

Pre-eclampsia: A hypertensive Disorder During Gestation

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Abstract

Maternal and child health is one of the major components of global health. Health disorders during gestation may leads to various disease conditions in mother and fetus. Hypertension during pregnancy can develop Preeclampsia and eclampsia in later stages of gestation. Incidence of preeclampsia is comparatively higher in developing countries. In India, incidence of preeclampsia ranges between 2–10%. Prevalence of preeclampsia is more common among rural women compare to urban women. Increased blood pressure during gestation can affect the maternal and fetal outcomes of the pregnancy. Prompt actions like medication, lifestyle modification, exercises and dietary changes are needed to control the disease condition. Magnesium sulphate has significant effect on eclampsia management. It is necessary to reduce the prevalence of preeclampsia among the pregnant women. Preeclampsia can increase the morbidity and mortality among Mother and their fetus. Early diagnosis and management of the maternal hypertension and eclampsia is needed to reduce the disease burden.

Keywords: Preeclampsia; Maternal Hypertension; Hypertensive disorder; Gestation, Prevention; Management.

Introduction

Maternal health is a major challenge for developing countries. Pre-eclampsia is one of the major causes of maternal and fetal morbidity and mortality. The incidence of pre-eclampsia is 7 times higher in developing countries as compare to developed countries.¹ In India, incidence of pre-eclampsia ranges between 2–10%. Prevalence of pre-eclampsia is more common among rural women compare to urban women. Pre-eclampsia is a life threatening

complication of pregnancy that also known as pregnancy-induced hypertension typically starts after 20th week of pregnancy and is related to increased blood pressure (BP \geq 140/90 mm Hg) and protein in mother's urine (urinary albumin protein \geq 300 mg/24 h). Pre-eclampsia further categorised mild to severe range. Women with pre-eclampsia symptoms vary from condition like a woman with mild pre-eclampsia generally have no symptoms. Where as severe pre-eclampsia women have symptoms such as headache, upper abdominal

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pain, or visual disturbances.²⁻⁴ Pre-eclampsia can lead to various complications both for the mother and the baby. Pre-eclampsia is a direct and specific cause of maternal morbidity and mortality. Pre-eclampsia can lead to various complications both for the mother and the baby. The baby born from pre-eclampsia mother has a greater risk to suffer from Intra Uterine Growth Restriction (IUGR) and are small for Gestational Age (SGA). Sometime this baby also has a risk of coronary heart disease, metabolic syndrome and cerebrovascular attack during adult life. Pre-eclampsia mothers have also a risk to develop some disease like chronic hypertension, ischemic heart disease.⁵⁻⁸ Pre-eclampsia is strongly correlated with certain risk factors like a history of previous pre-eclampsia or the presence of disorders such as chronic hypertension and diabetes. Sometime it is also related with certain disorders like thrombophilic disorders and the insulin resistance syndrome. In addition, lifestyle-associated factors such as length of sexual cohabitation preceding pregnancy, getting pregnant by a new partner and some pregnancy-related risk factors like molar pregnancies, and urinary tract infections, multiple pregnancies.⁹ Numerous risk factors for pre-eclampsia have been suggested like body mass index, systolic blood pressure, diastolic blood pressure, African-American race, other non-white race, smoking since last menstrual period were significantly associated with pre-eclampsia.¹⁰ Pre-eclampsia is a syndrome specific to pregnancy that affects many organ systems and is acknowledged by new onset of hypertension and Proteinuria after 20 weeks of gestation. Although the cause is unknown, the pathophysiologic processes underlying this disorder are described as occurring in two stages.⁵ The first stage having reduced placental perfusion and the second stage refers to the maternal systemic manifestations characterized by inflammatory, metabolic, and thrombotic responses that converge to alter vascular function, which can result in multi-organ damage.¹¹⁻¹² Hypertensive disorders during pregnancy are classified into following categories, 1) chronic hypertension, 2) pre-eclampsia-eclampsia, 3) pre-eclampsia superimposed on chronic hypertension, and 4) gestational hypertension (transient hypertension of pregnancy or chronic hypertension identified in the latter half of pregnancy).¹³ Chronic hypertension is characterized by increased blood pressure before 20 weeks or hypertension persistent for more than 12 weeks after pregnancy. Chronic hypertension leads to approximately 1% of pregnancy complications where as 5-6% pregnancy complication due to gestational hypertension (without Proteinuria), and 3-6% by pre-eclampsia.¹⁴ Chronic hypertension

may develop adverse in maternal as well as fetal outcomes. Management of chronic hypertension is done in an outpatient setting by strictly controlling maternal blood pressure (BP, 110-140/85 mm Hg), monitoring fetal growth. Hypertension presenting beyond 20 weeks of gestation with Proteinuria at least 300 mg/24 hr urine collection or 1+ (0.3 g/l) on urine dipstick and eclampsia is the occurrence of seizures in a pregnant woman with pre-eclampsia and it leads approximately 3-6% pregnancy complicated by pre-eclampsia. Superimposed pre-eclampsia occurs in women already diagnosed with chronic high blood pressure before pregnancy, but then develop severe high blood pressure and protein in the urine or other health complications during pregnancy.¹⁵ Gestational hypertension is defined by BP readings of $\geq 140/90$ mm Hg on two occasions at least 4 hours apart during pregnancy after 20 weeks' gestation in a previously normotensive patient, without the presence of other clinical features of pre-eclampsia. Gestational hypertension increases the possibility of macrosomia, caesarean delivery, and admission of the neonate to the intensive care unit.¹⁶ The diagnosis of hypertension among pregnant women should be based on a diastolic BP of 90 mm Hg and systolic BP of 140 mm Hg based on the average of at least two measurements, taken using the same arm. White coat hypertension is another type of hypertension and its measurement should be defined as office diastolic BP of 90 mm Hg, but home BP of $< 135/85$ mmHg. Proteinuria should be assessed by urinary dipstick testing and this may be used for screening for Proteinuria. Sometime it's giving false reading also. For confirmation of proteinuria by urinary protein: creatinine ratio or 24-hour urine collection. Clinically Significant Proteinuria is defined as 0.3 g/d in a 24-hour urine collection or 30 mg/mmol urinary creatinine in a spot (random) urine sample. The first voided morning specimen should not be used as it has less reliability.¹⁷

Prevention and management of Pre-eclampsia

The causative factors of pre-eclampsia are still debatable and broadly unknown. Hence, it is difficult to develop strategies for prevention of pre-eclampsia. Risk factors for pre-eclampsia are advanced maternal age, obesity, and under utilization of prenatal care. Anti-platelet agents, especially low-dose aspirin, have small benefits when used for prevention of pre-eclampsia. A meta-analysis that assessed the effect of starting aspirin before 16 weeks of gestation found a 52% reduction in the risk of pre-eclampsia, however no

significance difference was observed when started after 16 weeks. Calcium supplement during the pregnancy has significant effect on prevention of pre-eclampsia.¹⁸ Early management of pre-eclampsia is crucial in declining maternal and fetal mortality and morbidity. The primary goal of managing pre-eclampsia is to keep blood pressure of woman in the normal range with anti-hypertensives and prevent the development of complications like eclampsia. Delivery of the foetus and placenta is the only definitive treatment for pre-eclampsia. In most of pre-eclampsia cases, diagnosis is finalized in later stage of the disease. Before 34 weeks of gestation, the management goals are maternal hypertension is within normal range, and maternal organ dysfunction or fetal distress should be absent. There is no clear drug of choice for maternal hypertension. Magnesium sulphate is the drug of choice for not only prevention of eclampsia but also management eclampsia. Lifestyle medications and dietary changes are needed to minimize the hypertension during the pregnancy.¹⁹⁻²⁰

Conclusion

Maternal and fetal health is important for every nation. Complications during pregnancy lead to morbid and fatal conditions to pregnant woman and her foetus. Pre-eclampsia is one of the major complications during pregnancy. It is associated with increased blood pressure and Proteinuria. Pre-eclampsia is more common among developing countries compare to developed countries. Pre-eclampsia is strongly correlated with certain risk factors like a history of previous pre-eclampsia or the presence of disorders such as chronic hypertension and diabetes some time it also related with certain disorder like thrombophilic disorders and the insulin resistance syndrome. In addition lifestyle-associated factors such as length of sexual cohabitation preceding pregnancy, getting pregnant by a new partner and some pregnancy related risk factors molar pregnancies, and urinary tract infection, multiple pregnancies. Prevention of pre-eclampsia in early stage is important. It can be minimized by use of calcium supplements and lifestyle modifications. Magnesium sulphate has a significant role in prevention and management of eclampsia. Early detection and management of pre-eclampsia can reduce the severity of the disease. Regular antenatal visits are necessary for the detection and management of the disease. Orientation and awareness regarding pre-eclampsia can decline the fatal outcomes of eclampsia. It can

also reduce the maternal and fetal morbidity and mortality.

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