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Preeclampsia

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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 is one of the leading causes of death and severe maternal morbidity (Mayrink, Costa, & Cecatti, 2018).
- Preeclampsia can affect 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.
- Prevalence is likely underestimated due to under-reporting in low-income areas (Mayrink et al., 2018)

Signs & Symptoms

- New-onset hypertension at or after 20 weeks' gestation (BP \geq 160/110)
- Proteinuria
- Visual disturbances
- Severe Headache
- Epigastric Pain
- Thrombocytopenia
- Altered kidney function
- Altered liver function

Pathophysiology

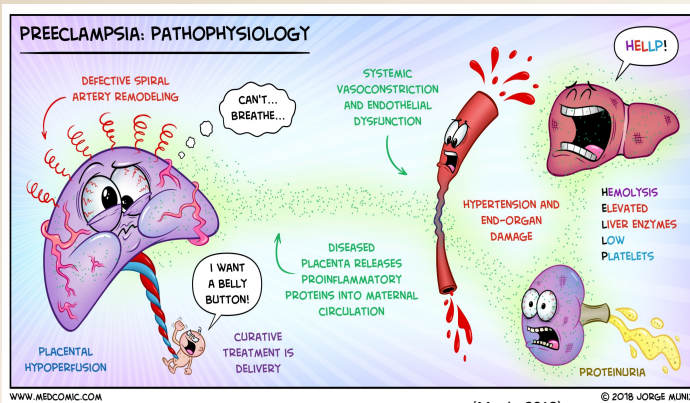
- The pathology of preeclampsia is thought to originate in the placenta, during the establishment of the uteroplacental circulation (Moncrieff, 2018).
- Under healthy circumstances, normal placentation occurs during the transformation of maternal spiral arteries from small-diameter, high-resistance arteries into 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 many arteries may be left 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 placenta. Because the blood flow to the placenta 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).
- Cytokines and anti-angiogenic proteins are released into the maternal circulation which may alter vascular growth and permeability (Moncrieff, 2018).
- Due to the high pressure blood flow, syncytiotrophoblast particles are also released into maternal blood flow (Moncrieff, 2018).
- These products of placental stress 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 20% of women will develop hypertension or microalbuminuria within seven years from a pregnancy complicated by preeclampsia (Mayrink et al., 2018)
- Women who had 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 syndrome, intraventricular hemorrhage, sepsis, bronchopulmonary dysplasia, and neuro-developmental delay (Mayrink et al., 2018)
- Disseminated intravascular coagulation (DIC) can be a complication of preeclampsia/HELLP syndrome. DIC is a life-threatening hematologic crisis resulting in microvascular thrombosis and uncontrolled bleeding (Erez, Mastrolia, & Thachil, 2015).

Treatment

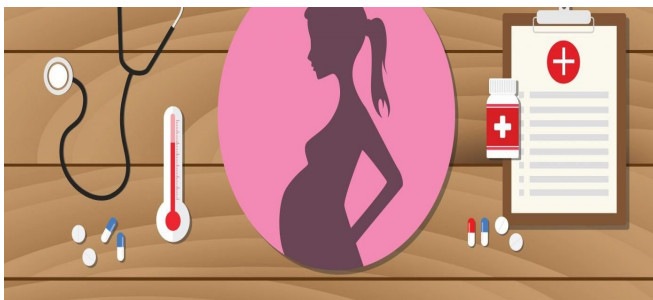
- The only known cure for preeclampsia is delivery of the baby
- Obstetric guidelines recommend that low-dose aspirin therapy be initiated from 12 weeks gestation and continued until delivery for maximum preventative effects for those at risk (Zhu, Huang, Zhang, Ye, & Zhang, 2018).
- According to the 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, multifetal gestation, 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 preeclampsia, 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 and for 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 (Anjum, Rajaram, & Bano, 2015).



(Muniz, 2018)

Nursing Implications

- Education is the most important nursing intervention that can be done to protect mothers and babies, before, during, and after pregnancy.
- Vigilant ongoing assessment should be performed for all pregnant women, especially, those who are at an increased risk for developing preeclampsia.
- Woman 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 (Preeclampsia Foundation, 2016).
- Education should be focused on the importance of getting at least 30 minutes of cardiovascular exercise five days per week, and strength training at least two day 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
- Smoking cessation programs
- Encouraging the public to be knowledgeable about their numbers (blood pressure, blood glucose, and cholesterol)



(Shutterstock, 2019)

Presentation of Case

Amy is a 38 year old primigravida who presented to labor & delivery triage at 36 weeks and 3 days gestation with the following complaints: headache 9/10, blurred vision, and right upper quadrant pain. Amy reports good fetal movement. Vital signs are BP 176/105, HR 105, Temp 98.3, Resp 16. Amy stated she takes 81 mg aspirin daily as well as a prenatal vitamin. Amy states that she has chronic hypertension and has diet controlled gestational diabetes. Amy stated to the physician "I'm supposed to take a medication for my blood pressure but I can't remember what it is and I ran out last month." Amy is admitted to labor and delivery for further monitoring. It is decided that an induction of labor would be the safest option for Amy and her baby. Neuroprotective magnesium sulfate is administered during labor for continued severe range blood pressures, ongoing headache, blurred vision, and epigastric pain. Amy's labor is augmented with Pitocin and after nine hours Amy delivers a 9 lb 2 oz baby boy. The baby is vigorous and crying at delivery, Apgar's are eight at one minute of life and nine at five minutes of life. The baby boy is placed skin-to-skin with Amy in the delivery room. Thirty minutes after delivery, Amy denies any blurred vision or epigastric pain, but still complains of a dull headache 5/10 and has a blood pressure of 162/100. The doctors order Amy to remain on magnesium sulfate for 24 hours post delivery. Due to the frequent monitoring required with magnesium, Amy must remain on the labor and delivery unit while her baby is taken to the well-baby nursery for triage. Amy cannot keep her baby with her as she is alone and drowsy from the magnesium infusion. Twenty-four hours have passed and Amy is moved to the post-partum unit and reunited with her baby. Amy denies any symptoms and now has a blood pressure of 132/88. Amy was started on 30 mg extended release Procardia and will have vital sign checks every 4 hours while in the hospital, she will also have a blood pressure check two weeks postpartum. Amy is prescribed a blood pressure cuff and will monitor her BP at home twice daily.

Conclusion

- Preeclampsia can have profound effects on the physical, emotional, and psychosocial health of women and their newborns (Phillips & Boyd 2016).
- Early identification and treatment of preeclampsia is key in providing mother and baby a safe environment for gestation and delivery.
- Identifying those at a greater risk for developing preeclampsia will aid 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.

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