New Approaches for Preeclampsia: Review of the Literature

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ABSTRACT

Preeclampsia is an important cause of maternal death and complicate 5-10% of pregnancies. The cause involves inadequate cytotrophoblastic invasion of the myometrium and maternal endothelial dysfunction. Preeclamptic women should be monitored and definitive therapy is delivery of the fetus. Hypertension in pregnancy carries risk for future in cardiovascular diseases.

Keywords: Preeclampsia, Pregnancy, HELLP, Hypertension

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Inroduction

Hypertension is also the commonest medical problem during pregnancy and complicates 5-10% of pregancies.[1] There are four categories of hypertensive disorders in pregnancy:

1- Preeclampsia
2- Chronic Hypertension
3- Preeclampsia superimposed on chronic hypertension
4- Gestational Hypertension

Hypertension in pregnancy is associated with increased perinatal and maternal morbidity and mortality like placental abruption, intrauterine growth retardation, prematurity and intrauterine death.[1]

Preeclampsia is a pregnancy specific disorder. The old description of preeclampsia was characterized by hypertension (≥140/90 mm Hg) and proteinuria (≥300 mg in 24 hour urine). The American College of Obstetrics and Gynecologists' (ACOG) Task Force on Hypertension in pregnancy has revised the diagnostic criteria.[2] The new criteria removed the proteinuria as a diagnostic requirement for preeclampsia. Because 14 % of women with preeclampsia do not have proteinuria.[3] Proteinuria is defined by more than 300 mg protein in a 24-h-urine collection or a urinary protein to creatinine ratio 0.3.[2] Intrauterine growth retardation, oliguria were also excluded from the severe preeclampsia description. HELLP and eclampsia were defined again.[1]

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Gestational hypertension occurs after 20 weeks of gestation with or without proteinuri and recovers after postpartum 42nd day.[1]

Chronic hypertension occurs before 20 weeks of gestation and goes on postpartum period.[1]

Etiology and risk factors

The exact etiology of preeclampsia is unknown. But there are some factors in expressing the pathogenesis. Specific histologic changes in the placenta and kidneys, genetic, immunologic factors play role in pathophysiology of preeclampsia. Endothelial dysfunction and vasospasm provoke the clinical symptoms of preeclampsia.[4]

In preeclampsia the trophoblastic invasion into the uterine wall is defective and spiral arteries remain narrowed and resistive. This placental hypoperfusion causes oversecretion of placental antiangiogenic peptides such as fms-like tyrosine kinase 1 (sFlt-1) and soluble endoglin (s Eng). On the otherhand there is underexpression of angiogenic peptides like vascular endothelial growth factor (VEGF), placental growth factor (PlGF), Placental Protein 13 (PP-13) and pregnancy associated plasma protein A (PAPP-A).[5]

Screening of preeclampsia

The pathophysiology is multifactorial, only one marker is not enough to diagnose or screen. Combination of risk factors, biochemical tests and ultrasound can be used to detect preeclampsia earlier. The prediction tool included baseline mean arterial pressure, uterine artery pulsatility index, serum PAPP-A and PlGF concentrations.[6] The detection rate for early onset preecampsia is about 95 %.[7]

Management of preeclampsia

Mild preeclampsia is defined as hypertension by systolic blood pressure (BP) of 140 mmHg or greater and /or diastolic BP of 90 mmHg or greater on at least two occasions more than 4 hour apart while resting with proteinuria or in the absence of proteinuria new onset hypertension with one of the following:

Platelet count below 100 000/µl

Serum creatinine concentration of 1.1 mg/dL or doubling of the serum creatinine concentration in the absence of the other renal disease.

Levels of liver transaminases elevated to twice the normal concentration.

Pulmonary edema.

Cerebral or visual symptoms.[2]

First evaluation of the patient is offered in the hospital by the monitoring of women with serial assessment of maternal symptoms and fetal movement, serial measurements of biophysical profile (BP) twice weekly and assessment of platelet counts and liver enzymes weekly.[1]

For women with mild gestational hypertension or preeclampsia expectant management with maternal and fetal monitoring are suggested.[2]

Beyond 37 weeks of gestation, delivery is suggested.[2]

Severe Preeclampsia: The blood pressure which is greater than or equal to 160 mmHg systolic or greater than or equal to 110 mmHg diastolic is defined in severe preeclampsia.[2]

For women with mild gestational hypertension or preeclampsia with a persistent BP of less than 160 mmHg systolic or 110 mmHg diastolic, antihypertensive medications are not administered.[2]

If the fetus is beyond 34 weeks of gestation, with unstable maternal or fetal conditions or if the fetus is before fetal viability, delivery is offered.[2]

The woman with severe hypertension, the use of antihypertensive therapy is recommended.[2]

It is suggested that corticosteroids be administered and the delivery deferred for 48 hours if maternal and fetal conditions remain stable for women with severe preeclampsia and a viable fetus at 33 6/7 weeks or less of gestation. But if the condition of severe preeclampsia is complicated with any of the following: uncontrollable severe hypertension, eclampsia, pulmonary edema, abruptio placenta, disseminated intravascular coagulation, evidence of nonreassuring fetal status, intrapartum fetal demise delivery is also offered.[2]

For women with severe preeclampsia, the administration of intrapartum-postpartum magnesium sulfate to prevent eclampsia is recommended. Intravenously administered magnesium sulfate has an important role in the prevention of seizures in preeclamptic women by slowing neuromuscular conduction and raising the seizure threshold. A loading dose of 4-6 g is usually put in 100 ml of normal saline and infused 15-20 min, followed by a 2 g/h infusion. The therapeutic magnesium level is 4-7 mg/dL. The antidote of magnesium is calcium gluconate. Magnesium infusion should continue for 12-24 hours postpartum. Magnesium sulfate should not be used for antihypertensive therapy.[8]

For antihypertensive therapy, labetolol, methyldopa and nifedipine are accepted as first line treatment.[9] Slow release nifedipine is the most commonly used calcium channel blocker in pregnancy. Administration of calcium blockers and magnesium sulfate has been avoided because of the synergistic BP effects.[10] Methyldopa can be given 0.5-3 g/day in 2 divided doses, labetolol which is alpha and beta blocker can be used 200-1200 mg/day peroral in 2-3 divided doses.[11,12]

In hypertensive emergencies during pregnancy intravenously administered labetolol, hydralazine or sodium nitroprusside are the medical alternatives. Labetolol can be administered in 20 mg-80 mg or 5-10 mg hydralazine intravenously (IV) over 2 minutes or oral 10-40 mg nifedipine if BP measurement is greater than or equal 160 mmHg or if diastolic BP measurement is greater than or equal to 110 mmHg. None of the antihypertensive drugs are better each other. They can be preffered according to the clinician's experiences.[13-15]

For women in whom preeclampsia is diagnosed, blood pressure should be monitored for at least 72 hours postpartum and 7-10 days after delivery.[2]

It is now clear that preeclampsia is associated with later-life cardiovascular disease, diabetes mellitus, cerebrovascular, thromboembolic diseases.[2] The lifestyle modification such as healthy weight, adequate aerobic physical exercise, optimal diet and avoiding tobacco should be encouraged in women with a history of preeclampsia.[16]

Preeaklampsi için Yeni Yaklaşımlar: Literatürün Gözden Geçirilmesi

ÖZET

Preeklampsi, gebeliklerin %5-10'unda görülen, maternal ölümlerin önemli bir nedenidir. Sebep, miyometriyuma sitotrofoblastik invazyonun yetersiz olması ve maternal endotelyal disfonksiyondur. Preeklamptik kadın monitörize edilmeli ve kesin tedavi fetüsün doğurtulmasıdır. Gebelikteki hipertansiyon, gelecekte kardiyovasküler hastalıklar açısından risk taşımaktadır.

Anahtar Kelimeler: Preeklampsi, Gebelik, HELLP, Hipertansiyon

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