In this report, we present the terminology, definition and classification of Hypertensive Disorders of Pregnancy (HDP) by the Japan Society for the Study of Hypertension in Pregnancy (JSSHP).

Terminology

In 2017, “Pregnancy induced Hypertension was revised to “Hypertensive disorders of Pregnancy (HDP)” in Japan.1,2)

Definition

HDP is defined as hypertension (blood pressure ≥ 140/90 mmHg) in pregnancy.

Classification

Preeclampsia (PE)

PE is gestational hypertension accompanied by one or more of the following new-onset conditions at or after 20 weeks gestation, but all symptoms are normalized by 12 weeks postpartum.

1. Proteinuria

2. Other maternal organ dysfunctions, including:

1) Liver involvement without any underlying diseases (elevated transaminases, e.g. ALT or AST > 40 IU/l with or without severe persistent right upper quadrant or epigastric abdominal pain which cannot be diagnosed as other diseases and is treatment-resistant)

2) Progressive kidney injury (creatinine > 1.0 mg/dl,
The new definition and classification of HDP

other renal diseases are denied)
3) Stroke, neurological complications (including clonus, eclampsia, visual field disturbance, severe headaches except for primary headache, etc.)
4) Haematological complications (thrombocytopenia due to HDP – platelet count below 150,000/μL, DIC, hemolysis)

3. Uteroplacental dysfunction (*1 fetal growth restriction, *2 abnormal umbilical artery Doppler wave form analysis, or *3 stillbirth)

Gestational hypertension (GH)
GH is persistent de novo hypertension that develops at or after 20 weeks gestation in the absence of features of pre-eclampsia; and hypertension that normalizes by 12 weeks postpartum.

Superimposed preeclampsia (SPE)
SPE is diagnosed in the following cases.
1. Hypertension that is diagnosed pre-pregnancy or before 20 weeks of gestation is followed by newly onset proteinuria, liver or renal involvement without any underlying diseases, stroke, neurological complications, or hematological complications at or after 20 weeks of gestation same as written in the preeclampsia.
2. Hypertension and proteinuria are diagnosed pre-pregnancy or before 20 weeks gestation. One or both of the symptoms worsen after 20 weeks gestation.
3. Renal disease, which only involves proteinuria, is diagnosed pre-pregnancy or before 20 weeks gestation. Hypertension develops after 20 weeks gestation.
4. Hypertension is diagnosed pre-pregnancy or before 20 weeks gestation. Uteroplacental dysfunction develops after 20 weeks gestation.

Chronic hypertension (CH)
Hypertension is diagnosed pre-pregnancy or before 20 weeks gestation in the absence of features of superimposed preeclampsia.

Supplement
*1. FGR shall be defined as a case for which the estimated fetal body weight is less than −1.5SD according to the classification of the Japan Society of Ultrasonics in Medicine “Standardization of ultrasonic fetal measurement and Japanese reference values” with neither chromosomal abnormalities nor malformation syndrome.
*2. Abnormal umbilical artery doppler wave form is assumed to be abnormally high umbilical arterial vascular resistance, end-diastolic blood flow disruption, or regurgitation.
*3. This stillbirth has neither chromosomal abnormality nor malformation syndrome.

Subclassification by symptoms

1. Severity
Those falling under either of the following categories are defined as severe. As the term “mild” can be misunderstood as riskless HDP, it is not used in principle.
1) Blood pressure exceeds 160/110 mmHg in GH, PE, SPE, or CH.
2) Maternal organ involvement or uteroplacental dysfunction is recognized in PE or SPE.
* Severe classification by the amount of proteinuria is excluded.

2. Classification by onset
HDP excluding CH that emerges earlier than 34 weeks gestation is defined as early onset (EO) type, and HDP excluding CH that emerges after 34 weeks gestation is defined as late onset (LO) type.

Criteria of hypertension and proteinuria

1. Defined as systolic BP ≥ 140 mmHg and/or diastolic BP ≥ 90 mmHg
Blood pressure measurement method:
1) After resting for 5 minutes or more, check that the cuff wrapped around the upper arm is at the height of the heart, measure the blood pressure twice in a seated position at intervals of 1 to 2 minutes, and calculate the average value.
2) Measure with the left and right upper arm at the time of the first measurement and adopt the higher one if different by 10 mmHg or more.
3) Following device is recommended in measuring blood pressure at office, either mercury sphygmomanometer or properly calibrated automatic sphygmomanometer with the same accuracy as the mercury sphygmomanometer.
2. Diagnosis of proteinuria can be made by any of the following methods.
1) 24 hour urinary protein ≥ 300 mg per day by the Esbach method
2) a spot urine protein/creatinine ratio ≥ 0.3 mg/mg CRE
* Guidelines for obstetrics and gynecology clinical practices in Japan (Obstetrics 2017) is more strict than this, at >0.27 mg/mg CRE.
3. In the event that neither 24 hour urinary protein nor a spot urine P/C ratio measurement can be performed, if urine protein of 1+ or more positive is continuously detected twice or more by dipstick testing, diagnosis
of significant/positive proteinuria can be made.

Appendix

1. Gestational proteinuria
Gestational proteinuria is persistent de novo proteinuria that develops at or after 20 weeks gestation and disappears by 12 weeks postpartum, but is excluded from HDP classification.

2. Diagnosis of hypertension
Blood pressure measurements in the physician office/clinic may not reflect the original blood pressure due to white-coat or masked hypertension. In particular, 24 h ambulatory BP monitoring (ABPM) or automated home blood pressure monitoring (HBPM) is needed for those

Table 1. The diagnostic criteria of Sibai 4,5)

| Hemolysis: Serum indirect bilirubin > 1.2 mg/dl, Serum LDH > 600 IU/l, Abnormal peripheral blood smear |
| Liver function: Serum AST (GOT) > 70 IU/l, Serum LDH > 600 IU/l |
| Thrombocytopenia: Platelet count < 100,000/mm² |

Table 2. Diagnostic name and classification of HDP in Japan and other countries

| JSSHP · HRP2013 | ISSHP · A revised statement from the ISSHP2014 | ACOG · Task Force on Hypertension in Pregnancy2013 | SOGC · Working Group. 2014 | SOMANZ · Guideline2014 | NHBPEP · Working Group on High Blood Pressure in Pregnancy 2000 |
|----------------|-----------------------------------------------|-----------------------------------------------|-----------------|---------------------|-----------------------------------------------|
| Pregnancy induced Hypertension (PIH) | Hypertensive disorders of pregnancy | Hypertensive disorders of pregnancy | Hypertensive disorders of pregnancy | Hypertensive disorders of pregnancy |
| Gestational hypertension (GH) | Gestational hypertension | Gestational hypertension | Gestational hypertension | Gestational hypertension |
| Preeclampsia (PE) | Pre-eclampsia–de novo or superimposed on chronic hypertension | Pre-eclampsia–eclampsia | Preeclampsia | Preeclampsia–eclampsia |
| Eclampsia (E) | Chronic hypertension with superimposed preeclampsia | Pre-existing (chronic) hypertension | Preeclampsia superimposed on chronic hypertension | Preeclampsia superimposed upon chronic hypertension |
| Superimposed preeclampsia (S-PE) | Chronic hypertension | Chronic hypertension | Chronic hypertension – essential – secondary – white coat |
| Appendix | Chronic hypertension | Chronic hypertension | Chronic hypertension |
| White coat hypertension | ‘Other hypertensive effects’ | Transient hypertensive effect |
| Postpartum hypertension | White coat hypertensive effect | Masked hypertensive effect |

JSSHP: Japan Society for the Study of Hypertension in Pregnancy
ISSHP: International Society for the Study of Hypertension in Pregnancy
ACOG: American College of Obstetricians and Gynecologists
SOGC: Society of Obstetricians & Gynecologists of Canada
SOMANZ: Society of Obstetric Medicine of Australia and New Zealand
NHBPEP: National High Blood Pressure Education Program
with chronic hypertension for the differential diagnosis of white-coat or masked hypertension, as well as other adventitious hypertensive disorders.

3. HDP related disease
1) Eclampsia
Eclampsia is defined as the onset of convulsions in women with HDP that is not attributed to other diseases including epilepsy and secondary convulsion. Seizures are categorized as antepartum, intrapartum, and puerperal eclampsia, according to the onset time. Eclampsia is thought to be a convulsive seizure due to reversible angiogenic edema in the cerebral cortex; however, edema also occurs in the occipital lobe and brainstem, and may present as various central nervous system manifestations.

2) Central nervous system disorders associated with HDP
Cortical blindness, posterior reversible encephalopathy syndrome (PRES), cerebral hemorrhage associated with hypertension and cerebral vasospasm.

3) HELLP syndrome
It refers to one that is accompanied by haemolysis, elevated liver enzymes, and thrombocytopenia at the same time antepartum, intrapartum, or postpartum, not due to other adventitious complications. HELLP syndrome is not diagnosed by only one or two manifestation described above. The diagnosis of HELLP syndrome should be made in accordance with the diagnostic criteria of Sibai4,5) (Table 1).

4) Pulmonary edema
HDP enhances vascular permeability by vascular
Table 4. Definition of severe HDP in Japan and other countries

| JSSHP | ISSHP | ACOG | SOGC | SOMANZ6) | NHBPEP7) |
|-------|-------|------|------|----------|----------|
| Severe PIH | Severe pre-eclampsia | Severe Features of Pre-eclampsia | Severe complications (that warrant delivery) | Severe pre-eclampsia | Severe preeclampsia |
| BP ≥ 160/110 mmHg or proteinuria ≥ 2.0 g/day, 3+ dipstick | The following criteria are stated to be consensus. | BP ≥ 160/110 mmHg | CNS | Although it is not clearly stated, it is stated that strict management including termination of pregnancy is necessary in the following cases. |
| - Severe hypertension | CNS | Eclampsia | BP ≥ 160/110 mmHg | - Proteinuria of ≥ 2.0 g/day or 2+, 3+ dipstick |
| - HELLP syndrome | CNS | PRES | - Serum creatinine levels is increased (> 1.2 mg/dl unless known to be previously elevated) |
| - Eclampsia | CNS | Cortical blindness or retinal detachment | - Platelet count is < 100,000/μl, there is evidence of microangiopathic hemolytic anemia (with increased LDL concentration), or both |
| - Progressive falling platelet count | CNS | GCS < 13 | - Hepatic enzyme activities (either alanine aminotransferase, aspartate aminotransferase, or both) are elevated. |
| - failure of FGR | CNS | Stroke, TIA, RIND | - Patient reports persistent headache or other cerebral or visual disturbances. |

endothelial dysfunction and frequently causes edema. In severe cases, pulmonary edema also appears.

5) Perinatal cardiomyopathy
Sudden development of heart failure during pregnancy or postpartum in a woman without a past history of cardiac disease. Severe cases can result in maternal death. HDP patients are high risk.

References

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