Review Article

A Review of Hypertensive Disorders Management During Pregnancy

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Abstract:

Background: Hypertensive disorders are the second direct cause of maternal death affecting 5 – 10 % of pregnancies. These disorders are associated with increased risk of intracerebral hemorrhage, placental abruption, intrauterine growth retardation, prematurity, and intrauterine death. Chronic hypertension, gestational hypertension, pre-eclampsia, eclampsia, chronic hypertension with superimposed pre-eclampsia are hypertensive disorders in pregnancy.

Methods: Narriative review.

Results: Hypertension control measurement for these conditions includes complete blood count (CBC), serum creatinine (SCr), liver enzymes and 24-h urine protein. Ultrasonographic evaluation of fetus and nonstress test also should be considered. Oral pharmacologic interventions for chronic hypertensin during pregnancy includes Methyldopa, Labetalol and Nifedipine. The use of Angiotensin-Converting Enzyme Inhibitors (ACE-I) and Angiotensin-II Receptor Antagonists could not be used due to teratogenicity. Pre-eclampsia is a disorder which worsens when the pregnancy continues, so the definitive treatment of pre-eclampsia is delivery. The indication for delivery in women with gestational hypertension or pre-eclampsia includes gestational age ≥ 27 weeks, uncontrollable hypertension, persistent neurological symptoms or eclampsia, deteriorating liver and renal function, placental abruption, acute pulmonary edema, persistent epigastric pain with nausea or vomiting with abnormal liver function tests and severe FGR.

Conclusion: Hypertensive disorders in pregnancy could increase the risk fetal and maternal mortality. Therefore, early detection and proper management of hypertension needs to be done in pregnant women.

Keywords: Hypertension, Pregnancy, Pre-eclampsia, Pregnancy Hypertensive Disorders

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Introduction

Hypertensive disorders during pregnancy are the second direct cause of maternal death, affecting 5 – 10 % of pregnancies as the most common complication (1-3). Hypertensive disorders account for 9% of maternal deaths in Asia and Africa over 25% in Latin America and Caribbean (4). These disorders are associated with increased risk of intracerebral hemorrhage, placental abruption, intrauterine growth retardation, prematurity, and intrauterine death (5). These complication includes chronic hypertension, pre-eclampsia, gestational hypertension and chronic hypertension with superimposed pre-eclampsia (6).

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The diagnosis of hypertension disorders during pregnancy is made by systolic blood pressure (BP) 140 mmHg or higher or diastolic BP of 90 mmHg or higher on at least to two measurements with 4 hours apart (7, 8). However, the pre-existing hypertension could be undiagnosed due to reduction in BP in first and second trimester.

Given the potentially life-threatening condition caused by hypertension disorders, we aimed to review the management of hypertensive disorders during pregnancy in this study.

Hypertensive disorders classification

Chronic hypertension

Chronic hypertension is defined by BP 140/90 mmHg or higher presents before pregnancy, prior to 20 weeks of gestational age or existing after 42nd postpartum day (7, 9). This condition affects 3-5% of pregnancies (10, 11). While the prevalence of chronic hypertension is increasing, this condition is well tolerated in most pregnancies however it can lead to superimposed preeclampsia, fetal growth restriction and placental abruption (12).

Gestational hypertension

Gestational hypertension is being defined as BP over 140/90 mmHg after 20 weeks of gestation in a previously normotensive patient (9). It affects 2-3 % of pregnancies in USA and has been increasing in the last decades from 10.7 to 30.6 in 1000 deliveries (13).

Pre-eclampsia

Pre-eclampsia is being defined as hypertension beyond 20 weeks of gestation with 300 mg proteinuria in 24-hour urine collection or protein to creatinine ration over 0.3 (8). There several risk factor contributing to pre-eclampsia including history of pre-eclampsia, chronic hypertension, pregestational diabetes, antiphospholipid syndrome and etc. (14). The pathophysiology of pre-eclampsia is mainly ambiguous however the role of placenta at the main provoking factor leading to vasodilation and endothelial dysfunction, has been accepted (15).

Eclampsia

Eclampsia is being defined as generalized tonic-clonic seizures in a pregnant patient with previous pre-eclampsia (9). Eclampsia is the direct cause of 10-15% maternal mortality along with pre-eclampsia (16).

Chronic hypertension with superimposed pre-eclampsia

The occurrence of pre-eclampsia or eclampsia in a patients diagnosed with chronic hypertension after 20 weeks of gestation is being defined as chronic hypertension with superimposed pre-eclampsia (9).

Management of hypertensive disorders in pregnancy

All women who diagnosed with hypertension during pregnancy should be evaluated by complete blood count (CBC), serum creatinine (SCr), liver enzymes and 24-h urine protein. Ultrasonographic evaluation of fetus and nonstress test also should be considered.

Chronic hypertension

Hypertensive women diagnosed with chronic hypertension should be evaluated for signs of end-organ damage. Initial evaluation includes 24-h urine for total protein and creatinine clearance, renal panel or serum electrolytes, serum creatinine, liver enzymes, uric acid, platelet count, ophthalmoscopy or ophthalmology

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consult, electrocardiogram and cardiology consult if there is an abnormal electrocardiogram. Proper BP control needs to executed after diagnosing the etiology of chronic hypertension. Screening the renal function is also necessary in these patients.

As the risk of fetal growth restriction increases in women with chronic hypertension (17), proper ultrasonographic monitoring is required. In case that evidence suggests fetal growth restriction, assessment of the fetoplacental status using umbilical artery velocimetry is recommended.

Oral pharmacologic interventions for chronic hypertensin during pregnancy includes Methyldopa, Labetalol and Nifedipine. The use of Angiotensin-Converting Enzyme Inhibitors (ACE-I) and Angiotensin-II Receptor Antagonists could not be used due to teratogenicity (18). Atenolol, a bet-a blocker is also contraindicated due to Intrauterine Growth Restriction (IUGR) (19).

Pre-eclampsia and gestational hypertension

All patients with hypertension after 20 weeks of pregnancy should evaluated for proteinuria, CBC, SCr, liver enzymes, urea and fetal growth, amniotic fluid volume and umbilical artery flow using sonography (20).

Pre-eclampsia is a disorder which worsens when the pregnancy continues, so the definitive treatment of pre-eclampsia is delivery (20). The indication for delivery in women with gestational hypertension or pre-eclampsia includes gestational age ≥ 27 weeks, uncontrollable hypertension, persistent neurological symptoms or eclampsia, deteriorating liver and renal function, placental abruption, acute pulmonary edema, persistent epigastric pain with nausea or vomiting with abnormal liver function tests and severe FGR (20, 21).

In cases of preterm pre-eclampsia (before 34 weeks), the delivery should be delayed by 24 to 48 hours along with corticosteroid administration to accelerate lung maturation. Magnesium sulfate could also be beneficial for neurological protection of the fetus (20).

All patients with systolic BP higher than 160 mmHg or diastolic BP over 100 mmHg should be administered with antihypertensive medications as the risk of intracerebral hemorrhage and eclampsia increases (1, 22, 23).

The first line medications for pre-eclampsia includes methyldopa, labetalol and oxprenolol continued by second line drugs including hydralazine, nifedipine and prazosin (20). As mentioned before the use ACE-I are contraindicated during pregnancy due to increased risk of fetal death.

In patients with severe hypertension, systolic BP higher than 170 mmHg or diastolic BP higher than 110 mmHg, urgent blood pressure lowering medications are indicated. These interventions includes Labetalol 20-80 mg, Nifedipine 20-80 mg (24), Hydralazine 10 mg (25) and Diazoxide 15-45 mg (26).

Eclampsia

Patients having eclampsia should be managed in four aspects. As the seizure occurs proper airway management and ventilation should be addressed. Seizures are usually self-limiting however in case of prolonged seizure intravenous clonazepam or diazepam should be administered. After the seizure, administration of magnesium sulfate with 4 gr loading dose followed by an infusion could be beneficial. Controlling hypertension below the 160/110 mmHg is

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also essential. After the patients become stable delivery should be considered.

Conclusion

In conclusion hypertensive disorders in pregnancy could increase the risk fetal and maternal mortality. Therefore, early detection and proper management of hypertension needs to be done in pregnant women.

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