SOCIETY STATEMENT

A Brief Review of the 2009 JSSH Guidelines for the care and treatment of Pregnancy induced Hypertension

Key words:

guidelines, pregnancy induced hypertension, preeclampsia, management

Katsuhiko Naruse¹, Yoshikatsu Suzuki², Osamu Nakamoto³, Shintaro Makino⁴, Hirohito Metoki⁵, Kazuya Mimura⁶, Hidehiko Miyake⁷, Mamoru Morikawa⁸, Takahiko Murayama⁹, Tomoyoshi Nohira¹⁰, Yasumasa Ohno¹¹, Motoi Sugimura¹², Hidenori Takahashi¹³, Kanji Tanaka¹⁴, Kazushi Watanabe¹⁵

Department of Obstetrics & Gynecology, ¹Nara Medical University, ²Nagoya City West Medical Center, ³Osaka City General Hospital, ⁴Juntendo University, ⁵Tohoku University, ⁶Osaka University, ⁷Japanese Red Cross Katsushika Maternity Hospital, ⁸Hokkaido University, ⁹Saitama Medical University, ¹⁰Tokyo Medical University Hachioji Medical Center, ¹¹Ohno Ladies' Clinic, ¹²Hamamatsu Medical University, ¹³Nagoya University, ¹⁴Hirosaki University, ¹⁵Aichi Medical University

We present a brief review of pregnancy induced hypertension (PIH) guidelines provided by the Japan Society for Study of Hypertension in Pregnancy (JSSH) in 2009. This review aims to compare the Japanese standards of diagnosis, treatment, and management of hypertensive disorders in pregnancy with those of other countries, as well as to present a resource for Japanese clinical studies or case reports published internationally.

Foreword

This article is a brief review of pregnancy induced hypertension (PIH) guidelines provided by the Japan Society for Study of Hypertension in Pregnancy (JSSH) in 2009.¹⁾ The Japanese criteria are stated in the original guidelines in Outline of Definition and Classification of "Pregnancy induced Hypertension (PIH)".²⁾ Any errors in translation are the responsibility of the author, and not the JSSH. As such, if any discrepancies exist between the original Japanese guidelines and this article, please defer to the original Japanese guidelines, as they represent the accurate version. The original guidelines are currently being reviewed such that an updated version will be published in 2014.

We present this brief review in order to compare Japanese standards of diagnosis, treatment, and management of hypertensive disorders in pregnancy with those of other countries, and with standards set by

the International Society for the Study of Hypertension in Pregnancy (ISSHP). We also anticipate that it will serve as a valuable research tool, as Japanese clinical studies and case reports are conducted and published internationally.

SECTION I: Epidemiology and risk factors of PIH [Original: Section V]

CQ 1: What are the maternal antepartum risk factors for PIH?

1. Maternal age over 40.
2. Complications of hypertension, renal disease, diabetes mellitus, and obesity.
3. Presence of antiphospholipid antibodies.
4. Family history of PIH, hypertension (most important), and diabetes mellitus type 2.

CQ 2: What are the maternal risk factors for PIH arising during pregnancy?

1. Nulliparity.
2. Past history of PIH.
3. More than 5 years since the last gestation.
4. Multiple pregnancies.
5. Maternal blood pressure of ≥ 130 mmHg and ≥ 80 mmHg for systolic and diastolic pressures, respectively, or a mean arterial pressure of ≥ 90 mmHg in the first trimester of pregnancy.
6. Urinary tract infection.
7. Periodontal disease.

SECTION II: Prediction and prevention of PIH [Original: Section VI]

CQ 3: Are there any tests that can predict the onset of PIH?

1. There is currently no reliable test that can predict PIH.

CQ 4: Can any interventions prevent PIH?

1. There are currently no interventions that can reliably prevent PIH.

SECTION III: Diagnosis and care of PIH [Original: Section VII]

CQ 5: When is the critical time for early detection of PIH in a routine antenatal visit?

Reviewer's comment: Routine antenatal visits in Japan typically occur every 2 weeks before 12 weeks gestational age (GA), every 4 weeks between 12 and 28 weeks GA, every 2 weeks between 28 and 36 weeks GA, and every week after 36 weeks GA (the Japan Society of Obstetrics and Gynecology [JSOG] guidelines 2011).³⁾ Certified obstetricians supervise every visit and ultrasounds are performed at each visit.

1. Spatiotemporal assessment in physical examinations, hematological/biochemical data, and ultrasound findings are important for early detection of PIH.
2. Recommended regular assessments include blood pressure, urine protein levels, and urine glucose in a physical examination; and hematocrit, platelet count, and levels of serum creatinine, uric acid, and liver enzymes (aspartate transaminase, alanine transaminase, lactate dehydrogenase) in laboratory tests.
3. Ultrasound examination should assess fetal growth, amniotic fluid volume, and uterine/umbilical artery Doppler flow. Uterine artery Doppler flow between 18 and 22 weeks GA can predict onset of preeclampsia later on in pregnancy.

CQ 6: How should fetal well-being be assessed in patients with PIH?

1. In cases of fetal growth restriction, a cardiotocogram (CTG) should be initiated during the second trimester of pregnancy (e.g., 26–28 weeks GA).
2. CTG and a biophysical profile score assessment⁴⁾ should be performed twice a week. These should be performed every day for patients with severe preeclampsia* before 32 weeks GA.

*: Defined as PIH ≥ 160 mmHg for systolic blood pressure or ≥ 110 mmHg for diastolic blood pressure, and proteinuria over 2 g/day.^{1,2)}

CQ 7: How should fetal well-being be assessed by ultrasonography in patients with PIH?

1. Fetal growth should be assessed starting at 18 or 20 weeks GA in hypertensive pregnancies.
2. In patients with PIH, fetal growth should be monitored every 2 weeks.
3. Umbilical artery Doppler flow is recommended for cases in which fetal growth restriction occurs.
4. Growth arrest of biparietal diameter and head circumference for 2 weeks necessitates discussion regarding termination of the pregnancy.

CQ 8: How should a convulsion attack in pregnancy be assessed and treated?

1. Common causes for convulsion attacks in pregnancy include cerebrovascular diseases, including eclampsia (hypertensive encephalopathy), intracranial hemorrhage, and cerebral thrombosis.
2. When convulsion attacks occur in pregnancy, treatment for eclampsia should be started immediately as an *ex juvantibus* diagnosis.
3. During an eclamptic episode, anti-hypertensive drugs and magnesium sulfate should be administered and the pregnancy should be terminated.

CQ 9: Are dietary restrictions recommended to prevent or treat PIH?

1. Dietary restrictions in severe PIH* are not recommended. Termination of pregnancy or administration of anti-hypertensive medications is preferred.
2. If the pregnancy must be continued, total caloric intake restriction and mild salt intake reduction are recommended.
3. Overweight patients (body mass index [BMI] > 25) have a higher risk for developing PIH.
4. Restriction of salt intake to < 10 g/day is recommended to prevent PIH. However, there is no evidence to support dietary restrictions, supplement use, or plasma volume expansion as a means to prevent PIH.

*: Defined as PIH with blood pressure ≥ 160 mmHg for systolic or ≥ 110 mmHg for diastolic.^{1,2)}

CQ 10: Are anti-hypertensive medications recommended for patients with PIH?

1. Anti-hypertensive medications for mild PIH* are not recommended.
2. Anti-hypertensive medications for severe PIH are recommended to prevent maternal stroke and allow continuation of the pregnancy, especially in early onset-type PIH.

*: Defined as PIH with blood pressure ≥ 140 mmHg but < 160 mmHg for systolic or ≥ 90 mmHg but < 110 mmHg for diastolic.^{1,2)}

CQ 11: Which medications should be prescribed for patients with PIH?

1. The first choice of anti-hypertensive agents is oral hydralazine and/or methyldopa.
2. The second choice of anti-hypertensive agent is continuous intravenous administration of hydralazine or continuous intravenous nicardipine.
3. In an acute hypertensive attack requiring immediate control of blood pressure, the second choice medications should be administered.
4. Angiotensin-converting-enzyme (ACE) inhibitors and angiotensin II receptor antagonists (ARBs) should not be taken during pregnancy.

Reviewer's comment: The Japanese Ministry of Health, Labour and Welfare revised some of the pharmacologic information for anti-hypertensive agents with regard to their use in pregnancy after the guidelines were published. Recommendations will be revised accordingly in the upcoming 2014 guidelines.

CQ 12: What blood pressure values should patients with PIH therapeutically target?

1. A diastolic blood pressure of 90 to 100 mmHg and a systolic blood pressure of less than 155 or 160 mmHg should be target blood pressure values.
2. Mean arterial pressure should be reduced at a rate no higher than 15 to 20%.

CQ 13: Who should be administered magnesium sulfate?

1. All pregnant or postpartum patients who have experienced eclamptic seizures.
2. Pregnant patients with high risk of eclampsia.
3. Hypertensive patients in active labor.
4. Hypertensive patients, 24 hours after delivery.

CQ 14: What care is recommended for a patient continuing a pregnancy complicated by PIH?**[I] Patients with severe PIH**

1. All patients with severe PIH must be hospitalized.
2. Continuing the pregnancy under strict observation (see below) until 34 weeks GA may be feasible if

blood pressure is adequately controlled (see above). However, the pregnancy must be terminated if PIH symptoms worsen.

3. Blood pressure measurements should be taken every 4 to 6 hours, and urine volume, urine protein, and symptoms (headache, increased deep tendon reflexes, upper abdominal pain) should be assessed at least twice per week. In addition, blood tests which include a complete blood count (especially platelets) and levels of serum creatinine, uric acid, liver enzymes, and LDH, should also be conducted at least twice per week as routine components of maternal care.
4. To ensure fetal well-being, a daily CTG and weekly ultrasound exam of fetal growth, amniotic fluid volume, biophysical profile, and Doppler flow analysis of umbilical artery or fetal middle cerebral artery are recommended.

[II] Patients with mild PIH

1. Termination of pregnancy before 40 weeks GA is recommended.
2. Follow-up in an outpatient clinic is possible, provided there are no hypertensive symptoms and the blood pressure and fetal heart rate remain stable. Daily self-monitoring of blood pressure and fetal movement counts, combined with maternal check-ups at a clinic once or twice per week, are required.

CQ 15: What is the recommended postpartum care for patients with PIH?

1. All patients who continue to be severely hypertensive should remain in the hospital. Patients with mild hypertension can receive follow-up care at an outpatient clinic. Blood pressure and urine protein levels must be checked 1 to 2 weeks after discharge.
2. All patients with PIH should be monitored until 12 weeks postpartum.
3. All patients with PIH are at an increased risk for hypertension, stroke, metabolic syndrome, and renal disease in the future.

References

1. Japan Society for the Study of Hypertension in Pregnancy. ed. Guideline 2009 for care and treatment of hypertension in pregnancy (PIH). Tokyo: Medical View Co., Ltd., 2009. (In Japanese.)
2. Watanabe K, Naruse K, Tanaka K, Metoki H, Suzuki Y. Statement of the Society: Outline of Definition and Classification of "Pregnancy induced Hypertension (PIH)". *Hypertens Res Pregnancy*. 2013; 1: 3–4.
3. Japan Society of Obstetrics and Gynecology, Japan Association of Obstetricians and Gynecologists. eds. Guideline for Obstetrical Practice in Japan 2011. Japan Society of Obstetrics and Gynecology. 2011; 4–10. (In Japanese.)
4. Manning FA, Morrison I, Lange IR, et al. Fetal biophysical profile scoring: selective use of the nonstress test. *Am J Obstet Gynecol*. 1987; 156: 709–712.