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Treatment of Hypertension in Pregnancy and Preeclampsia

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Defining Hypertension

- Normal Blood pressure -120/-80
- Stage I 120-139/ 80-89
- Stage II 140+/ 90+ with intermittent higher blood pressures which are not sustained
- Stage III sustained 140+/90+ with frequent 160/100 range pressures
- From Hypertension Writing group NIH



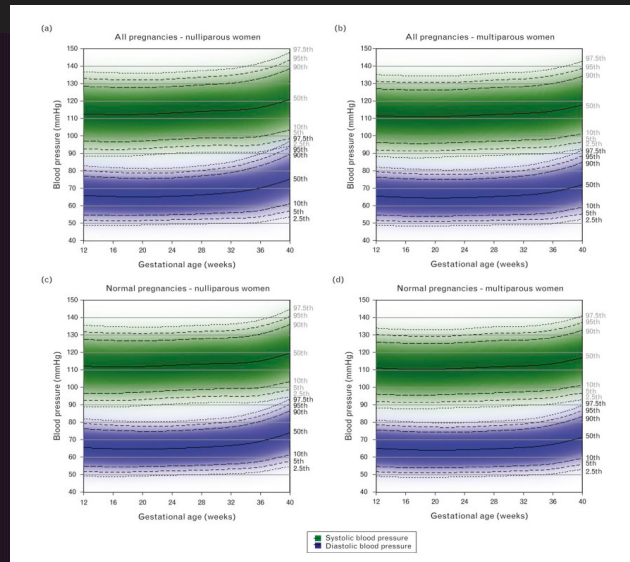
Workup for Hypertension in Pregnancy

- Baseline renal functions
- Labs for autoimmune disorders



When to treat Hypertension

- ACOG Guidelines were changed April 2022
- Treatment recommended for 140/90 or greater
- This change was based on the CHAP study 29,772 patients half treated for 140/ 90 half not until 160/105
- Primary outcomes severe hypertension, delivery before 35 weeks,
- Pih with severe features was 30% versus traditional 38%
- New change is also patients should be maintained on their pre-pregnancy medications for even mild hypertension unless contraindicated (i.e. ACE inhibitor)



How to Treat Hypertension in Pregnancy

- Contraindicated drugs: ACE inhibitors, ARB s
- Why? Fetal lethality or fatal fetal renal disease
- Relative contraindicated drugs: beta blockers,
- initiation of in 3rd trimester loop diuretics



Hypotensive Mechanism of Beta Blockers

- They reduce renal production of angiotensin II by renal Angiotensin converting enzyme and reduce renin production by the juxtaglomerular cells.
- They also reduce maternal and fetal heart rate and contractility.

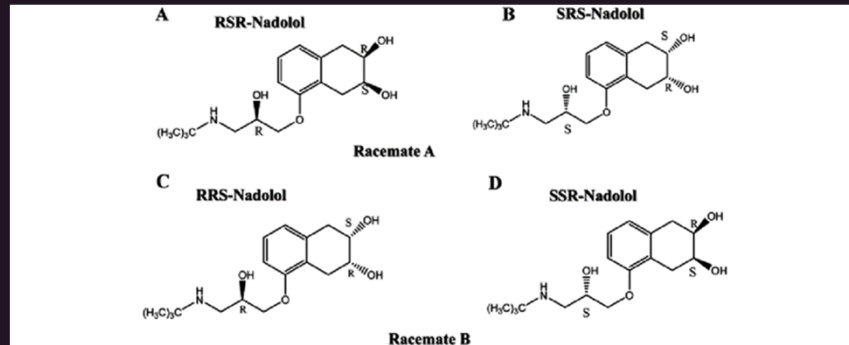


The Four Stereoisomers of Labetalol

- (R,R) mixed non selective beta blocker and selective alpha blocker it is sold separately as carvedilol
- (S,R) is a non-specific alpha blocker
- (S,S) and (R,S) are thought to be non-active but may protect against (R,R) liver toxicity



Stereoisomers of Labetalol



Calcium Channel Blockers

- Nifedipine most widely studied in pregnancy in the U.S.A.
- Very short half lives so have to be given as extended release forms for chronic hypertension.
- No known effects on growth no effect on asthma and diabetes



Diuretics

- Hydrochlorothiazide most common.
- Chlorthalidone actually more effective in reducing blood pressure.
- No known effects on growth no effect on asthma and diabetes.
- Stronger Loop diuretics such as Lasix more effective in acute situations such as labor but affect cardiac output acutely and are less effective long-term in reducing blood pressure and have more side effects of hypovolemia and hypokalemia.
- More effective in patients with Afro-Caribbean genetics.
- All patients need to increase their oral potassium intake, organic sources of K⁺ are more effective and better tolerated.



Alpha2 Agonists

- Methyldopa the longest studied. It is effective but only in very high, 1000 mg bid, doses where it causes somnolence
- Clonidine most effective at both reducing blood pressure and inducing somnolence. Available as a long term patch which lasts a week. Oral has very short half life and withdrawal super hypertension
- No effect on asthma, fetal growth or diabetes



Caveats to Reduce Complications

- Beta blockers are a risk in asthmatics may be considered if asthma is well controlled and mild worrisome if not the beta blockers safest if asthma are celiporolol, metoprolol and atenolol most caused a 7% reduction in FEV1
- ALL beta blockers cause fetal growth restriction
- Alpha 2 agonists and alpha 1 antagonists usually cause somnolence and tiredness
- Loop diuretics are a poor choice as an initial agent for symptomless hypertension and are risky in the presence of fetal growth restriction



Deciding Delivery Timing

ACOG recommendations

First off these are recommendations by people who have not seen or examined your patient . They are not messages from God. They will not come to court to say how good you were to follow their recommendations.



ACOG Recommendations for Delivery Hypertensives

- Chronic HTN controlled not on meds 38 weeks
- Chronic HTN controlled on meds 37 weeks
- Chronic HTN difficult to control 36 weeks
- Gestational HTN well controlled 37 weeks
- Gestational HTN severe range pressure 34 weeks



Follow-up for Treatment of Hypertension

- Wait at least 2 weeks to see if an agent is effective at the dose you have chosen
- Hypertensives are still high risk patients even when there blood pressure has been controlled
- Monthly scans for growth are indicated even when well controlled
- Hypertensives in early stage of disease have INCREASED fetal size probably due to genetics and increased uterine perfusion
- In late disease especially with greatly reduced renal function growth restriction is the norm