

Pregnancy Induced Hypertension and its Management

D Subedi

Department of Midwifery, T U, IOM, Nursing Campus, Maharajgunj, Kathmandu, Nepal

Correspondence to: **Ms Durga Subedi**,

Email: durgasubedi2014@yahoo.com.

Abstract

Pregnancy induced hypertension which occurs after 20 weeks gestation, in labour or within 48 hours of delivery. The mortality is closely associated with the severity of hypertension, being more evident in patients with eclampsia. Neonatal and infant mortality rates are consistently higher in preterm infants than in term infants. Preeclampsia and eclampsia can lead to higher frequency of induced labor, fetal growth restriction, neonatal respiratory difficulties, and increased frequency admission to neonatal intensive care unit. Early detection and prevention of maternal hypertensive disorder is important in order to avoid morbidity and mortality. Education about the warning symptoms is also important because early recognition may help women receive treatment and prevent worsening of the disease.

Introduction

Women with pregnancy induced hypertensive disorder may progress from mild disease to a more serious (life threatening) condition. If hypertension occurs after 20 weeks of gestation, during labour and/or within 48 hours of delivery it is classified as pregnancy induced hypertension. The classes of pregnancy induced hypertension are hypertension without proteinuria, mild pre eclampsia, severe preeclampsia, and eclampsia¹. The hypertensive disorders of pregnancy encompass a variety of conditions featuring an elevation of maternal blood pressure with a corresponding risk to maternal and fetal well being. The blood pressure considered in pregnancy induced hypertension should be more than 140/90 mm of Hg or more on two consecutive readings taken four hours apart. If previous blood pressure is known an increment of 30 mm of Hg systolic and 15 mm of Hg diastolic is also considered. Diastolic blood pressure is more important.

Hypertensive disorders which include preeclampsia/eclampsia, represent a significant proportion of maternal deaths worldwide. Such deaths account 9.1%, 9.1% and 25.7% in Sub-Saharan Africa, South Asia, and Latin America respectively². The maternal mortality rate is as high as 14% in developing countries. In Nepal, maternal death due to eclampsia accounts for 14%³. Nepal maternal mortality and morbidity study 2008-09 showed that preeclampsia / eclampsia is the second most common cause of maternal mortality⁴. Maternal mortality in eclampsia is very high in India and varies from 2-30 %, much more in rural based hospital than in the urban counterpart. However, if treated early and adequately, the mortality should be even less than 2%⁵.

Hypertensive disorders of pregnancy are an important cause of severe morbidity, long-term disability and death among both mothers and their babies. Among the hypertensive disorders that complicate pregnancy, pre-eclampsia and eclampsia stand out as major causes of maternal and perinatal mortality and morbidity. The majority of deaths due to pre-eclampsia and eclampsia are avoidable through the provision of timely and effective care of the women presenting with these complications. Optimizing health care to prevent and treat women with hypertensive disorders is a necessary step towards achieving the millennium development goals. WHO developed the present evidence-informed recommendations with a view to promoting the best possible clinical practices for the management of pre-eclampsia and eclampsia⁶.

Etiology of high blood pressure in pregnancy

The etiology of high blood pressure in pregnancy is not known. What is known is, with increased maternal blood pressure, fluid moves from the vascular system to the extravascular spaces and blood becomes hemoconcentrated with a decreased renal plasma flow and glomerular filtration rate. An elevated blood pressure in pregnancy and the subsequent vasoconstriction will reduce uteroplacental perfusion with alterations in fetal growth. In preeclampsia, trophoblastic invasion of the spiral arteries is thought to be inhibited resulting in decreased placental perfusion, which may ultimately lead to early placental hypoxia and oxidative stress⁷. The subsequent maternal systemic inflammatory response and endothelial cell dysfunction results in the clinical signs of preeclampsia which is seen after 20 weeks



gestation. Coagulation abnormalities, abnormal trophoblast invasion, and dietary factors, immunologic factors and genetic disposition may also play an important role in the etiology of hypertension in pregnancy. The genetic roots of gestational hypertension and preeclampsia are certain as women with a family history of the condition are three times more likely to suffer from it when they are pregnant⁸. Dietary aspects have also been considered, and some studies suggest that there is a link between low dietary calcium and pre eclampsia⁹.

Effect of pregnancy induced hypertension

There are significant adverse maternal effects, some resulting in serious maternal morbidity and death. Maternal death is largely following complications from abruption placentae, hepatic rupture and eclampsia¹⁰. High blood pressure can harm mother's kidney and other organs. It must be remembered that placental abruption, acute renal failure, liver failure, intracerebral haemorrhage, and pulmonary edema will also have a adverse effect on the fetus. With high blood pressure, there is an increase in the resistance of blood vessels. This may hinder blood flow in many different organ systems in the expectant mother including the liver, kidneys, brain, uterus and placenta. There are other problems that may develop as a result of pregnancy induced hypertension. Placental abruption may occur in some pregnancies. If untreated, severe pregnancy induced hypertension may cause dangerous seizures and even death in the mother and fetus.

There is increased risk of perinatal mortality, and morbidity due to placental dysfunction. Complication such as intrauterine growth restriction, intrauterine hypoxia and intrauterine fetal death may occur. Overall perinatal mortality is increased fivefold in patients of preeclampsia with iatrogenic prematurity being the main cause^{5,11}, not only because of these conditions but also prematurity as early delivery is often necessary for severe preeclampsia and eclampsia¹². Preeclampsia significantly increases the risk of iatrogenic preterm birth for maternal indications. Neonatal and infant mortality rates are consistently higher in late preterm infants than in term infants. Infants born between 34 to 36 weeks gestation were labeled as near term infants and were believed to be at a low risk for significant morbidities¹³. Several studies have shown that late preterm infants are at increased risk for respiratory distress syndrome, transient tachypnea of the newborn, persistent pulmonary hypertension, and respiratory failure compared to term infant. The increased incidence of perinatal morbidity and mortality seen in pregnancies complicated by preeclampsia, although complex and multifactorial, is primarily due to the need for premature delivery and uteroplacental insufficiency resulting in a compromise of blood flow to the fetus. It is intuitive that reduced placental

blood flow should result in decreased fetal growth, with an increased risk of intrauterine growth restriction and low birth weight. Severe preeclampsia represents significant risk factor for intrauterine fetal demise with estimated stillbirth rate of 21 per 1000¹⁴. In Nepal still birth, cause of deaths could not ascertained in 35% cases followed by intrauterine asphyxia 34%, hypertensive disorder 14%¹⁵.

The perinatal mortality is very high due to prematurity (spontaneous or induced), intra uterine asphyxia due to placental insufficiency arising out of infarction, retroplacental haemorrhage and spasm of uteroplacental vasculature, effects of the drugs used to control convulsions, trauma during operative delivery. The effect of chronic and controlled hypertension in pregnancy on the fetus is minimal. However, preeclampsia and eclampsia can lead to higher frequency of induced labor, fetal growth restriction, neonatal respiratory difficulties, and increased frequency admission to neonatal intensive care unit. Hypertension in pregnancy, even in its more severe forms, causes only minimal increased risk for perinatal or fetal death. Though hypertension in pregnancy, preeclampsia is usually though of as a short term problem that resolves itself with delivery, it still carries significant risk for remote complications. Those infants born small and premature may experience prolonged stays in neonatal intensive care units and often face developmental delays.

Management of pregnancy induced hypertension

Detection and prevention of maternal hypertensive disorder is important in order to avoid morbidity and mortality associated with them ¹⁶. Education about the warning symptoms is also important because early recognition may help women receive treatment and prevent worsening of the disease. Patient must be monitored closely for blood pressure and urine protein testing is a key clinical test to detect preeclampsia. The position of the woman in whom the blood pressure is measured is important in pregnancy. The supine and right lateral positions are not recommended in view of the effect of the gravid uterus on venous flow resulting in postural hypotension. Women should be seated or lying in the left lateral position at an angle of 45 degree, with the sphygmomanometer cuff approximately level with the heart⁵.

Aspirin is most effective when low doses are given to women considered at higher risk of developing preeclampsia. The society of obstetricians and gynaecologists of Canada recommends low dose aspirin (75mg/d) at bedtime for high risk women¹⁸. There is a little evidence to support dietary intervention for preventing or restricting the advance of pre eclampsia. As for any pregnant women, a diet rich in protein, fiber and vitamins may be recommended. There is some evidence to suggest that prophylactic fish oil in pregnancy may act as an anti platelet agent, thereby



preventing hypertension and pre-eclampsia. Calcium supplementation has also been investigated and appears to be beneficial for women at high risk of developing hypertension in pregnancy and in communities with low dietary calcium intake¹⁹. If there are signs of severe fetal growth restriction or fetal compromise, admit the women to the hospital for assessment and possible expedited delivery. Counsel the women and her family about danger signals indicating preeclampsia or eclampsia.

The only definitive cure for preeclampsia is delivery of the fetus and placenta. Given the progressive nature of the disorder, delivery is often necessary to minimize maternal morbidity and mortality. On the other hand, one of the primary goals of obstetricians is to deliver infants who are functionally mature and capable of adapting to the extra uterine environment without the need for intensive care²⁰. In addition, delivery is recommended for all women with severe preeclampsia no later than 34 weeks gestation²². The decision to deliver should be made once the woman is stable and with appropriate senior personnel present. If the fetus is less than 34 weeks of gestation and delivery can be deferred, corticosteroids should be given, although after 24 hours the benefits of conservative management should be reassessed. Conservative management at very early gestation may improve the perinatal outcome but must be carefully balanced with maternal well being. Administration of corticosteroids for as few as 12-24 hours before delivery has been shown to decrease morbidity and improve survival rates of infants born before 34 weeks gestation. The mode of delivery should be determined after considering the presentation of the fetus and the fetal condition, together with the likelihood of success of induction of labour after assessment of the cervix²¹. Attempts to prolong pregnancy in order to improve fetal maturity are unlikely to be of value. However, it is unsafe to deliver the baby of an unstable mother even if there is fetal distress. Once seizures are controlled, severe hypertension treated and hypoxia corrected, delivery can be expedited. Vaginal delivery should be considered but caesarean section is likely to be required in primigravidae well before term and with an unfavorable cervix. Continuous monitoring of the fetal heart and uterine contractions should be carried out. As long as the woman's condition remains stable there is no need for routine instrumental delivery¹⁷. The special midwifery care and observations previously described are continued symptoms such as severe head ache, vomiting and epigastric pain should alert the midwife to seek help from a senior obstetrician.

Pregnancy induced hypertension has conformed to increase the risk of low birth weight significantly by both increasing preterm birth weight as well as reducing fetal growth. As the hypertensive disorders are unlikely to be prevented, early detection and referral by the midwife is

crucial so that monitoring (blood pressure, urine) and treatment can be implemented to minimize the severity of the condition⁶. Women who do not receive antenatal care are more likely to die from complications related to the hypertensive disorders of pregnancy. The midwife is in a unique position to identify those women who are more likely to develop pre eclampsia. A comprehensive history taking at woman's first meeting will identify the following risk factors⁸, nulliparity, previous history of preeclampsia, the presence of underlying medical disorders for example pre existing hypertension, renal disease, diabetes, and autoimmune disease such as lupus. The midwife's responsibility is regular antenatal screening involves blood pressure reading, testing urine at each visit for protein and assessing for significant non dependent edema. Sometimes mild preeclampsia progresses to severe preeclampsia and eclampsia very suddenly with little or no warning. If a woman develops any of the symptoms and signs of severe preeclampsia, urgent treatment is required to try and prevent the onset of eclampsia. In severe preeclampsia, delivery should take place within 24 hours of the onset of the symptoms. In cases of eclampsia delivery should occur within 12 hours of the onset of convulsion. Making sure the airways are clear and the woman can breathe. Fits are controlled by giving the woman anticonvulsant drugs (magnesium sulphate). If magnesium sulphate is not available, diazepam may be given. Antihypertensive drugs should be given if the diastolic blood pressure is 110 mmHg or more. Hydralazine is the drug of choice. Any stimulus may precipitate fit, so external stimuli such as noise, bright lights and handling the woman are reduced to a minimum. Care after delivery is important therefore the woman must be very carefully observed and management should be continued at least 48 hours after delivery¹⁸.

Women with severe hypertension during pregnancy should receive treatment with antihypertensive drugs. Magnesium sulfate is recommended for the prevention of eclampsia in women with severe pre-eclampsia in preference to other anticonvulsants. Magnesium sulphate supplementation has been shown to be effective for prevention of eclampsia in preeclamptic women¹⁷. Induction of labour is recommended for women with severe preeclampsia at a gestational age when the fetus is not viable or unlikely to achieve viability within one or two weeks. In women with severe pre-eclampsia at term, early delivery is recommended. In women treated with antihypertensive drugs antenatally, continued antihypertensive treatment postpartum is recommended. Treatment with antihypertensive drugs is recommended for severe postpartum hypertension. As the hypertensive disorders are unlikely to be prevented, early detection and referral by the midwife is crucial so that monitoring and treatment can be implemented to minimize the severity of the condition. Education about the warning



symptoms is also important because early recognition may help women receive treatment and prevent worsening of the disease.

Conclusion

Pregnancy induced hypertension complicates a significant number of pregnancies, causing a number of potential problems. It is important to emphasize the early and regular antenatal check up for all the pregnant women. Midwives play a key role in detection and the care of women who experience hypertensive disorders during pregnancy. Education about the warning symptoms is also important because early recognition may help women receive treatment and prevent worsening of the disease. Follow up investigation may be necessary to safeguard women's physical and psychological well being. Antihypertensive drug may be prescribed if the diastolic blood pressure exceeds 100 mmHg. Magnesium sulfate is recommended for the prevention of eclampsia in women with severe preeclampsia. Close medical supervision and timely delivery are the keys to the treatment of severe preeclampsia and eclampsia. The mode of delivery should be determined after considering the presentation of the fetus and the fetal condition, together with the likelihood of success of induction of labour after assessment of the cervix. If there are signs of severe fetal growth restriction or fetal compromise, admission of the women to the hospital for assessment and possible expedited delivery should be done.

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