systolic and diastolic pressure had a median of 168/110 mmHg; 41.4% had two or more + proteinuria urine analysis and no changes in serum creatinine values (Mdn = 0.7), TGO (Mdn = 19), TGO (Mdn = 13) or platelets (Mdn = 208). In addition, 39.5% of pregnant women had headache and visual disturbances, 36.3% had epigastric or right hypochondrial pain and there was no occurrence of oliguria.

Regarding the therapies used, methyldopa was the most frequent choice for the treatment of hypertension during pregnancy (82.8%), 15.9% of pregnant women did not receive medication and the drugs most used during sPEG were hydralazine and magnesium sulfate (76.4%). Other drugs were also used, such as nifedipine, methyldopa, furosemide and captropil.

DISCUSSION

In the present study, the certification of the severity components of the pregnant woman during the data collection process of this research allowed the identification of unfavorable perinatal results such as IUGR, IUFD, prematurity, low birth weight, need for resuscitation and admission to the NICU. The 7.6% incidence of IUFD in the population of pregnant women with sPEG, identified in this investigation, was higher than that of another study conducted in Rio Grande do Sul, in which the proportion of fetal deaths in high-risk pregnant women was lower (2.9%)[6].

In general, research indicates that fetal death occurs mainly in the last gestational trimester and its occurrence reflects the quality of

Table 01. Percentage distribution of perinatal outcomes of pregnant women with severe preeclampsia. Natal/RN, 2017

Perinatal outcome	Total (157)	
	N	%
Fetal vitality		
Live birth	143	91.1
Fetal death	12	7.6
Early neonatal death	2	1.3
Gestational age		
< 37	76	48.4
≥ 37	81	51.6
Weight		
< 2.500 kg	67	43.3
≥ 2.500 kg	90	56.7
APGAR 1st minute		
<7	33	21.0
≥7	124	79.0
APGAR 5th minute		
<7	18	11.5
≥7	139	88.5
Neonatal resuscitation		
Yes	32	20.4
No	113	72.0
Not applicable	12	7.6
Fetal sex		
Undefined	2	1.3
Female	66	42.0
Male	89	56.7
Early neonatal morbidities		
Absent	129	82.2
Hypoglycemia	2	1.3
Respiratory discomfort	23	14.7
Heart disease	1	0.6
Congenital syphilis	1	0.6
Isoimmunization	1	0.6
Admission to the neonatal intensive care unit		
Yes	29	18.5
No	116	73.9
Not applicable	12	7.6

Source: Data collected by the author

prenatal care, since it is considered to be potentially preventable or preventable by health actions and services. In Brazil, the Fetal Mortality Rate (FMR) reaches values of 10.97/1,000 births, highlighting the North and Northeast Regions as responsible for this index[7].

The results of the study highlight a high percentage of preterm births. In the world, 11.1% of births are premature and in Brazil

this value reaches 11.8%, which places the country in the tenth position among the countries with the highest numbers of premature births[8]. In particular, unborn children of pregnant women with sPE are associated with prematurity when compared with normotensive pregnant women[9].

Low birth weight was observed in 43.3% of the neonates surveyed. Epidemiological data of puerperal women who had or did not have sPE during pregnancy identified a significant difference ($p < 0.05$) between the mean birth weights of neonates born to normotensive mothers (3.150 kg) in relation to the weight of those born to pregnant women with the hypertensive disorder (2,500 kg)[10].

It should be noted that prematurity and low weight are strongly related to neonatal mortality, increasing the chance of death in neonates with such characteristics by 44 to 50 times[10]. It is a condition that refers to the need to qualify prenatal care in order to prevent and reduce the factors related to mortality in this period[11].

The APGAR in the first minute of the neonates involved in this study was comparable with moderate anoxia in 21% of the cases. After, the newborns showed a good evolution in the fifth minute, so that 11.5% remained with a score below 7. Thus, a good evolution of the score from the first to the fifth minute suggests the effectiveness of immediate assistance[12]. There is evidence that the presence of hypertensive disorder alone does not increase the frequency of low APGAR values[9], but that it is influenced by conditions such as prematurity, malformations and other congenital morbidities[13].

There was a 20.4% frequent of neonatal resuscitation in the delivery room among neonates of mothers with sPEG, with a more prevalent occurrence among preterm and low birth weight newborns. It is noteworthy that other studies carried out with high-risk neonates born to mothers with hypertensive disorders had a lower frequency of resuscitation (15.8% and 18.1%)[14], which emphasizes the data found in the study, as this highlights the impact of PEG on the outcome of neonatal resuscitation. When, in fact, it is estimated that approximately 10% of NBs effectively need intervention to start breathing[15].

It is worth mentioning that, according to the Brazilian Society of Pediatrics (BSP), maternal hypertensive syndrome is among the risk factors associated with the need for intervention[15].

In this investigation, it was also observed that resuscitation maneuvers in the delivery room occurred exclusively in newborns born by cesarean delivery. In this regard, birth by this route is considered a risk factor that increases the need for resuscitation, even in full-term neonates[15]. A research involving neonates with adequate weight showed that resuscitation was necessary in 39% of cesarean deliveries, while only 12.7% of newborns born by vaginal delivery required the intervention, which confirms the cesarean delivery as a risk factor for neonatal resuscitation[16].

It is considered that the population studied in this dissertation corresponded to pregnant women who presented severe characteristics capable of influencing the conditions of the NB at birth, and that cesarean section, in these cases, is indicated due to maternal and fetal impairment.

Regarding the gender of the newborns, the male gender was predominant among those born to women with PEG, a finding also verified in relation to IUFD. Similar results were found in another study[17] and are consistent with the Brazilian epidemiology, which estimates that the male sex ratio is higher in fetal deaths when compared to live births, in order to suggest the vulnerability of the male sex to the maternal conditions, including PEG[18].

A significant proportion of NBs from mothers with sPEG was admitted to the NICU (18.5%). Thus, admission to the NICU was considered as another negative outcome associated with PEG. In different realities, more newborns born to mothers with PEG were more admitted to intensive care units than those born to normotensive pregnant women, with a hospitalization rate ranging from 9.1% to 40%[14]. Reinforcing the data mentioned above, the descriptive results of another investigation elucidated that, among the neonates admitted to an intensive care unit, 62% of pregnant women had conditions during pregnancy, with GHSs were responsible for 32.2% of the total[12].

The incidence of 22.3% of intrauterine growth restriction was also found. These data are corroborated by investigations that point to sPE, be it mild and, mainly, severe, as the precursor of placental changes resulting from maternal vasoconstriction, which result in the restriction of fetal growth. An even greater occurrence of the restriction (23.1%) was identified in pregnant women with PEG, which confirms the magnitude of the problem in this specific group of the population[19].

The prevalence of IUGR worldwide varies between 3 and 15% depending on the region, population epidemiological profile and socioeconomic conditions. The problem affects 10 to 15% of pregnancies in Brazil[20].

Finally, it is considered that the studies carried out in Brazil and in other countries bring evidence that pregnant women with severe hypertensive disorders have a higher incidence of negative perinatal outcomes, as confirmed by this research.

CONCLUSIONS

Perinatal outcomes of pregnant women with PEG correspond to a high incidence of IUFD (7.6%), a significant proportion of neonates classified as preterm (48.4%) and low birth weight (56.7%). The male gender was more frequent (56.7%).

APGAR in the first and fifth minutes were, 21% and 11.5%, respectively, compatible with moderate anoxia. The most common neonatal morbidity was respiratory distress. There was a significant percentage (20.4%) of newborns who needed resuscitation maneuvers in the delivery room and admission to the NICU.

The study is limited due to the restricted period of prospective data collection and retrospective data collection. In the latter, data collection may have been influenced by the loss of data not contained in the medical record, such as the family and personal history of AH or sPE. It is suggested to perform other studies that seek to compare the perinatal results of different groups of pregnant women with SHG, in order to measure the risk measures relative to which the fetuses/neonates of each group are exposed and to infer their impact on the perinatal outcomes and neonatal.

Thus, it is concluded that with this research it was possible to isolate the negative repercussions of PEG on perinatal outcomes, mainly represented by the presence of IUGR, IUFD, prematurity and low birth weight, which, in turn, also influence other results negative factors such as the need for neonatal resuscitation and admission to the NICU.

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