Hypertensive Disorders in Pregnancy

Approved – May 2009 **For Review – May 2011**

Preamble

Guidelines outline recommendations, informed by both the best available evidence and by midwifery philosophy, to guide midwives in specific practice situations and to support their process of informed decision-making with clients. The midwifery philosophy recognizes the client as the primary decision maker in all aspects of her care and respects the autonomy of the client.[1]

The best evidence is helpful in assisting thoughtful management decisions and may be balanced by experiential knowledge and clinical judgment. It is not intended to demand unquestioning adherence to it's doctrine as even the best evidence may be vulnerable to critique and interpretation.

The purpose of practice guidelines is to enhance clinical assessment and decision-making in a way that supports practitioners to offer a high standard of care. This is supported within a model of well-informed, shared decision-making with clients in order to achieve optimal clinical outcomes.

Introduction

Hypertension in pregnancy is the leading cause of maternal and perinatal morbidity in both Canada and North America.[2,3] Maternity care providers must utilize a cohesive set of guidelines for defining, diagnosing and managing women with suspected hypertensive disorder in order to better manage blood pressure as well as to prevent the onset of organ failure. Nonetheless, up to 40% of women who develop eclampsia in pregnancy will not have had both hypertension and proteinuria in the week preceding the seizure.[2] It is therefore of utmost importance that midwives remain vigilant for signs of pre-eclampsia and hypertensive disorders of pregnancy in all women, and particularly in those who present with either proteinuria or hypertension, or solely with adverse effects.

This guideline draws heavily upon the BCRCP Obstetric Guideline "Hypertension in Pregnancy" which outlines guidelines for management in BC.

Definition

The Canadian Hypertension Society currently defines hypertensive disorders of pregnancy in the following categories:

Classification	Definition
A. Pre-existing Hypertension	Diastolic hypertension that predates pregnancy or is diagnosed before 20 weeks gestation. Typically persists beyond 42 days postpartum.
1. Essential	Primary
2. Secondary	Secondary to disorders such as renal disease, Cushing syndrome, or sympathetic nervous system disease.
B. Gestational Hypertension	Diastolic pressure >90 mm of Hg on 2 occasions 4 hours apart diagnosed at greater than 20 weeks gestation. Typically resolves before 42 days postpartum.
1. Without Proteinuria	Protein excretion is < 0.3 g/day in 24 hr urine collection
a. without adverse conditions	

b. with adverse conditions	

CNS	visual disturbances, frontal headache, hyperreflexia, convulsions
Cardio/ Vascular / Pulmonary	diastolic pressure >110 mmHg, pulmonary edema, shortness of breath, chest pain
Renal	proteinuria ≥0.3g/day, oliguria (<500 ml/day, hypoalbuminemia (albumin <18 g/L)
Hematological	thrombocytopenia (platelet count <100,000 x 10^9/L), hemolysis
Hepatic	elevated liver enzymes, persistent right upper quadrant abdominal pain/chest pain, severe nausea and vomiting
Fetal	placental abruption, intrauterine growth restriction, oligohydramnios, absent or reversed umbilical artery end diastolic flow

2. With Proteinuria	24-hr urine collection: ≥0.3 g/day (Spot protein: creatine ratio: >30 mg/mmol)
a. without adverse conditions	
b. with adverse conditions	As above, especially with hypoalbuminanemia
C. Pre-existing hypertension with superimposed gestational hypertension with proteinuria	Preexisting hypertension associated with increasing hypertension and protein excretion of ≥0.3g/d at >20 weeks gestation.
D. Unclassifiable	Hypertension if BP not recorded prior to 20 weeks, with or without systemic manifestations. Reassessment and classification should be made at ≥42 days postpartum.

Complications associated with hypertensive disorders in pregnancy

- Maternal Complications: pulmonary edema, placental abruption, acute renal failure, seizures, HELLP (hemolysis, elevated liver enzymes, lowered platelets), multi-organ failure
- Neonatal: IUGR, low birth weight, prematurity, admission to NICU, low 5 minute APGAR scores, low umbilical artery pH, greater need for IPPV, oligohydramnios, placental insufficiency,

Prediction of Preeclampsia

The rate of hypertensive disorders of pregnancy in British Columbia in 2003-2004 was 5.7%.[2]

Risk factors of greatest significance:

- previous preeclampsia[3,4]
- anti-phospholipid antibodies[3]
- medical conditions such as pre-existing hypertension, diabetes mellitus, renal disease, collagen vascular disease[2,3]
- multiple pregnancy[2,3]

Additional risk factors:

- family history of preeclampsia (mother or sister)[2,3] or early-onset cardiovascular disease[3]
- booking sBP ≥130mmHg or d BP ≥80mmHg[3]
- maternal age <20 years or >40 years[2,3]
- interpregnancy interval >10 years or <2 years[3]
- primigravida/ first pregnancy with a new partner[2,3]

- lack of midtrimester fall in BP[2]
- obesity (BMI ≥35) [3]
- excessive weight gain (> 2lbs/week) [2,3]
- finger and facial edema[2]
- ethnicity (Nordic, Black, South Asian, Pacific Island) [3]
- Low socioeconomic status[3]
- Low dietary intake of calcium (<600mg/day); supplement with at least 1000mg/day is recommended[3]

The College of Midwives of BC stipulates that a history of essential or pregnancy-induced hypertension is an indication for discussion with another midwife or physician, and a history of eclampsia is an indication for consultation.[4] The SOGC recommends that all women with markers of increased risk for pre-eclampsia should be offered obstetrical consultation in pregnancy.[3]

Measurement of Blood Pressure

- Sitting position with arm at heart level using left or right arm, though if the BP is consistently higher in one arm, the higher arm should be used[3]
- Relaxed quiet environment, after 10 minutes of rest
- Appropriate size cuff (circumference of arm should be 2/3 the length of the cuff)
- Calibrated sphygmomanometer (Aneroid manometers should be regularly calibrated against a mercury column manometer)
- Inflate to 200 mmHg or 40 mmHg above estimated systolic blood pressure over 3-5 seconds and deflate the cuff smoothly at a rate of 2-3 mmHg per second
- Record Korotkoff sounds I and V and estimate the BP to the nearest 2 mmHg

Measurement of Proteinuria

Proteinuria is a poor prognostic sign associated with a two-fold increase in perinatal mortality.[5] Ten percent of women will present with only proteinuria in the week before an eclamptic seizure.[3] The SOGC currently recommends that all women should be assessed for proteinuria in pregnancy.[3]

The three primary ways to screen for proteinuria are urinary dipstick, spot protein: creatinine ratio (P: Cr), and 24-hr urine collection. The 24-hr urine is considered the gold standard for quantification of protein loss, however it is time-consuming, onerous for the patient and often incomplete. The spot P:Cr compares favourably with the 24-hr urine collection as a reasonable test to rule out proteinuria, though cannot quantify proteinuria, and it has the advantage of being timely and convenient.[6] Midwives are not currently able to order the spot P:Cr.[5]

The inadequacies of urinary dipstick testing are well-established[6,7] and it is known that 12% of negative or trace readings are false negatives when compared with the 24-hr urine.[3] It is possible that accuracy may be improved at higher thresholds, such as ≥+1 however current available data is inadequate.[6]

Urinary dipstick testing is appropriate for routine screening when the suspicion for preeclampsia is low. Definitive testing via either the P:Cr or 24-hr urine collection is indicated if there is a suspicion of preeclampsia in hypertensive women or normotensive women with symptoms suggestive of preeclampsia.[3,7] Proteinuria should be strongly suspected when urinary dipstick protein is ≥+2.[3] If more than a trace of protein is found on two separate occasions, a 24-hr urine is indicated to quantify protein loss.[5]

Assessment

Blood Pressure	▸ Based on the average of at least 2 measurements ▸ Perinatal morbidity increased at dBP ≥90mmHg[3] ▸ Risk of stroke increased at ≥160mmHg[3] ▸ Relative rise not part of definition of hypertension
Central Nervous	▸ Frontal or occipital headaches

System	▸ Visual disturbances ▸ Hyperreflexia ▸ Irritability ▸ Seizures
Hematologic	▸ Petichiae ▸ Unusual bleeding ▸ Platelets ▸ PTT, PT, Fibrinogen, FDP[i]
Hepatic	▸ Right upper quadrant pain/chest pain ▸ Nausea and vomiting ▸ Flu-like signs ▸ Liver function (ALT, AST, LDH)[ii] ▸ Glucose & ammonia to rule out Acute Fatty Liver of Pregnancy[i]
Renal	▸ Proteinuria >0.3g/24 hours, P: Cr 30 mg/mmol ▸ Oliguria <500ml/24 hours ▸ Dark urine ▸ Uric acid, creatinine, BUN
Pulmonary	▸ Chest pain, shortness of breath
Fetal	▸ Fetal movement ▸ Abruption ▸ NST ▸ Ultrasound for AFI, Doppler flow, BPP, growth

Midwifery management

If the blood pressure is sBP ≥140mmHg and dBP ≥90mmHg:

- Confirm with repeat measurement[iii]
- Assess for adverse conditions
- Order laboratory tests to assess renal, liver and coagulation function[2,3]
    - Laboratory tests ordered by midwife:
        - CBC, including platelets
        - Liver function (ALT, AST, LDH)
        - Uric acid, creatinine, BUN
        - Random glucose
        - Bilrubin
        - Random glucose
        - Serum electrolytes
        - 24-hr urine collection
    - Laboratory tests ordered by physician:
        - INR, APTT, Fibrinogen
        - spot protein: creatinine ratio
        - Albumin
- Assess fetus. Perform NST and consider U/S.
- Prepare client for likely course of care, such as consultation or transfer of care, hospitalization (generally if sBP ≥140mmHg and dBP ≥90mmHg), medication (generally if sBP ≥160mmHg or dBP ≥110mmHg), and, if relevant, the liklihood of preterm birth or hospital birth.
- Consult with a physician in the presence of diastolic ≥90 mmHg, abnormal laboratory values, worsening fetal condition or other clinical signs and symptoms.[4]
- Transfer care to a physician in the presence of proteinuria, adverse conditions or diastolic ≥110mmHg.[4]

[i] The midwife cannot order these tests, however they will be included in a physician's differential diagnosis.
[ii] Abnormal test results require consult with physician.
[iii] 30-70% of women with office BP of ≥140/90mmHg will have normal BP on subsequent measurements at the same visit, in hospital or with home BP monitoring.[3]

The development of a pregnancy-associated complication is typically very stressful for clients, and may be especially difficult when the condition requires a new caregiver or change in place of birth. Clients will likely require counseling about the pathophysiology of gestational hypertension, medical management strategies, and implications for birth and postpartum. Clients will turn to their midwives for this type of information as well as emotional support and continuity of care.

Clients may inquire about alternative or natural remedies to manage hypertension. Although there is no evidence to support the efficacy of natural remedies, clients may elect to consult alternative care providers for complementary therapies such as acupuncture or herbal treatments.

Midwifery Role After Transfer of Care

The midwife is responsible for clearly documenting the transfer of care in the client record. The midwife will remain involved with the patient in a supportive role. After the birth, the midwife may resume primary care of the woman, infant, or both, when appropriate.

Postpartum Management

Monitoring blood pressure and maternal condition should be continued postpartum as up to a quarter of all seizures occur postnatally, as well as to rule out the possibility of essential hypertension. Postpartum blood pressure peaks on days three to six after delivery.[3] Midwives should recall that NSAIDs are contraindicated postnatally if blood pressure has been difficult to control, or in the presence of oliguria, platelets <50 x 10^9/L, or elevated creatinine.[3]

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FURTHER RESOURCES

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