Hypertension in Pregnancy

Abstract

Background: Hypertension affects 10% of pregnancies in the US and is the leading cause of maternal and infant mortality. Hypertension during pregnancy involves several conditions, particularly preeclampsia, a type of hypertension that differs from pregnancy, which is more de Novo or chronic hypertension. Risks to the fetus include premature birth, stunted growth, and death. Childbirth is a direct treatment for preeclampsia. Treatment of acute hypertension is necessary to prevent cerebrovascular, cardiac, and renal problems in the mother. The other two types of hypertension, chronic and transient hypertension, are usually very bad. Proper management of hypertension during pregnancy requires consideration of various factors in the cardiovascular physiology of pregnancy. The main goal is to prevent complications in the mother associated with impaired uterine blood flow and fetal blood circulation. Before prescribing an antihypertensive drug, it is important to carefully evaluate the potential risk to the fetus from the interaction of uterine drugs.

Conclusion: The ultimate goal of treating high blood pressure during pregnancy is to have a healthy newborn without harming the mother's health.

Keywords*: Gestational hypertension; chronic hypertension; eclampsia; preeclampsia.*

Introduction

Hypertension is a very common medical problem experienced during pregnancy, making it difficult for 2-3% of pregnancies. High blood pressure during pregnancy is divided into 4 stages, as recommended by the National Working Group on High Blood Pressure in Pregnancy: 1) high blood pressure, 2) preeclampsia-eclampsia, 3) high blood pressure preeclampsia, 4) gestational hypertension (transient pregnancy hypertension or chronic hypertension identified in the last trimester of pregnancy). This term is preferred over the old but widely used term pregnancy-induced hypertension (PIH) because it is more accurate (1).

Causes and Risk Factors

There are several factors involved in the exact cause of preeclampsia. Experts believe that the placenta begins to nourish the fetus during pregnancy. Early in pregnancy, new blood vessels develop and change to send blood to the placenta. In women with preeclampsia, these arteries do not develop or are poorly visible. They are smaller than normal blood vessels and react differently to hormone expression, which limits the amount of blood flowing through them. Causes of these abnormal developments include: insufficient blood flow to the uterus, injury to the blood vessels, immune system problems, certain genes, and other hypertensive disorders during pregnancy, preeclampsia is one of four diseases of hypertension. . It can occur during pregnancy (2).

The other three are Gestational hypertension. Women with high blood pressure during pregnancy have high blood pressure but have little protein in their urine or other symptoms of organ damage. Some women with gestational hypertension develop preeclampsia, Chronic hypertension before pregnancy or before 20 weeks of pregnancy. But because high blood pressure is often asymptomatic, it can be difficult to tell when it started. Chronic hypertension with superimposed preeclampsia: This condition occurs in women who have been diagnosed with chronic high blood pressure before pregnancy, but then develop high blood pressure and protein in the urine or other health problems during pregnancy (3).

Preeclampsia doesn't start until there is a problem with the pregnancy. Risk factors are a History of preeclampsia. Personal or family preeclampsia significantly increases the risk of preeclampsia. The risk of preeclampsia is high during your first pregnancy, new father. Any pregnancy with a new partner increases the risk of preeclampsia in addition to a second or third pregnancy at the same age. The risk of preeclampsia is higher in very young pregnant women and in women older than 35 years. Race. Black women have a higher risk of developing preeclampsia than women of other races. Obesity. The risk of preeclampsia is higher if you are overweight and have multiple pregnancies. Preeclampsia is more common in women who have twins, triplets, or other relapses. Pregnancy gap: Children younger than two years or more than 10 years apart are at increased risk of preeclampsia. History of certain conditions: Certain medical conditions before pregnancy, such as chronic high blood pressure, migraines, type 1 or 2 diabetes, kidney disease, a tendency to form blood clots, or lupus, increase the risk of preeclampsia. In Vitro Pregnancy: Your chances of developing preeclampsia increase if your baby becomes pregnant as a result of in vitro fertilization (4).

Pathophysiology

High blood pressure during pregnancy has several risks, including decreased blood flow to the placenta. If the placenta does not get enough blood, your baby may get less oxygen and nutrients. This can lead to stunted growth (stunted growth within the uterus), low birth weight, or premature birth. Premature ejaculation can lead to respiratory problems, risk of infection in the baby, and other complications and placental inflammation. Preeclampsia increases your risk of developing the disease if the placenta separates from the lining of the uterus before you are born. The severe rash can cause severe bleeding, which can be dangerous to you and your baby. Limitation of uterine growth. Hypertension slows or slows the growth of the baby (prevents the development of the uterus). Injury to some of your organs. Uncontrolled hypertension can damage your brain, heart, lungs, kidneys, liver, and other vital organs. In extreme cases, it can be life-threatening. Initial delivery. Sometimes premature birth is necessary to avoid complications that can be dangerous if you have high blood pressure during pregnancy. Heart disease is coming soon. Preeclampsia may increase your risk of heart disease (heart and blood vessels) in the future. The risk of heart disease is high if you have preeclampsia more than once or if you have preterm birth due to high blood pressure during pregnancy (Figure 1) (5).

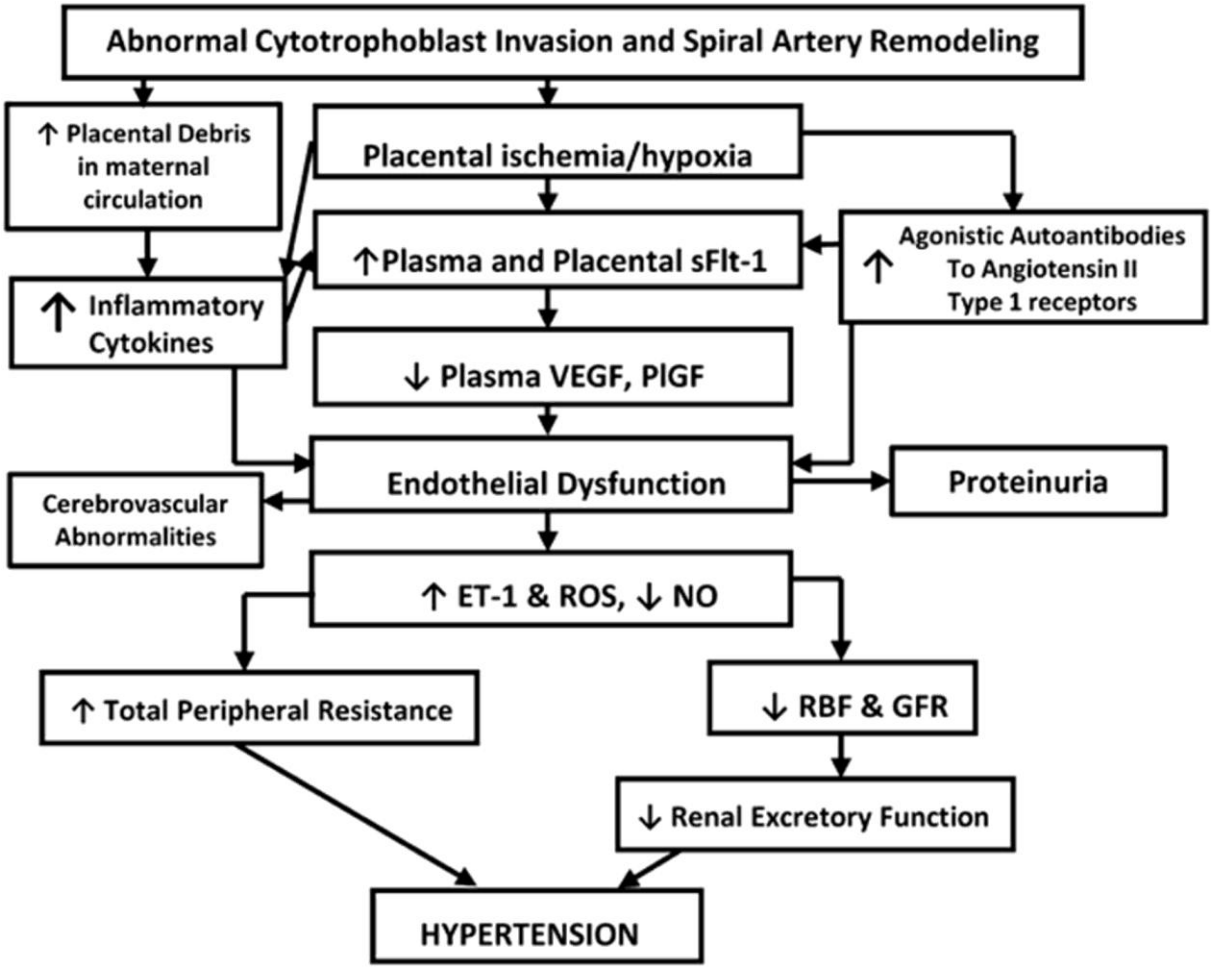

Figure 1 Pathophysiology of Hypertension during Pregnancy (6)

Classification

Sometimes there is high blood pressure before pregnancy. In some cases, blood pressure rises during pregnancy. Pregnancy Hypertension: In women with high blood pressure during pregnancy, high blood pressure begins after 20 weeks of gestation. There is little protein in the gut or other signs of organ damage. Some women with gestational hypertension develop preeclampsia. Arterial hypertension: Chronic hypertension, high blood pressure that existed before pregnancy or that occurred 20 weeks before pregnancy. But because high blood pressure is often asymptomatic, it can be difficult to determine when it started. Chronic hypertension with superimposed preeclampsia: This condition is seen in women with chronic high blood pressure before pregnancy who begin to experience high blood pressure and proteinuria or other problems associated with high blood pressure during pregnancy. Preeclampsia: Preeclampsia occurs when high blood pressure begins after 20 weeks of pregnancy and is associated with symptoms of damage to other organs, including the kidneys, liver, blood, or brain. Untreated preeclampsia can cause serious or fatal complications for the mother and baby, including progressive syncope (eclampsia). Previously, preeclampsia was diagnosed only when a pregnant woman had high blood pressure and protein in the urine. Experts now know that you may have preeclampsia without protein in your urine (Figure 2) (7).

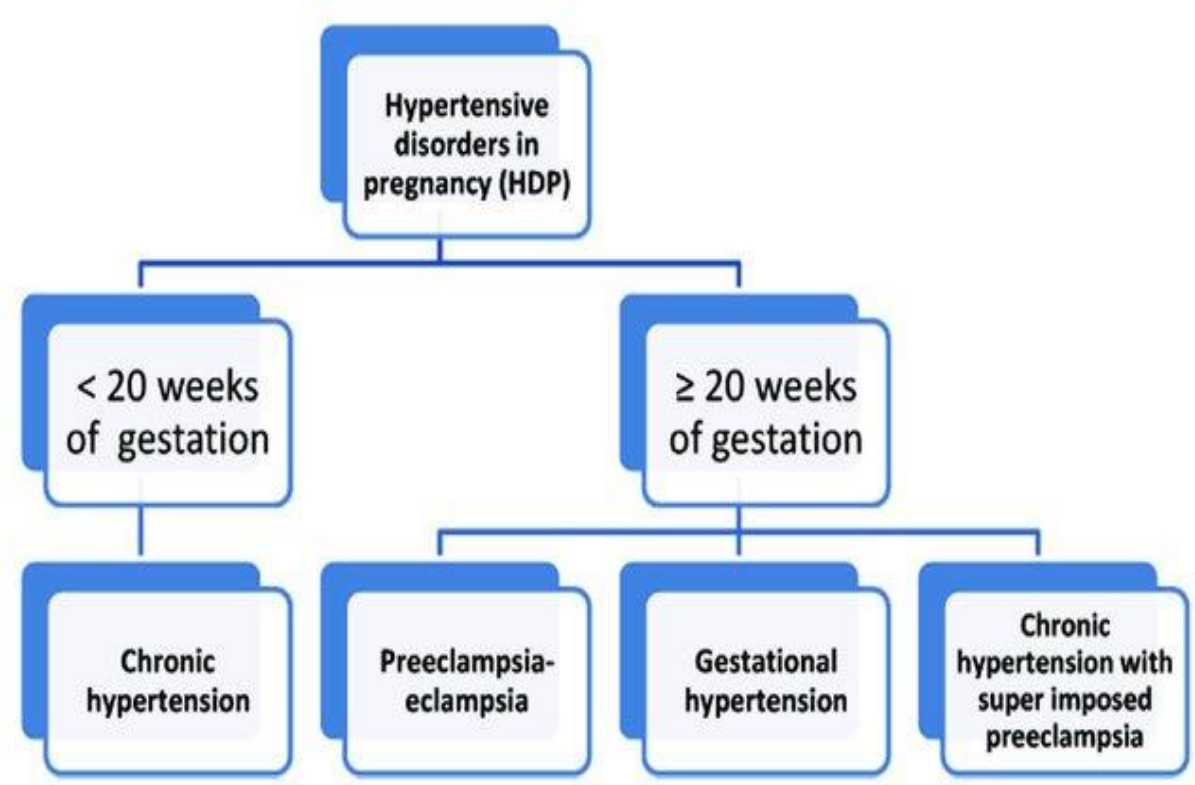

Figure 2 Classification of Hypertension in Pregnancy (8)

Signs and Symptoms

In addition to high blood pressure, other signs and symptoms of preeclampsia include too much protein in the urine (proteinuria) or additional symptoms of kidney problems, headache, temporary loss of vision, blurred vision or sensitivity to light, visual disturbances, including abdominal pain. Usually, under the right ribs, nausea or vomiting decreased urination, decreased platelet count (thrombocytopenia), abnormal liver function, lack of fluid in the lungs, sudden weight gain, and inflammation (especially thrombocytopenia), usually accompanied by preeclampsia. However, they occur during normal pregnancy, so obesity and inflammation are not considered reliable symptoms of preeclampsia (9).

Complications

The more severe your preeclampsia and the more likely you are to get pregnant, the greater the risk to you and your baby. Preeclampsia may require labor and delivery. Surgery (Category C) may be required for clinical or obstetric conditions that require immediate delivery. Otherwise, your doctor may recommend a planned vaginal delivery. Your midwife will talk with you about what type of delivery is best for your condition. Complications of preeclampsia can include (10):

Fetal growth restriction: Preeclampsia affects the blood vessels of the placenta. If the placenta doesn't get enough blood, your baby can get enough blood, oxygen, and some nutrients. This can lead to fetal obstruction, low birth weight, or slow growth known as premature birth. Preterm delivery: If you have preeclampsia with serious side effects, you may need to deliver

early to save your health and that of your baby. Premature ejaculation can cause breathing and other problems in your baby. Your healthcare provider will help you understand your time of birth and placental abruption. Preeclampsia increases the risk of separation of the placenta, a condition that separates the inner wall of the uterus before birth. The severe rash can cause severe bleeding, which can be dangerous for you and your baby. Helper syndrome: HELLP syndrome representing hemolysis (destruction of red blood cells), high liver enzymes, and low platelet count syndrome, which can be very dangerous for you and your baby. Symptoms of HELLP syndrome include nausea and vomiting, headache, and upper right abdominal pain. Help syndrome is very dangerous because it represents damage to various organ systems. In some cases, this can occur suddenly before hypertension can be detected or developed without any symptoms (11).

Eclampsia: If eclampsia is not controlled, then eclampsia is eclampsia and can lead to syncope. It is very difficult to predict which patients will have eclampsia so severe that it will cause eclampsia. In general, there are no signs of eclampsia or warning. Eclampsia can have serious consequences for both the mother and the baby, so no matter how far the pregnancy is, the baby needs to be born. Injuries to other organs: Preeclampsia can damage the kidneys, liver, lungs, heart, or eyes, and can cause paralysis or other psychological damage. The severity of other lesions depends on the severity of preeclampsia. Heart disease: Preeclampsia may increase the risk of future heart disease (heart and blood vessels). The risk is even higher if you experience preeclampsia more than once or have a premature birth. To reduce your risk, maintain a healthy weight after childbirth, eat a variety of fruits and vegetables, exercise regularly, and abstain from smoking (12).

Investigations

To diagnose preeclampsia, you must have high blood pressure and one or more of the following problems after the 20th week of pregnancy: protein in the urine (proteinuria), low platelet count, liver dysfunction, and protein-free kidney problems. Symptoms Urine, lung fluid (pulmonary edema), new headache, or visual disturbances; So far, preeclampsia has only been detected in hypertension and urine protein. However, experts now know that you may have preeclampsia, but your urine will never be protein. The blood pressure values are higher than 140/90 mm Hg. A blood pressure reading doesn't necessarily mean you have preeclampsia, however. Your doctor will closely monitor your blood pressure if you experience abnormal blood pressure or blood pressure higher than normal. A second, infrequent blood pressure reading within four hours of the first can confirm your doctor's suspicions of preeclampsia. Your doctor may ask you to learn more about blood pressure and blood and urine tests. Possible Tests If your doctor suspects preeclampsia, you may need certain tests, including (13):

Blood tests

Your doctor will order liver function tests, kidney function tests and measure your platelets to aid in blood clotting (14).

Urine analysis

Your doctor will ask you to collect urine 24 hours a day to measure the amount of protein in your urine. A single urine sample, which measures the amount of protein and creatinine, a chemical present in the urine, can also be used for diagnosis (15).

Fetal ultrasound

Your doctor may also recommend that you keep a close eye on your child's development, usually through ultrasound. Images of your baby taken during the ultrasound scan allow your doctor to estimate the weight of the fetus and the amount of fluid in the uterus (16).

Nonstress test or biophysical profile

The non-stress test is a simple procedure that checks how your baby's heart rate reacts when you move. Biophysical profiling uses ultrasound to measure your baby's breathing, muscle tone, movement, and amniotic fluid volume in the womb (17).

Treatment

One effective treatment for preeclampsia is childbirth. As your blood pressure drops, your risk of fainting, umbilical cord injury, stroke, and excessive bleeding increases. Of course, if it is too early in your pregnancy, the birth will not be perfect for your baby. If you have been diagnosed with preeclampsia. patients will also need regular blood tests, ultrasound, and less accurate tests than expected if they have a problem-free pregnancy (18).

Drugs: Possible treatments for preeclampsia include: Drugs that lower blood pressure. These medications, called antihypertensives, are used to lower dangerously high blood pressure. A blood pressure of 140/90 millimeters of mercury (mmHg) is usually treated. There are many types of antihypertensive medications, but many are not safe to use during pregnancy. Talk to your doctor about whether you need to use antihypertensive medications in your condition to control your blood pressure. Corticosteroids: If you have severe preeclampsia or HELLP syndrome, corticosteroids can temporarily improve liver and platelet function and prolong pregnancy. Corticosteroids can also help your baby's lungs heal within 48 hours. This is an important step in allowing premature babies to live outside of the womb. Anticonvulsants: If you have severe preeclampsia, your doctor may prescribe antidepressants such as magnesium sulfate to prevent the first attack (19).

Rest: In general, rest is recommended for women with preeclampsia. However, research shows no benefit from this practice, which can increase the risk of blood clots and affect your financial and social life. Rest is no longer recommended for many women. Hospitalization: Severe eclampsia may require hospitalization. In hospitals, doctors can regularly perform stress tests and biophysical profiles to monitor the baby's health and measure the amount of amniotic fluid. Lack of amniotic fluid indicates an inadequate blood supply to the baby. Delivery: If you are diagnosed with preeclampsia in late pregnancy, your doctor may recommend preterm delivery. The fact that the cervix begins to dilate (stretch), thin (active), or smooth (mature) can also be a factor in deciding whether to make an incision at any time. In extreme cases, it is impossible to determine the age of the baby or the cervix. If you can't wait, your doctor may immediately resuscitate or order a C-section. During labor, magnesium

sulfate can be given intravenously to prevent seizures. If you need postpartum pain, ask your doctor what to take. NSAIDs such as ibuprofen (Advil, Motrin IB, etc.) and naproxen sodium (Aleve) can increase blood pressure. After giving birth, the other symptoms of high blood pressure and preeclampsia may take some time to go away (20).

Prevention

Researchers continue to find ways to prevent preeclampsia, but no specific strategy has yet been developed. To reduce the risk, reduce salt, change activity, reduce calories, and eat garlic and fish oil. It has been shown that increasing the intake of vitamins C and E is not beneficial. Other studies have reported a link between vitamin D deficiency and an increased risk of preeclampsia. However, some studies have shown a link between vitamin D supplementation and a reduction in the risk of preeclampsia, while others have failed. However, in some cases, the risk of preeclampsia may be reduced (21).

Low-dose aspirin: If you experience some risk factors, such as a history of preeclampsia, multiple pregnancies, chronic hypertension, kidney disease, diabetes, or autoimmune disease, your doctor may recommend a daily low-dose aspirin (81 mg). Twelve years. Weeks pregnant, calcium supplements: In some communities, women with calcium deficiency before pregnancy and those who do not get enough calcium from their diet during pregnancy may benefit from calcium supplements to prevent preeclampsia. However, women in the United States or other developed countries are unlikely to experience calcium deficiency, suggesting that calcium supplements may benefit them. You mustn't take any medications, vitamins, or supplements without first checking with your doctor. Before you get pregnant, especially if you have preeclampsia, it's best to stay as healthy as possible. Lose weight if necessary and make sure other conditions, like diabetes, are managed properly. If you are pregnant, take care of yourself and your baby with daily prenatal care. If preeclampsia is identified early, you and your doctor can work together to prevent complications and make better decisions for you and your child (22).

There is currently no specific way to prevent hypertension. Some factors that cause high blood pressure can be controlled and some cannot. Follow your doctor's instructions for diet and exercise. Other ways to prevent high blood pressure during pregnancy include: Use salt as needed, drinking at least 8 glasses of water a day, increasing the amount of protein you eat, and limiting the number of fried foods, but reducing it, and getting enough rest. Exercise regularly, increase your legs several times a day, avoid alcohol, avoid caffeinated beverages, and your doctor may prescribe medications and supplements (23).

Discussion

Hypertension during pregnancy is defined as a blood pressure of 140/90 mm Hg. Korotkoff Class V (disappearance) is used in place of Korotkoff Phase IV to determine DBP. In the case of outpatient treatment, blood pressure should be measured by sitting quietly after a short rest. In hospitalized patients, the effect of inferior vena cava compression by an enlarged uterus lying on their side is eliminated, which prevents the return of veins and causes a decrease in blood pressure. Regardless of the posture, special care should be taken to keep the patient's

hands at heart level. Wrap your arms around your heart to significantly lower your blood pressure. During pregnancy, low blood pressure is achieved by using the right arm while the patient is lying on his left side. This blood pressure test can only show changes in the hydrostatic pressure that is caused by placing the right hand on the heart. Therefore, an increase in blood pressure from dorsal to dorsal side may only represent a postural event and not a positive effect on rollover tests, which were considered preeclampsia. The National High Blood Pressure Education Program (NHBPEP) Working Group recently released another report that looks at the classification of high blood pressure during pregnancy. The term "temporary hypertension" has been replaced by "pregnancy hypertension", which is used only during pregnancy in a group of women who develop hypertension after 20 weeks of pregnancy without proteinuria (24).

Conclusion

The main goal of treating high blood pressure during pregnancy is to give birth to a healthy baby without jeopardizing the health of the mother. Early diagnosis and close monitoring of the mother and foetation are required. Without proteinuria, hypertension is generally healthy and easy to control. Antihypertensive drugs should be used with caution and the risk to the fetus from uterine infections should be carefully assessed. Severe preeclampsia is an emergency delivery and can have fatal consequences for the fetus and mother. Ideally, these women should be hospitalized and treated with rest, antihypertensive drugs, and magnesium sulfate to prevent seizures. Direct treatment of preeclampsia at birth: For milder forms farther away, it is desirable to correct the prognosis of the baby by postponing birth.

Conflict of Interest

There is nothing to disclose

References

1) Garg AX, Nevis IF, McArthur E, Sontrop JM, Koval JJ, Lam NN, Hildebrand AM, Reese PP, Storsley L, Gill JS, Segev DL, Habbous S, Bugeja A, Knoll GA, Dipchand C, Monroy-Cuadros M, Lentine KL (January 2015). "Gestational hypertension and preeclampsia in living kidney donors". N. Engl. J. Med. 372 (2): 124–33.
2) Abrams ET, Rutherford JN (2011). "Framing postpartum hemorrhage as a consequence of human placental biology: an evolutionary and comparative perspective". Am Anthropol. 113 (3): 417–30.
3) Cross JC (2003). "The Genetics of Pre-eclampsia: A Feto-placental or Maternal Problem?". Clinical Genetics. 64 (2): 96–103.
4) Jauniaux E, Poston L, Burton GJ (2006). "Placental-related diseases of pregnancy: Involvement of oxidative stress and implications in human evolution". Hum. Reprod. Update. 12 (6): 747–55.
5) Robertson WB, Brosens I, Dixon G (1976). "Maternal uterine vascular lesions in the hypertensive complications of pregnancy". Perspect Nephrol Hypertens. 5: 115–27.
6) Rockwell LC, Vargas E, Moore LG (2003). "Human physiological adaptation to pregnancy: inter- and intraspecific perspectives". Am. J. Hum. Biol. 15 (3): 330–41.

7) Hollegaard B, Byars SG, Lykke J, Boomsma JJ (2013). "Parent-offspring conflict and the persistence of pregnancy-induced hypertension in modern humans". PLOS ONE. 8 (2): e56821. Bibcode:2013PLoSO...856821H.
8) Rosenberg Karen R.; Trevathan Wenda R. (2007). "An Anthropological Perspective on the Evolutionary Context of Preeclampsia in Humans". Journal of Reproductive Immunology. 76 (1–2): 91–97.
9) Moll W, Künzel W (January 1973). "The blood pressure in arteries entering the placentae of guinea pigs, rats, rabbits, and sheep". Pflügers Arch. 338 (2): 125–31.
10) Olofsson P, Laurini RN, Marsál K (May 1993). "A high uterine artery pulsatility index reflects a defective development of placental bed spiral arteries in pregnancies complicated by hypertension and fetal growth retardation". Eur. J. Obstet. Gynecol. Reprod. Biol. 49 (3): 161–8.
11) Solomon CG, Seely EW (February 2001). "Brief review: hypertension in pregnancy : a manifestation of the insulin resistance syndrome?". Hypertension. 37 (2): 232–9.
12) Martin RD (August 2003). "Human reproduction: a comparative background for medical hypotheses". J. Reprod. Immunol. 59 (2): 111–35.
13) Chaline J (August 2003). "Increased cranial capacity in hominid evolution and preeclampsia". J. Reprod. Immunol. 59 (2): 137–52.
14) Duckitt K, Harrington D (March 2005). "Risk factors for pre-eclampsia at antenatal booking: systematic review of controlled studies". BMJ. 330 (7491): 565.
15) Norwitz ER (October 2006). "Defective implantation and placentation: laying the blueprint for pregnancy complications". Reprod. Biomed. Online. 13 (4): 591–9.
16) Rosenberg KR, Trevathan WR (December 2007). "An anthropological perspective on the evolutionary context of preeclampsia in humans". J. Reprod. Immunol. 76 (1–2): 91–7.
17) Cole LA (November 2009). "hCG and hyperglycosylated hCG in the establishment and evolution of hemochorial placentation". J. Reprod. Immunol. 82 (2): 112–18.
18) Lo, JO; Mission, JF; Caughey, AB (April 2013). "Hypertensive disease of pregnancy and maternal mortality". Current Opinion in Obstetrics and Gynecology. 25 (2): 124–32.
19) Brown CM, Garovic VD (March 2014). "Drug Treatment of Hypertension in Pregnancy". Drugs. 74 (3): 283–296.
20) Barton JR, O'brien JM, Bergauer NK, Jacques DL, Sibai BM (April 2001). "Mild gestational hypertension remote from term: progression and outcome". Am. J. Obstet. Gynecol. 184 (5): 979–83.
21) Berhan, Yifru; Berhan, Asres (June 2015). "Should magnesium sulfate be administered to women with mild pre-eclampsia? A systematic review of published reports on eclampsia". The Journal of Obstetrics and Gynaecology Research. 41 (6): 831–842.
22) Sibai, Baha M. (February 2005). "Diagnosis, prevention, and management of eclampsia". Obstetrics and Gynecology. 105 (2): 402–410.
23) Stone, J. H. (1998-08-12). "HELLP syndrome: hemolysis, elevated liver enzymes, and low platelets". JAMA. 280 (6): 559–562.

24) Sibai, Baha M. (May 2004). "Diagnosis, controversies, and management of the syndrome of hemolysis, elevated liver enzymes, and low platelet count". Obstetrics and Gynecology. 103 (5 Pt 1): 981–991.