

(Hypertension Therapy During Pregnancy)

(, RICH IP)

*Barrilleaux PS, Martin JN. Clinical Obstetrics and Gynecology 2002;45:22- 34

가 . 7- 10%
 , Mississippi , ,
 5 1 , ,
 , . ()
) .

140mmHg
 90mmHg . 6
 가 . NIH Working Group
 4가 (1): , - ,
 preeclampsia superimposed on hypertension, .
 12 .

1.

· (Chronic hypertension) :	20	140/90mmHg
6 2 가		
· (Gestational hypertension) :		
12 .		
· (Chronic hypertension) :		
· / (Preeclampsia/Eclampsia) :	20	
(0.3g /24) . ,		
, , , 가 .		
· Preeclampsia superimposed on chronic hypertension :		가
가 ,		

Adapted from the national High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy. Am J Obstet Gynecol 2000;183:S1-S22.

(Chronic hypertension)

90% 가

(10%) , hyperaldosteronism

140/90mmHg , , ,

20 160/110mmHg 가 가 .

2 , superimposed preeclampsia,

가

가 lupus erythematosus, , , /

. Angiotensin-converting enzyme inhibitors

A- receptor antagonists .

150mmHg /

100mmHg .

3. /

Regimen	Primary Therapy	Secondary Drug	Third Drug
Antepartum			
I	Methyldopa	Labetalol	Hydralazine
II	Felodipine	Diuretic	Labetalol
III	Felodipine	Labetalol	Hydralazine
IV	Hydralazine	Labetalol	Diuretic
Postpartum			
I	Hydralazine	Nifedipine XL/felodipine	Labetalol
II	Nifedipine XL/felodipine	Labetalol	Diuretic
III	ACE inhibitor	Calcium channel blocker	Beta-blocker

None of these combinations suggested have been tested by randomized controlled trial.

(Preeclampsia/Eclampsia)

(subplacental vasculature) 20

1-2

, HELLP , DIC,

가 28-32

160/110mmHg

Superimposed preeclampsia

superimposed preeclampsia superimposed

preeclampsia 15-30%

, hyperuricemia

(300mg/24) superimposed preeclampsia 가

(Gestational hypertension)

가 20

(300mg /24)

24-34 748

46% 9.6%

가

3

가 가

sulfate magnesium

80-88%

가 ?

가

Superimposed precleampsia 25%

가

가

가

32 32

가

sulfate가 20 6g 2g

cretinine magnesium 가

가 가 4

hydralazine, labetalol, nifedipine, nitroprusside

110mmHg 159mmHg

hydralazine

Labetalol		20mg
Nifedipine		
(10- 15)	10-20mg capsules	
		4-5
	nitroprusside	sodium
nitroprusside	가	

Drug	Recommendation
Hydralazine	Start with 5–10 mg IV or 10 mg IM. If limited response, repeat at 20-min intervals. Once blood pressure satisfactorily controlled, repeat as needed (usually about 3 hr). Consider another drug if no success with total of 20 mg IV or 30 mg IM.
Labetalol	Start with 20 mg IV bolus; if effect is suboptimal then give 40 mg q 10 min later ×3 and 80 mg every 10 min for two doses, all as needed (20, 40, 40, 40, 80, 80 for a total of 300 mg). Continuous infusion started 0.5–2 mg/min. Use a maximum of 300 mg total for PO or IV. If desired blood pressure levels are not achieved, switch medications. Avoid giving labetalol to women with asthma or congestive heart failure.
Nifedipine	Start with 10 mg orally and repeat in 30 min if necessary. The FDA does not approve short-acting nifedipine for management of hypertension.
Sodium nitroprusside	Administer in hypertension not responding the above medications, clinical findings of hypertensive encephalopathy, or both. Start at a rate of 0.25 mg/kg/min to a maximum dose of 5 mg/kg/min. Fetal cyanide poisoning may occur if used for >4 hr. Consider arterial line.

For a more thorough listing of side effects and dosing, see *Physicians' Desk Reference*, 55th Ed.

Caution: Sudden and severe hypotension can result from administration of any of these agents, especially short-acting oral nifedipine. The goal should be gradual reduction of blood pressure to an acceptable range.

Adapted from the National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy. *Am J Obstet Gynecol* 2000;1983:S14.1

TABLE 4. Treatment of Acute Severe Hypertension in Pregnancy For a more thorough listing of side effects and dosing, see *Physicians' Desk Reference*, 55th Ed. Caution: Sudden and severe hypotension can result from administration of any of these agents, especially short-acting oral nifedipine. The goal should be gradual reduction of blood pressure to an acceptable range. Adapted from the National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy. *Am J Obstet Gynecol* 2000;1983:S14.1

Medication	Usual Nonacute Dosing*	Side Effects	Comments
Methyldopa	250–1,500 mg BID to max 3,000 mg/day	Postural hypotension, drowsiness, fluid retention	Commonly used in hypertension in pregnancy. Mild potency.
Hydralazine	10, 25, 50, 100 mg TID–QID to max 400 mg/day	Headache, palpitations, lupus-like syndrome	Commonly used in short-term control
Labetalol	100, 200, 300 mg to max 2,400 mg/day	Headache, heart block, dry mouth, tremulousness	Avoid in patients with asthma or congestive heart failure and use caution with diabetes.
Nifedipine†	Long-acting: 30–60 mg to start. 30, 60, 90 mg available. Max 120 mg/day	Headache, fatigue, dizziness, peripheral edema, constipation	Greater effect the higher the blood pressure.
Felodipine	5–10 mg/day to max 10 mg BID	Same as nifedipine	Selective effects on vascular smooth muscle
Thiazide diuretic	12.5 mg increasing to 25 mg daily		Electrolyte disturbances may complicate diagnosis of preeclampsia.
Furosemide	20–40 mg/day to 160 mg BID	Same as thiazides	Same as thiazides
Nitroprusside	Not usually used in non-acute hypertension	Hypotension, cyanide poisoning with prolonged use	Used when other methods fail. Consider arterial line with use.

*These dosages may vary from those in the *Physicians' Desk Reference* (PDR), which may be consulted for further information. This information is also not all-inclusive, and the clinician is urged to refer to all package inserts for a more detailed listing.

†The FDA does not approve short-acting nifedipine for management of hypertension.

Central-acting alpha agonists

alpha-methyldopa가 ,
 가 . 1960
 가 , 2 receptors
 . sympathetic tone . ,
 , , , , , .
 Methyldopa 2-3 250-500mg .
 4-6 10-12 . 6
 250-500mg IV , 6 1g IV
 .
 Clonidine sympathetic tone
 2 adrenoceptor agonist . 1 2-3 0.1-0.3mg,
 1 2.5mg .

Vasodilators

Hydralazine hydrochloride hydrazinophthalazine
가 . Hydralazine

가

Beta- adrenergic receptor blockers

beta-blocker

가 가 . , , ,
propranolol labetalol 가
. Propranolol
. Labetalol

hydralazine hydrochloride . Labetalol (1 2
100mg 400mg 가), IV (20mg 10
2mg 300mg) . Labetalol

가 . 2 3
Beta-blockers calcium antagoinsts 가

30, 60, 90mg . 1 60mg
extended-release tablet 30mg(120mg/ 1)
. Felodipine
(5- 10mg/ 1 , 1 2 10mg). Felodipine

Diuretics

Thiazide 2가 . hydrochlorothiazide
sodium chloride
12.5 25mg
hydralazine hydrochloride 가

가 .
 가 , 가 .
 , ,
 . , ,
 .
 furosemide 가
 40- 80mg 4mg/ .

Sodium nitroprusside nitroferrocyanide ,
 . 5µg/kg , 4
 . IV 0.25 - 1.0µg/kg . 1
 1-3 .

Angiotensin - converting (ACE)inhibitors
 2 3 . ,
 , , channel ,

6 6
 가 ()
 .
 160/ 110mg / 가
 magnesium sulfate

HELLP dexamethasone
 dexamethasone

가
 가
 6 가 가
 가 가 .

가 .
30 40-60% .
HELLP Tennessee Mississippi
5-25% .

Supplemental therapy to prevent preeclampsia

가 .
가 .
가 .
가 가
, , zinc,
,
가 .
가 , ,
, ,
가
가
가