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Preeclampsia
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Introduction
• Preeclampsia is a complication of pregnancy that if left untreated could result in maternal and/or fetal death.
• Preeclampsia is a pregnancy-specific, multisystem disorder that affects three to five percent of all pregnancies. (Moncrieff, 2018).
• Preeclampsia affects the kidneys, liver, vasculature, and brain. (Moncrieff, 2018).
• In developed countries, access to antenatal care has significantly improved maternal and fetal outcomes, however, in underdeveloped countries, preeclampsia remains a big problem.
• Preeclampsia is likely underdiagnosed due to under reporting in low-income areas (Murray et al., 2018).

Pathophysiology
• The pathophysiology of preeclampsia is thought to originate in the placenta, during the establishment of the uteroplacental circulation (Moncrieff, 2018).
• Under circumstances, normal placental organization occurs during the transformation of maternal spiral arteries from small diameter, high-resistance arteries to low-resistance, high-capacity vessels that can effectively perfuse the intervillous space. (Moncrieff, 2018).
• In preeclampsia, the spiral artery transformation is incomplete. Cytotrophoblasts fail to fully penetrate spiral arteries and many are incompletely transformed or don’t transform at all (Moncrieff, 2018).
• Normally, remodeling of the spiral arteries extends into the myometrium. In preeclampsia, the myometrial portion of the arteries remains unaltered. The unaltered arteries have a thick, muscular wall with a functional adrenergic nerve supply, and are left as high-resistance vessels that provide high-pressure, pulsatile flow to the placentas. Because the blood flow to the placentas may be altered by adrenergic input, it may be under-perfused. This results in placental ischemia-reperfusion injury as a result of oxidative stress (Moncrieff, 2018). Cytokinins and anti-angiogenic proteins are released into the maternal circulation which may affect vascular growth and permeability (Moncrieff, 2018).
• Due to the high blood flow, syncytiotrophoblast particles are also released into maternal blood flow. (Moncrieff, 2018).
• These products of placental tissue are thought to be the cause of maternal endothelial damage, altered homeostasis and coagulation, and increased systemic vascular resistance (Moncrieff, 2018).

Significance
• Severe consequences of preeclampsia include renal failure, pulmonary edema, HELLP syndrome (hemolysis, elevated liver enzymes, low platelets), eclampsia, and maternal/fetal death. (Moncrieff, 2018). About 30% of women will develop hypertension or microalbuminuria within seven years from a pregnancy complicated by preeclampsia (Mayrink et al., 2018).
• Women who have preeclampsia have a significantly higher risk of a myocardial infarction, cerebrovascular accident, or venous thromboembolism (Mayrink et al., 2018).
• Babies born prematurely (specifically before 34 weeks) may suffer from acute respiratory distress syndrome, intraventricular hemorrhage, sepsis, bronchopulmonary dysplasia, and neurodevelopmental delay. (Mayrink et al., 2018).
• Disseminated intravascular coagulation (DIC) can be a complication of preeclampsia/HELLP syndrome. DIC is a life-threatening hemostatic crisis resulting in microvascular thrombosis and uncontrolled bleeding. (Bro, Massaro, & Thach, 2015).

Treatment
• The only known cure for preeclampsia is delivery of the baby.
• Obstetric guidelines recommend that low-dose aspirin therapy be initiated from 12 weeks gestation and continued until delivery for maximum preventative effects for those at risk (Zhu, Huang, Yu, & Zhang, 2018).
• According to the American College of Obstetrics and Gynecology (2018), low-dose aspirin should be given if at least one of the following criteria is met: history of preeclampsia, multigravida, chronic hypertension, diabetes, renal disease, or an autoimmune disease. Aspirin should be considered if more than one of the following criteria are met: nulliparity, obesity (BMI ≥ 30), family history of pregnancy, low socioeconomic status, advanced maternal age, or history of an adverse reaction with a previous pregnancy.
• Magnesium sulfate is a very effective medication in preventing seizure activity in those with severe preeclampsia. The current practice is to administer magnesium during labor for up to 24 hours post-delivery, however, some research may suggest that 6 hours of magnesium post-delivery may be enough. This would help to prevent separation of mother and baby (Aryan, Rajamar, & Bano, 2015).

Nursing Implications
• Education is the most important nursing intervention that can be done to protect mothers and babies, before, during, and after pregnancy.
• Smoking cessation programs are free for all pregnant women, especially those at an increased risk for developing preeclampsia.
• Women with a history of preeclampsia have a three to four times greater risk of developing high blood pressure, and double the risk for heart disease and stroke. (Moncrieff, 2018).
• Education should be focused on the importance of getting at least 30 minutes of cardiovascular activity five days per week, and strength training at least two days per week. (Preeclampsia Foundation, 2016).
• Encourage the importance of following a heart healthy diet, rich in fruits and vegetables, high in fiber, and low in fat (Preeclampsia Foundation, 2016).
• Nurses will provide information on maintaining a healthy body mass index (BMI). (Preeclampsia Foundation, 2016).
• Encourage the public to be knowledgeable about their numbers (blood pressure, blood glucose, and cholesterol).

Conclusion
• Preeclampsia can have profound effects on the physical, emotional, and psychosocial health of women and their families. (Phillips & Boyd, 2016).
• Early identification and treatment of preeclampsia is key to providing mother and baby a safe environment for gestation and delivery.
• Identifying those at a greater risk for developing preeclampsia will aide in better treatment and better outcomes.
• Increasing community outreach programs to provide the underserved areas with increased access to healthcare facilities and education regarding preeclampsia, smoking cessation, and healthy living will help to protect the health of mothers and babies in the future.

References