Maternal chronic arterial hypertension in pregnancy

Hipertensão arterial crônica materna na gestação

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Keywords: Arterial hypertension, Pregnancy, Chronic diseases.

1 INTRODUCTION

Hypertension is one of the numerous chronic diseases that has a significant representation in the population, resulting in high morbidity rates associated with cardiovascular, coronary, encephalic, renal and vascular complications. When present during pregnancy, serious maternal-fetal complications are evident, such as: worsening of the hypertensive condition, superimposed preeclampsia, fetal growth restriction, premature delivery, premature placental displacement and fetal death. Given this, chronic arterial hypertension (CAH) is a disease of variable severity on the repercussions on perinatal outcome, with complication rates ranging from 1 to 5% of all pregnancies. Thus, it is noted that hypertensive diseases are being the leading causes of maternal mortality, according to data published in 2012, by the Ministry of health. (FREIRE; TEDOLDI; 2009).

However, women with chronic hypertension have a four times higher risk of developing complications than the general population and should be seen before pregnancy or at the first antenatal visit for risk assessment. After this assessment, they can be classified into high and low risk, taking into account systolic and diastolic blood pressure and organ damage. Studies have shown that women with mild hypertension and no target organ damage have an uncomplicated gestational outcome, while others classified as severe contribute to increased perinatal morbidity and mortality. Some hypertensive women have uncomplicated pregnancy, evolving similarly to pregnant women in general and others develop complications that compromise pregnancy (FREIRE; TEDOLDI; 2009).

Chronic hypertension in pregnancy is defined as hypertensive state preexisting pregnancy or diagnosed before the 20th week. It is considered hypertension when systolic

blood pressure is greater than 140 mmHg and/or diastolic blood pressure is greater than 90 mmHg, measured on two or more occasions. It is also considered chronic hypertension of pregnancy that first diagnosed during pregnancy and that does not normalize after 6 to 12 weeks of delivery. (CARNIDE; *et al;* 2008).

Hypertensive syndromes that occur during pregnancy (HSG) are classified into chronic hypertension (CH), preeclampsia/eclampsia (PE), preeclampsia superimposed on chronic hypertension (PSHC) and gestational hypertension (HG). These syndromes contribute to prematurity and perinatal mortality due to intrauterine hypoxia (CARNIDE; *et al;* 2008).

Attention to chronic arterial hypertension (CAH) in women is important due to its complexity. In addition to target organ damage, which usually affects the adult individual, such as heart disease, left ventricular hypertrophy, previous myocardial infarction, previous coronary artery bypass grafting and heart failure; stroke, nephropathy, peripheral arterial disease and retinopathy. In pregnancy, there is also a high risk of maternal and neonatal complications. Furthermore, pregnant women with pre-eclampsia are born to women with pre-existing CAH in 15-25% of cases. The worsening of the perinatal prognosis is directly related to the severity of the superimposed pre-eclampsia and some complications are mentioned, such as the high rate of perinatal mortality, preterm births and small-for-gestational-age fetus. Complications such as superimposed preeclampsia, prematurity and perinatal mortality are more frequent in black hypertensive women than in white ones (CARNIDE; *et al;* 2008).

Hypertension is considered low risk when it has an essential etiology not complicated with organ damage, systolic pressure below 160-170 mmHg and diastolic below 110 mmHg and no history of previous perinatal death. This pregnant woman does not need antihypertensive medication, only blood pressure control, change of lifestyle and eating habits, in addition to control of fetal growth and vitality, in addition to a rigorous prenatal monitoring. (CARNIDE; *et al;* 2008).

High risk is defined when systolic pressure is equal to or greater than 160-170 mmHg and diastolic pressure equal to or greater than 110 mmHg, secondary cause and complicated by organ damage. This pregnant woman requires hospitalization, antihypertensive treatment, assessment of fetal growth and vitality, and often indication for operative delivery before 37 weeks of gestation. High-risk chronic hypertensive women may experience postpartum complications such as pulmonary edema, hypertensive encephalopathy and renal failure. These risks may be particularly increased,

with organ impairment, superimposed preeclampsia or placental abruption. (CARNIDE; *et al*; 2008).

Given this, hypertensive syndromes are considered the most frequent complications in pregnancy and are, in Brazil, the first cause of maternal death, especially when they are installed in their severe forms, such as eclampsia and HELLP Syndrome. Therefore, they are responsible for high rates of perinatal mortality, prematurity, in which they directly influence fetal growth and development. Eventually the preeclampsia can be installed in a chronic hypertensive pregnant woman, a condition called preeclampsia superajuntada. (GRACIA; 2001).

According to the literature, pre-eclampsia has an unknown etiology, its pathophysiology is related to the decrease in placental perfusion consequent to the failure of trophoblast invasion in the spiral arteries. As a result, there will be altered endothelial function, activation of the inflammatory process, a drop in prostaglandin levels and increased thromboxane action resulting in increased vascular reactivity. Uteroplacental flow is decreased leading to placental insufficiency. Among the severity criteria, HELLP syndrome is considered a clinical entity that occurs in pre-eclampsia and eclampsia, characterized by a set of signs and symptoms associated with microangiopathic hemolysis, thrombocytopenia and changes in liver function tests. The term HELLP was first used by Louis Weinstein in 1982 and was based on the initials of the words: Hemolisys, Elevated Liver function tests and Low Platelet counts, i.e. hemolysis, elevated liver enzymes and plateletopenia (GRACIA; 2001).

Preeclampsia is characterized by the appearance of hypertension, with proteinuria and/or edema, occurring after the twentieth gestational week and is predominantly a pathology of the primigravida. In addition, it is noted that there are predisposing factors in relation to pregnant women who already have hypertension, diabetics, autoimmune diseases, diseases of the renal parenchyma and those with increased placental mass as multiple gestation, molar gestation, in which contribute to the emergence of this gestational complication. (GRACIA; 2001).

Thus, it is not possible to prevent pre-eclampsia due to lack of knowledge of its etiology, and low-dose aspirin can be used for this purpose in high-risk cases. Once the disease is diagnosed, the goal of treatment is the prevention of maternal-fetal complications such as placental abruption, stroke, acute pulmonary edema, renal failure and worsening of the clinical picture for severe preeclampsia, HELLP syndrome and eclampsia, already for the fetus can lead to premature birth and respiratory distress. The

best treatment for preeclampsia remains the prenatal care effectively, the diagnosis and early clinical treatment and the appropriate time for termination of pregnancy that is considered as a definitive treatment, in order to benefit and enhance maternal-fetal health. (GRACIA; 2001).

2 OBJECTIVE

To study the behavior of Systemic Blood Pressure in previously hypertensive pregnant women;

To study the development of hypertension in pregnant women;

Understand the clinical conditions that promote the development of Systemic Arterial Hypertension and its worsening in pregnant women;

Understand the risks of developing Systemic Arterial Hypertension for the health of the newborn.

3 METHODOLOGY

This study aimed to evaluate the development or existence of hypertensive syndromes, which is considered the leading cause of maternal death and responsible for high perinatal mortality rates.

As a result, 2 groups of pregnant women were studied, with a mean age of 34.7 years, the first referring to women who already had hypertension and became pregnant, and the other group consisting of women who during their pregnancy developed a clinical picture of hypertension.

Thus, the objective of this study is to verify the clinical conditions of both groups, pointing out their clinical conditions and their risks presented, in order to point out their influence on maternal-fetal health, in order to enhance the health of women and children in contemporary society.

4 RESULTS

Code	Age	Weight	Height	BMI	Previous Pathology	Evolution
01	38	62	1,70	21,4	Hypertensive	Normal delivery
02	36	61	1,68	21,6	Gestational SAH	Cesaria
03	25	60	1,67	21,58	Hypertensive	Normal delivery
04	24	65	1,73	22,4	Gestational SAH	Cesaria
05	38	75	1,67	26,9	Gestational SAH	Cesaria
06	38	62	1,63	23,3	Gestational SAH	Cesaria
07	33	59	1,68	20,92	Gestational SAH	Cesaria
08	39	55	1,70	19,03	Gestational SAH	Cesaria
09	41	65	1,67	23,38	Gestational SAH	Cesaria
10	35	63	1,65	23,16	Gestational SAH	Cesaria
Average	34,7	62,7	1,68	22,36	----------	----------

Treatment	Gestational Time	Final considerations
Medication with changes in lifestyle habits	41	Maintenance of HAS
Medication without changes in lifestyle habits	40	Maintenance of HAS
Medication with changes in lifestyle habits	37	Pre-eclampsia
Medication without changes in lifestyle habits	36	Eclampsia
Medication without changes in lifestyle habits	35	Eclampsia
Medication without changes in lifestyle habits	34	Pre-eclampsia
Medication without changes in lifestyle habits	34	Pre-eclampsia
Medication without changes in lifestyle habits	37	Eclampsia
Medication without changes in lifestyle habits	38	Pre-eclampsia
Medication without changes in lifestyle habits	36	Eclampsia
Average	37	----------

5 DEVELOPMENT AND DISCUSSION

Considering the proposal of this study to understand the development and behavior of hypertension in pregnant women and newborns, it is observed that hypertension associated with pregnancy is a strong risk factor for possible maternal and perinatal complications that can compromise gestational outcome.

Through the data collected in this study and the analysis made through it, it is noted that the drug therapy of hypertension promotes maternal and fetal protection, reducing progression to severe forms, helps to avoid prematurity and its neonatal repercussions. In turn, the association of drug treatment together with changes in lifestyle habits is of paramount importance, since, as exposed, pregnant women who made the association of drug treatment together with changes in lifestyle habits, did not present major complications in the gestational period associated with hypertension. This association, when well performed, goes beyond treating signs and symptoms, and can detect other risk factors early, controlling blood pressure, preventing more severe forms and possible seizures, controlling fetal growth and vitality and the resolution of pregnancy. It is noteworthy that the appropriate treatment of hypertension in pregnancy

aims to reduce the incidence of maternal complications, such as strokes, and morbidity and mortality from eclampsia, in addition to reducing prematurity rates.

Among the changes in lifestyle habits, rest in the left lateral decubitus position is recommended in order to promote increased renal plasma flow, intensifying natriuresis and, consequently, lowering blood pressure levels. In addition, it is recommended to reduce household chores and reduce the supply of salt, which when done correctly (low-sodium diet containing 2 to 3 g of salt/day) reduces serum sodium levels, reducing vascular reactivity, thus providing a drop in blood pressure. (ZUGAIB; 2019).

Pregnancy can aggravate hypertension existing before pregnancy, such as chronic hypertension; as well as induce it in normotensive women, thus generating gestational hypertension/pre-eclampsia/eclampsia. During normal pregnancy, there is an increase in heart rate, ejection volume, cardiac output and left ventricular mass. Pregnant women with chronic hypertension, when compared with normotensive pregnant women, have an unfavorable gestational performance. Although the etiology of hypertension originating in the gestational period remains unknown, some theories related to its etiology are: (1) deficiency of trophoblastic invasion); (2) immunological factors; (3) endothelial dysfunction and inflammatory changes; (4) genetic predisposition; (5) nutritional factors; (6) stress. (ZUGAIB; 2019).

Pre-eclampsia affects all maternal organs and systems, with greater intensity in the vascular, hepatic, renal and cerebral systems. The main risk factors for its development are: chronic hypertension, primigravida, diabetes, collagenosis, black race, obesity and thrombophilia. It is noteworthy that the natural evolution of the disease, without treatment, can evolve to severe forms, such as eclampsia and HELLP syndrome. Eclampsia is defined by the manifestation of one or more generalized tonic-clonic seizures and/or coma in a pregnant woman with gestational hypertension or pre-eclampsia, without the presence of neurological diseases. The exact cause of seizures is not known. Among the theories proposed are cerebral vasospasm with local ischemia, hypertensive encephalopathy with hyperperfusion, vasogenic edema and endothelial injury (PERAÇOLI; PARPINELLI; 2005).

HELLP syndrome is the extreme finding of the spectrum of changes that occur in pregnancy-induced hypertension/pre-eclampsia and as its signs and symptoms are confused with those of severe pre-eclampsia (epigastric or right upper quadrant pain, nausea and malaise), the mild forms may go unnoticed if the correct laboratory evaluation is not performed (hemolysis, elevated liver enzyme levels and low platelet count). This

syndrome is accompanied by increased maternal and perinatal morbidity and mortality. Microangiopathic hemolytic anemia is the hallmark of the syndrome, being attributed to the deformity and destruction of red blood cells in the microcirculation secondary to endothelial damage, vasospasm and fibrin deposition in the vascular walls (PERAÇOLI; PARPINELLI; 2005).

Finally, the most frequent repercussions for the fetus associated with hypertensive disease in pregnancy are intrauterine growth restriction, low birth weight and prematurity. It is also described in the literature that when the fetus is subject to a severe degree of placental insufficiency, such as that caused by maternal hypertension, it suffers from hypoxia. In addition, newborns of hypertensive mothers have a higher risk of developing respiratory distress syndrome, requiring a greater need for surfactant (PERAÇOLI; PARPINELLI; 2005).

Thus, knowledge of the pathophysiology of chronic arterial hypertension, preeclampsia, early diagnosis and precise action at the appropriate time in situations complicated by eclampsia and/or HELLP syndrome allow improving maternal and perinatal prognosis and, mainly, reducing the high rates of maternal/fetal morbidity and mortality (PERAÇOLI; PARPINELLI; 2005).

6 CONCLUSION

The presence of hypertension, whether prior or specific to pregnancy, is one of the most common complications in the gestational period and can lead to serious maternal-fetal complications.

Chronic hypertension in pregnancy is defined as hypertensive state preexisting pregnancy or diagnosed before the 20th week; or the presence of hypertension diagnosed for the first time during pregnancy and not normalizing after 6 to 12 weeks of delivery. Hypertension is considered when systolic blood pressure is greater than 140 mmHg and/or diastolic blood pressure is greater than 90 mmHg. During prenatal care, it should be diagnosed as early as possible, with the aim of preventing or detecting progression to more severe forms of the disease.

Uteroplacental flow is decreased, which is the main contributor to adverse perinatal outcomes.

Pre-eclampsia and eclampsia have common pathophysiological processes, while eclampsia is a manifestation of the central nervous system impairment of pre-eclampsia. HELLP syndrome can occur in pre-eclampsia or eclampsia and is characterized by a set

of signs and symptoms associated with microangiopathic hemolysis, elevated liver enzymes and thrombocytopenia.

Through this study and the data collected through it, it is concluded that the earlier the diagnosis of hypertension added to timely intervention, responsible and correct use of drugs and changes in lifestyle habits, the greater the chances of conducting a pregnancy without maternal complications and harm to the health of the conceptus.

It is believed that the results presented may contribute to a greater knowledge and doctor-patient approach towards pregnant women, in order to contribute to the reduction of maternal-fetal complications rates caused by the presence of hypertension during pregnancy.

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