

Headline: Managing hypertensive pregnancies

Authors: Katherine L Tucker, PhD research fellow, Nuffield Department of Primary Care Health Sciences, University of Oxford

Carole Crawford, BSc research midwife, Nuffield Department of Primary Care Health Sciences, University of Oxford

Lucy C Chappell, PhD MRCOG NIHR research professor in obstetrics, Women's Health Academic Centre, King's College London

Richard J McManus, PhD FRCGP general practitioner and NIHR research professor, Nuffield Department of Primary Care Health Sciences, University of Oxford

Standfirst: Key learning points:

- Effective referral upon identification of raised BP is essential for reducing adverse pregnancy outcomes
- Few automated monitors are currently validated for use in pregnancy and pre-eclampsia
- Postpartum psychosocial support and counselling about subsequent cardiovascular risk is important following hypertensive pregnancy

IMAGE IDEA:

Please choose an image similar to the one below



Worldwide, 10% of women have high blood pressure during pregnancy, defined as over 140/90mmHg.¹ Hypertensive disorders during pregnancy may result in substantial maternal morbidity and are a leading cause of direct maternal deaths in the UK. They also carry a risk for the baby, resulting in 8–10% of all preterm births.² Women with severe pre-eclampsia are likely to give birth preterm³ and pre-eclampsia is strongly associated with fetal growth restriction, low birth weight, preterm delivery, respiratory distress syndrome, and admission to neonatal intensive care.⁴ Finally the long-term outcomes for women with a diagnosis of hypertension in pregnancy include an increased likelihood of chronic hypertension and increased lifetime cardiovascular risk.⁵ Hypertension in pregnancy is defined in box 1.

This article aims to provide an up to date guide about best practice in managing women with hypertension in pregnancy for community midwives along with the latest research in the field. Risk factors for, and the management of hypertension in pregnancy, together with its effects on outcome and how a woman's experience can be affected is cover in the article.

Risk factors for hypertension during pregnancy

Current National Institute for Health and Care Excellence (NICE) guidelines recommend blood pressure monitoring at routine antenatal visits with "increased frequency" in those at higher risk.⁶ NICE states that women with any of the risk factors below are considered to be at higher risk:⁶

1. Aged 40 years or older.
2. Nulliparity (first pregnancy).
3. Pregnancy interval of more than 10 years.
4. Family history of pre-eclampsia.
5. Previous history of pre-eclampsia.
6. Body mass index of 30 kg/m² or above at booking (First antenatal appointment).
7. Pre-existing vascular disease such as hypertension.
8. Pre-existing renal disease.
9. Multi-fetal pregnancy.

Risk factors on the rise

The pregnant population is changing, with an increase in obesity and age of conception meaning that the number of women that fall into the high or higher risk groups is increasing with a consequent rise in the number of pregnancies at risk of hypertensive complications. Over the last ten years the number of women with a BMI more than 30 has increased from 16% to 24%⁷ and the Centre for Maternal and Child Enquiries (CMACE) 2009 audit revealed that 5% of the pregnant population had a BMI more than 35 at any time during pregnancy, almost half of whom had a BMI more than 40 (morbid obesity). Weight gain is well known to be associated with rising BP and is a major driver of hypertension.⁸ Furthermore, women are becoming pregnant at older ages: the conception rate for women aged 35 to 39 has almost doubled since 1990 and blood pressure rises with age.

Box 1. Defining hypertension during pregnancy

The nomenclature used in this area can be confusing and so we have presented definitions here:

Chronic hypertension is the documented presence of chronic (non-gestational) hypertension prior to pregnancy, or the new onset/detection of hypertension prior to 20+ weeks in the absence of proteinuria. Around a quarter (26%) of women with chronic hypertension will develop superimposed pre-eclampsia, and 28% will need preterm delivery.⁹

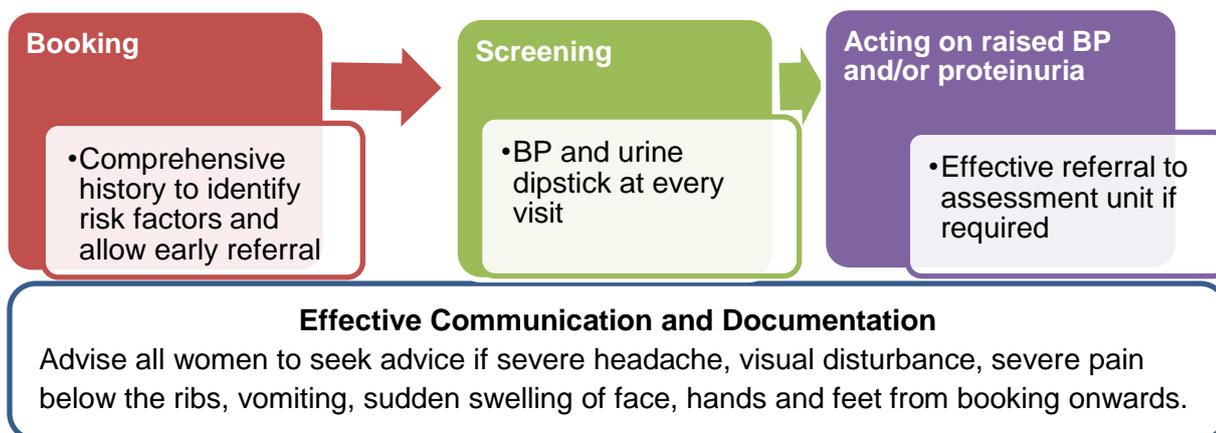
Gestational hypertension is defined as a new hypertension (blood pressure more than 140/90mmHg on two separate occasions at least four hours apart) presenting after 20 weeks' gestation. A little less than half of women with gestational will go onto develop pre-eclampsia, particularly if they develop gestational hypertension before 34 weeks' gestation.

Pre-eclampsia is defined as a new hypertension presenting after 20 weeks of pregnancy with significant proteinuria (urinary protein: creatinine ratio more than 30mg/mmol).¹⁰ Some definitions include other criteria in terms of changes in liver function and platelet blood tests, particularly for severe pre-eclampsia.¹¹

Best practice

The midwife's role in the assessment and diagnosing hypertension is fundamental to the early detection and subsequent referral that will allow treatment to be implemented rapidly, potentially minimising the severity of the condition. The midwife is in a prime position to identify those women who are more likely to develop gestational hypertension, and respond to detection of problems (see Figure 1).

Figure 1. Midwife's role within the multidisciplinary team



Routine monitoring of blood pressure

Use of an accurate blood pressure monitoring device is fundamental to in making a correct diagnosis and thus determining potential referral (see Box 2). Both aneroid and digital sphygmomanometers are commonly used but they require regular calibration checks. An additional issue for digital monitors is that, as a consequence of cardiovascular changes during pregnancy, many that are validated in the general population may not be accurate in pregnancy and pre-eclampsia. There are only a few monitors specifically validated for use in pregnancy and pre-eclampsia. These include; Omron-MIT Elite, Omron M7, Microlife WatchBPHome, and Microlife BP 3AC1-1 (see Resources section).

Box 2: Taking a blood pressure reading

1. The women should be seated on a comfortable chair with her back supported and both feet flat on the floor.
2. Rested for five minutes before measurement is taken.
3. Ensure the arm is relaxed and supported at heart level and ask that she refrain from talking during the measurement.
4. Use an appropriate sized cuff by measuring arm circumference (less than 33 may require a large cuff and more than 41 may require a thigh or extra-large cuff).
5. Measure diastolic as the disappearance of Korotkoff phase V sounds or use validated digital monitor.

How hypertension affects a pregnancy

Hypertensive disorders of pregnancy may impact on the mother and fetus. A woman may develop severe hypertension (systolic blood pressure more than 160mmHg and/or diastolic more than 110mmHg), with risks of a stroke if this is unrecognised and untreated. The Confidential Enquiries into Maternal Death has repeatedly emphasised the need for prompt referral and treatment if a woman's systolic blood pressure is more than 150mmHg, although the absolute risk of stroke is still low. A very small proportion of women may have an eclamptic fit without obvious hypertension or proteinuria preceding it. Women with pre-eclampsia are also at risk of placental abruption and so any reports of abdominal pain, vaginal bleeding or reduced fetal movements should lead to immediate referral to a hospital unit.

Women with hypertensive disorders of pregnancy, particularly chronic hypertension and pre-eclampsia, are at greater risk of having a baby with fetal growth restriction. Growth scans are usually arranged for these women. Delivery may be indicated, even if preterm, for worsening pre-eclampsia or fetal growth restriction, with consequences for the long-term development of the infant.

Women with hypertension and its complications (such as pre-eclampsia) may experience psychological stress and disruption of family life due to the need for extra hospital visits and potentially long stays as an inpatient. Community midwives can provide valuable support during pregnancy and after the birth for women at this time.

Management

Once diagnosed, treatment for hypertension during pregnancy aims to reduce maternal risks and achieve optimal perinatal survival. Blood pressures over 150/100mmHg typically require antihypertensive therapy; nifedipine, labetalol and methyldopa are most commonly used.

Women with chronic hypertension who are taking antihypertensive drugs prior to pregnancy should have their medication checked with their GP as soon as they know they're pregnant. ACE inhibitors (usually ending in 'pril') and angiotensin receptor blockers (usually ending in -tan) are not safe in pregnancy and diuretics (usually ending in 'ide') should also be stopped. Women who are at high risk of pre-eclampsia

should be started on aspirin 75mg once daily to reduce their likelihood of developing the disease.⁶

In addition to antihypertensive therapy, more intensive monitoring is required with regular blood pressure checks, urine dipstick to detect the onset of pre-eclampsia, monitoring of fetal growth with ultrasound, cardiotocography (CTG) (in some cases), together with blood tests for detecting complications. Typically, a rising creatinine, urea and electrolytes (U&E), increasing alanine transaminase (ALT, checked on liver function tests) and falling platelet count (from full blood count) can detect complications and should prompt immediate referral if the woman is not already under hospital surveillance.

Postpartum support following hypertensive pregnancy

The community midwife has a pivotal role to play in this period of transition to motherhood. This is a time of emotional change and can be particularly difficult for women whose babies spend a long periods in a neonatal unit with subsequent separation. Furthermore, new mothers with pregnancy induced hypertension may still require medication which can contribute to further concerns and anxiety. Regular monitoring of blood pressure should continue and liaison with the general practitioner is useful to ensure that the mother is on the right dose of antihypertensive medication.

Resources

British Hypertension Society – bhsoc.org

References

1. Duley L. The global impact of pre-eclampsia and eclampsia. *Seminars in perinatology* 2009;33(3):130-7.
2. Slattery MM, Geary M, Morrison JJ. Obstetric antecedents for preterm delivery. *Journal of perinatal medicine* 2008;36(4):306-9.
3. Rasmussen S, Irgens LM. The effects of smoking and hypertensive disorders on fetal growth. *BMC pregnancy and childbirth* 2006;6:16.
4. Altman D, Carroli G, Duley L, Farrell B, Moodley J, Neilson J, *et al.* Do women with pre-eclampsia, and their babies, benefit from magnesium sulphate? The Magpie Trial: a randomised placebo-controlled trial. *Lancet* 2002;359(9321):1877-90.
5. Health NCCfWsaCs. Hypertension in pregnancy: the management of hypertensive disorders during pregnancy. *Royal College of Obstetricians and Gynaecologists*, 2010.
6. NICE. *Hypertension in adults: diagnosis and management*. nice.org.uk/guidance/cg127 (accessed 19 February 2016).
7. Lifestyles Statistics Team. Statistics on Obesity, Physical Activity and Diet: England 2015. *Health and Social Care Information Centre*, 2015.
8. Modder J, Fitzsimons KJ on behalf of the Centre for Maternal and Child Enquiries and the Royal College of Obstetricians, Gynaecologists. CMACE/RCOG Joint Guideline: Management of Women with Obesity in Pregnancy Centre for Maternal and Child Enquiries. *Royal College of Obstetricians and Gynaecologists*, 2010.

9. Bramham K, Parnell B, Nelson-Piercy C, Seed PT, Poston L, Chappell LC. Chronic hypertension and pregnancy outcomes: systematic review and meta-analysis. *British Medical Journal* 2014;348:g2301.

10. NICE. *Antenatal care for uncomplicated pregnancies*. nice.org.uk/guidance/cg62 (accessed 19 February 2016).

11. Tranquilli AL, Dekker G, Magee L, Roberts J, Sibai BM, Steyn W, *et al*. The classification, diagnosis and management of the hypertensive disorders of pregnancy: A