Pregnancy Hypertension: An International Journal of Women's Cardiovascular Health 4 (2014) 105–145

Contents lists available at ScienceDirect

Pregnancy Hypertension: An International Journal of Women's Cardiovascular Health

journal homepage: www.elsevier.com/locate/preghy

Review

Diagnosis, evaluation, and management of the hypertensive disorders of pregnancy

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ARTICLE INFO

Article history:
Received 6 January 2014
Accepted 17 January 2014
Available online 25 February 2014

Keywords:
Hypertension
Blood pressure
Pregnancy
Preeclampsia
Maternal outcome
Perinatal outcome
Long-term prognosis

ABSTRACT

Objective: This guideline summarizes the quality of the evidence to date and provides a reasonable approach to the diagnosis, evaluation and treatment of the hypertensive disorders of pregnancy (HDP).

Evidence: The literature reviewed included the previous Society of Obstetricians and Gynaecologists of Canada (SOGC) HDP guidelines from 2008 and their reference lists, and an update from 2006. Medline, Cochrane Database of Systematic Reviews (CDSR), Cochrane Central Registry of Controlled Trials (CCRCT) and Database of Abstracts and Reviews of Effects (DARE) were searched for literature published between January 2006 and March 2012. Articles were restricted to those published in French or English. Recommendations were evaluated using the criteria of the Canadian Task Force on Preventive Health Care and GRADE.

Abbreviations: ABPM, ambulatory blood pressure monitoring; ACE, angiotensin converting enzyme; ACR, albumin to creatinine ratio; ALT, alanine transaminase; aPTT, activated partial thromboplastin time; ARB, angiotensin receptor blocker; AST, aspartate transaminase; BMI, body mass index; Booking, first antenatal visit, usually early in pregnancy; BP, blood pressure; CHEP, Canadian Hypertension Education Program; CHS, Canadian Hypertension Society; CI, confidence interval; CVP, central venous pressure; DASH, Dietary Approaches to Stop Hypertension; FHR, fetal heart rate; HELLP, haemolysis, elevated liver enzymes, low platelets; HBPM, home blood pressure monitoring; hCG, human chorionic gonadotropin; HDP, hypertensive disorders of pregnancy; IM, intramuscular; IUGR, intrauterine growth restriction; IV, intravenous; LDH, lactate dehydrogenase; LMWH, low molecular weight heparin; $MgSO_4$, magnesium sulfate; mmHg, millimeters of mercury; NICE, National Institute for Health and Clinical Excellence; NICU, neonatal intensive care unit; NNT, number needed to treat; NSAID, non-steroidal anti-inflammatory drug; po, per os; RCT, randomized controlled trial; RR, relative risk; SGA, small for gestational age; SOGC, Society of Obstetricians and Gynaecologists of Canada; UTI, urinary tract infection; WHO, World Health Organization.

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http://dx.doi.org/10.1016/j.preghy.2014.01.003

Introduction

The hypertensive disorders of pregnancy (HDP) remain leading causes of maternal and perinatal morbidity and mortality [1,2]. This guideline summarizes the quality of the relevant existing evidence and provides a reasonable approach o the diagnosis, evaluation, and treatment of the HDP.

Our **purpose** is to support evidence-based maternity care of women who: are planning pregnancy and are at risk of a HDP, have a HDP in the current pregnancy, or are postpartum and had a HDP. When necessary, we have provided expert opinion about reasonable clinical care. The information should not be taken to dictate an exclusive course of care, and is amenable to well-documented local amendments. Our **health intent and aim** is, for pregnancies complicated by a HDP, to improve short- and long-term maternal, perinatal, and paediatric outcomes, and related cost-effectiveness of interventions. The **expected benefit** of using this guideline is improved outcomes for mother, baby, and child, through evidence-advised practice. The **target users** are multidisciplinary maternity care providers from primary to tertiary levels of health care.

The **questions** that this guideline seeks to address are:

- How, and in what setting, should blood pressure (BP) be measured in pregnancy and what is an abnormal BP?
- How should proteinuria be measured in pregnancy? What constitutes significant proteinuria? Is heavy proteinuria an indication for delivery?
- How should the HDP be diagnosed and classified? What constitutes severe preeclampsia?
- What is the prognosis of pregnancies complicated by pre-existing hypertension, gestational hypertension, or preeclampsia?
- How can preeclampsia and its complications be predicted and/or prevented by lifestyle changes, medication and/or care of a specific type or in a specific location?
- How should women with a HDP be managed with regard to: initial investigations; dietary and lifestyle change; place of care; antihypertensive therapy; aspects of care specific to women with preeclampsia (such as magnesium sulfate); mode and timing of delivery; intrapartum care (including BP monitoring and analgesia/anaesthesia); and postpartum monitoring, treatment, and counselling regarding the impact of a HDP on both future pregnancy outcomes and long-term maternal and paediatric outcomes?
- What is the perspective of the patient with regard to diagnosis and evaluation?
- How can this guideline be implemented into clinical practice?

Methods

The guideline was developed by a methodologist and maternity care providers (from obstetrics, internal medicine, anaesthesia, and paediatrics) knowledgeable about the HDP and guideline development.

The literature reviewed included the previous (2008) SOGC HDP guideline and its references [3] covering articles until July 2006, as well as updated literature from January 2006 until March 2012, using a search strategy similar to that for the 2008 guideline (and available upon request); a notable addition was exploration of the perspective and interests of patients with a HDP [4]. Literature reviews were conducted by librarians of the College of Physicians and Surgeons of British Columbia and University of British Columbia, restricting articles to those published in English and French.

We prioritized randomized controlled trials (RCTs) and systematic reviews (if available) for therapies and evaluated substantive clinical outcomes for mothers (death; serious morbidity, including eclampsia, HELLP syndrome, and other major end-organ complications; severe hypertension; placental abruption; preterm delivery; Caesarean delivery; maternal adverse effects of drug therapies or other interventions; and long-term health) and babies (perinatal death, stillbirth, and neonatal death; small for gestational age infants; NICU care; serious neonatal morbidity, and long-term paediatric health and neurodevelopment).

All authors graded the quality of the evidence and their recommendations, using the Canadian Task Force on Preventive Health Care (Appendix Table A1) [5] and GRADE (Level of evidence/Strength of recommendation, Appendix Table A2) [6].

This document was reviewed by the Executive and Council of the SOGC, and the approved recommendations published on the SOGC website as an Executive Summary (www.sogc.com).

Chapter 1: Diagnosis and classification of the HDPs

Measurement of BP

Recommendations

1. BP should be measured with the woman in the sitting position with the arm at the level of the heart (II-2A; Low/Strong).
2. An appropriately sized cuff (i.e., length of 1.5 times the circumference of the arm) should be used (II-2A; Low/Strong).
3. Korotkoff phase V should be used to designate diastolic BP (I-A; Moderate/Strong).
4. If BP is consistently higher in one arm, the arm with the higher values should be used for all BP measurements (III-B; Very low/Weak).
5. BP can be measured using a mercury sphygmomanometer, calibrated aneroid device, or an automated BP machine that has been validated for use in preeclampsia (II-2A; Low/Strong).
6. Automated BP machines that have not been validated for use in preeclampsia may under- or over-estimate BP in those women and comparison of readings using mercury sphygmomanometry or a calibrated aneroid device is recommended (II-2A; Low/Strong).
7. In the office setting, when BP elevation is non-severe and preeclampsia is not suspected, either ambulatory BP monitoring (ABPM) or home BP monitoring (HBPM) is useful to confirm persistently elevated BP (II-2C; Very low/Weak).