Pharmacology of Cardiovascular Drugs in Pregnancy

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• 15,000 Deliveries per year
• 537 Bed:
  – 42 LDR Suites
  – 19 High Risk Labor Rooms
  – 5 Csection Suites
  – 34 High Risk Perinatal Beds
  – 156 Post Partum Beds
  – 7 Newborn Nurseries
• Broad Exposure to use: PPCM, HTN, Maternal and fetal Arrhythmias, HCM, Prolonged QT, HCM, ASHD/MI, PTCA, MARFANS, Loy Dietz, Valvular Heart Disease
Drugs in Pregnancy not The Same

• Metabolism /Pharmokinetics – Different, Often Unknown
• Lot of Show and Tell
• May Affect 2
  – May Use Mom as a Conduit
  – Different Time Periods
    • Different Trimesters
    • Breast Feeding
• Chronic Therapy may not be working
• Targets of Care may be Different
Drugs in Pregnancy
Potential Causes of differences in Pharmokinetics

• GI motility
• Increased Gastric PH
• Increased Volume
• Increased GFR
• Hepatic metabolism
Clopidogrel
Example of Show and Tell

• Esc.- Safety Unknown.
• FDA B- Case reports
• Rats and Rabbits at high dose-good
• Not Clear if Crosses Placenta, Size of Parent Drug theoretically it Should
• Several Case Reports-one with 39 year old with Acute interventional at 6 weeks and later revisit For thrombus- Adenosine, Abciximab had PFO, VSD, MR
• Breast Feeding Unknown
Fetal SVT Affecting 2

• Digoxin – Often first Choice
  – Have to give High Doses
  – Variable Doses
  – Sicker the Baby, Less Effective
Lactation different than Pregnancy

- Ace Inhibitors not for Pregnancy
- Enalapril great drug Post Partum
Bidirectional V Tach and SVT
Worsening of Disease or Change of Metabolism

• Pregnant Patient with History of bidirectional Vtach (Vanderbilt, NHLBI,) Prior on Beta blocker and mexilitene. Seen with palpitations on Metoprolol. Had diminished EF, Holter with Great deal Ectopy– (20% Ventricular)Vtach 63 runs of Vtach Longest 55 beats

• Multiple SVT on lifevest, Worse EF

• Added Flecainide

• EF Resolved, Ectopy markedly improved
<table>
<thead>
<tr>
<th>Guideline</th>
<th>Treatment threshold.</th>
<th>Target</th>
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<tbody>
<tr>
<td>NHBPEP Working Group 2000</td>
<td>150-160 Systolic or 100-110 Diastolic</td>
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<tr>
<td>ACOG 2013</td>
<td>160/105</td>
<td>CHTN 120-160/80-105</td>
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<tr>
<td>ESC 2011</td>
<td>140/90 Higher Risk, Otherwise 150/95</td>
<td></td>
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<tr>
<td>Society of obstetricians and Gynecologists of Canada 2008</td>
<td>160/110</td>
<td></td>
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<tr>
<td>Society of obstetrical Medicine of Australia 2008</td>
<td>170/110 in all 160/100 in Chronic HTN 140-160/90-100</td>
<td>130-155/80-105 130-134/80-89 if comorbidities</td>
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<td>reasonable to consider treatment</td>
<td></td>
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<tr>
<td>NICE 2010</td>
<td>150-159/100-109 (140/90 if End Org. Damage in CHTN)</td>
<td>150/80-100, 140/90 of End Organ</td>
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Different Time Periods, Different patient

• 43 yr old G3 P1 18 weeks Pregnant
• Chronic Hypertension
• PE 4-5x incidence in Chronic HTN
• 18 weeks Pregnant 146/86 on Methyl Dopa 500 Twice a day
• Increased Odds Will get higher
• May need Home BP check to See If needs More frequent Meds Needed
Risk factors For Future Preeclampsia

- Primiparity
- Previous Preeclampsia
- Chronic Hypertension or Chronic Renal Disease
- History of thrombophilia
- Multifetal Pregnancy
- In Vitro Fertilization
- Family history of Preeclampsia
- Type I or Type II Diabetes
- System Lupus Erythema
- AMA (>40 year)
Drugs in Pregnancy

✓ Anticoagulants
✓ Antihypertensives
✓ AntiPlatelet
  ✓ Aspirin
  – ? Clopidogrel
✓ Ace ARB
✓ Beta Blockers
? Diuretics
✓ Antiarrhythmic
Diuretics

- Heart Failure, Hypertension
- ESC – Hydrochlorothiazide and Furosemide “most commonly used”
- If Needed for Heart Failure
- Theoretical Reasons Not to Use for Hypertension
- No to aldosterone antagonists
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