Management of Hypertensive Disorders of Pregnancy: What Is The Evidence, Really?

Nao Nakatsuka PGY3  
January 4, 2010  
Perinatal Rounds
Introduction

- Prevalence of hypertensive disorders of pregnancy (HDP) in pregnant Canadian women:
  - 1% - preexisting HTN
  - 5 - 6% - GHTN
  - 1 - 2% - preeclampsia (2-7% in primips)
  - 0.1-0.2% - HELLP

- Preexisting HTN ↑s risk of preeclampsia by 10-20%

Introduction

- Maternal and perinatal outcomes depend on:
  - GA at disease onset
  - Severity of disease
  - Presence of pre-existing medical disorders
  - Quality of management

- 75% of cases are mild with onset near term or intrapartum → outcome good

Pathophysiology

The cause of preeclampsia

Cytotrophoblast invasion

Altered placentation

Obstruction of spiral arteries

Decrease intertrophoblast invasion

Fetal growth deficiency

Arterial vasoconstriction

Endothelial dysfunction

Systemic hypertension

Kidneys, Proteinuria liver, HELLP brain eclampsia

INFLAMMATORY PROCESS
**Risk Factors for HDP**

**Couple-related:**
- Limited sperm exposure
- Primipaternity
- Male partner who has fathered preeclamptic pregnancy

**Maternal or pregnancy-related:**
- *Previous preeclampsia*
- *Multifetal gestation*
- *Antiphospholipid Abs*
- *Preexisting medical condition(s)*
  - *HTN*
  - *Renal dz / proteinuria*
  - *DM*
- Extremes of maternal age
- Obesity / excessive wt gain in pregnancy
- Interpregnancy interval $\geq 10$ yrs
- Infections in pregnancy
- Thrombophilia
- Family hx of preeclampsia
- Race (Black, South Asian, Pacific Island, Nordic)
- NON-smoking!

Complications of HDP

**Maternal:**
- Placental abruption
- HELLP / DIC
- Pulmonary edema
- Acute renal failure
- Eclampsia
- Liver failure or hemorrhage
- Stroke (rare)
- Death (rare)
- Long-term cardiovascular morbidity

**Fetal/ Neonatal:**
- Preterm delivery and associated complications
- IUGR
- Hypoxia-induced neurologic injury
- Perinatal death
- Long-term cardiovascular morbidity associated with low birth wt (fetal origin of adult dz hypothesis)

Dx of GHTN:
SOGC Guidelines (Mar 2008)

- **dBp ≥ 90 mmHg**
  - Average of at least 2 measurements with same arm – 70% normalize
  - > 90 mmHg → perinatal morbidity ↑
  - dBp better predictor of adverse pregnancy outcomes than sBP

- **sBP ≥ 140 mmHg → follow closely for ↑ dBp**
  - Higher fluctuation → not used for Dx

- Isolated office (white coat) HTN = office DBP ≥ 90 mmHg but home BP < 135/85 mmHg

- Note: Onset of GHTN < 34 wks → 35% develop preeclampsia

MohmSevere GHTN:
SOGC Guidelines (Mar 2008)

- sBP ≥ 160 mmHg or dBP ≥ 110 mmHg

- Tx thought to prevent cerebrovascular and cardiovascular complications

- sBP cut-off based on case series by Martin et al:
  - 28 pts with severe preeclampsia and eclampsia & strokes
  - Hemorrhagic stroke in 25 pts, thrombotic in 2 pts
  - Of 24 pts being treated immediately before stroke:
    - sBP ≥ 160 mmHg in 23 pts and ≥ 155 mmHg in all
    - But, dBP ≥ 110 mmHg in only 3 pts
  - Maternal mortality 53.6%; only 3 pts escaped permanent morbidity

- Eclampsia is not necessarily related to severe HTN
  - UK PRECOG study (BMJ) - 34% of eclamptic women had max dBP ≤ 100 mmHg

Proteinuria:
SOGC Guidelines (Mar 2008)

- Urine dipstick may be used for screening when suspicion of preeclampsia low
  - +1 correlates with ~ 0.3g/24h
  - Strongly suspicious if ≥ 2+

- 24h urine or spot urine Pr:Cr ratio encouraged when ↑ suspicion of preeclampsia (↑BP, s/s of preeclampsia)
  - Proteinuria = 0.3g/ 24h or 30 mg/ mmol in spot

Urine Dipstick and Spot Urine Pr:Cr vs. 24 Hour Urine

- How good is the dipstick at detecting proteinuria (gold std = 0.3g/24h urine)?
  - Waugh et al: analysis of 6 studies evaluating dipstick urinalysis:
    \[ \geq 1 \rightarrow \text{pooled + LR} = 3.48, \text{pooled} - \text{LR} = 0.6 \]

- How good is the spot urine Pr:Cr at detecting proteinuria (gold std = 0.3g/24h urine)?
  - Cut off of 30mg/mmol \[ \rightarrow \text{sens} 85\%, \text{spec} 76\% \]

\[ \rightarrow \text{Although spot urine is accepted as diagnostic test by some countries, Cdn guideline still recommends 24h urine as gold std} \]

Classification of HDP

Preexisting HTN
(pre-pregnancy or < 20 wks GA)

With preeclampsia
(≥ 20wks GA)
- Resistant HTN (requires 3 meds for control of BP)
- New or worsening proteinuria
- Adverse condition(s)

With comorbid conditions
- DM I or II
- Renal disease
- Any other condition for antihypertensive therapy outside pregnancy

Classification of HDP

Gestational HTN
(≥ 20 wks GA)

With preeclampsia
(≥ 20 wks GA)
- New proteinuria
- Adverse condition(s)

With comorbid conditions
- DM I or II
- Renal disease
- Any other condition for antihypertensive therapy outside pregnancy

Severe Preeclampsia

- **Severe preeclampsia:**
  - Onset < 34 wks or
  - Heavy proteinuria (> 3g/d) or
  - Adverse condition(s)

- 10–20% with severe preeclampsia develop HELLP syndrome

- **Note:** Data on correlation between magnitude of proteinuria & maternal/perinatal prognosis not consistent → heavy proteinuria retained in definition of severe preeclampsia until new evidence arises

Adverse Conditions: Maternal Manifestations

- Persistent / new / unusual headache
- Visual disturbance
- Persistent abdominal / RUQ pain
- Severe N/V
- Chest pain, dyspnea
- Jaundice (late sign of DIC)
- Signs of end-organ dysfunction: eclampsia, pulmonary edema, placental abruption
- Severe HTN
- Abnormal labs
  - ↑ Cr [according to local lab criteria]
  - ↑ AST, ALT, LDH [according to local lab criteria]
  - Plt < 100x10^9/L
  - Albumin < 20g/L

Adverse Conditions: Maternal Manifestations

- **NOT part of criteria:**
  - Clonus / hyperreflexia, edema / wt gain: non-specific, common in pregnancy
  - Oliguria: non-specific, many causes (including ↑ ADH after stress or surgery, oxytocin)
    - Do NOT fluid-overload → pulmonary edema is #1 cause of death with preeclampsia
    - Oliguria (< 15 mL/h) should be tolerated, at least over first 6h postpartum, in women who do not have ↑ Cr or pre-existing renal dz
  - Uric acid:
    - Literature on uric acid as predictor of maternal/perinatal complication of preeclampsia conflicting

Adverse Conditions: Fetal Manifestations

- Oligohydramnios
- IUGR (usually asymmetrical, but may be symmetrical if severe placental disease)
- Abnormal Doppler velocimetry of umbilical artery
  - S/D ratio, resistance index, pulsatility index
  - AEDF, REDF
- ↓ resistance to flow in fetal MCA (brain sparing)
- Abnormal ductus venosus waveform
- Stillbirth

Case: Mrs. FM
Mrs. FM

- ID: 33yo G4P1 Filipino female at 28+1 weeks with preexisting HTN (dx’ed at 15 weeks) and IGT
- HPI:
  - Transferred from GNH Nov 26 due to severe HTN and preeclampsia
    - Sept 4 Pr:Cr = 11.39, Nov 18 urate = 380, Nov 22 24h prot <0.2g
    - Nov 18 U/S: EFW 10-50%ile, normal umb artery (UA) doppler but abnormal uterine artery doppler
    - Nov 25 Pr:Cr = 41.79, urate 465, 24h prot 0.7g
      - Occasional HA, no other symptoms
- Ob hx: 2002 – Urgent C/S at 35 weeks for preeclampsia and failed IOL, 4lb9oz
- PMH: healthy
- Meds: Methyldopa 500mg qid, Labetalol 200mg bid
Mrs. FM

- **O/E:**
  - BP labile (108-168 / 80-110)
  - NST normal except minimal variability
  - No abdo tenderness, reflexes normal, no clonus

- **U/S Nov 26:**
  - BPP 8/8, AFI 12.5, EFW 10-50%ile, UA doppler normal

- **Inpt surveillance:**
  - VS q shift
  - NST daily
  - Labs 3x/week
  - BPP 2x/week
Mrs. FM

Episodes of severe HTN:
- Acutely treated with Adalat PA 10mg → BP down to 108/80 → plan changed to use IV labetalol instead
- Labetalol ↑ed to 200mg tid; Adalat XL 20mg bid added → later ↓ed to 20mg daily

NST – min variability but no decels

U/S Nov 28 - BPP 8/8, UA doppler ↑ resistive index (0.8) and S:D ratio (5.0 → 95%ile for GA), MCA doppler brain sparing

U/S Dec 3 - BPP reassuring, UA doppler AEDF, MCA doppler brain sparing, DV normal
Dec 7 (29 weeks):
- BP – 171/116 → to CR for cont EFM
- NST – min variability, intermittent small decels x < 1 min
- U/S – BPP 8/8, intermittent REDF
- Labs – Plt 149 (↓), ALT 41 (↑)
- BP treated with labetalol 20mg iv x 2 then 40mg iv x 1 → still > 160/110
- After discussion among Ob/Gyn, perinatal and Ob Med, decision made for urgent C/S → 980g infant, 6185, bag/mask resus only
Mrs. FM

Postpartum:

- HTN intermittently severe (Dec 8 – Dec 12) →
  - Adalat PA 10mg prn
  - Adalat XL 30mg bid, Labetalol 100mg bid
- Plt 104 (Dec 8) → 88 (Dec 10) → 133 (Dec 12)
- Hb 54 (Dec 8) → CT showed bladder flap and ant abdominal hematoma → 3U PRBC → Hb 111
- D/C’ed Dec 14
  - BP 120 – 140’s / 80 – 90’s
  - Hb 115, Plt 167
  - Rx for Adalat XL 30mg bid, Labetalol 100mg bid
Management of HDP
Bedrest: Does It Improve Outcomes?

- For preeclampsia – 2 RCTs, N=145:
  - Strict (vs. some) bedrest → NO improvement in maternal/perinatal outcomes → not recommended
- For GHTN (no preeclampsia) – 1 RCT, N=218:
  - In-pt management with AAT in ward (vs. out-pt routine activity) ↓ severe HTN (RR 0.58; 95% CI 0.38–0.89) and PTB (RR 0.53; 95% CI 0.29–0.99), but NO improvement in perinatal outcomes
- No RCTs on bedrest vs AAT

Conclusion: No evidence that bedrest improves outcomes, and may ↑ VTE risk → consider allowing ambulation

Meher et al. Cochrane Database of Systematic Reviews. 2007. CD003514.
Maternal and Fetal Surveillance – How Often?

- No large prospective studies validating frequency of monitoring

- Mild GHTN: out-pt
  - Maternal:
    - Self-assessment of adverse symptoms daily
    - BP and urine dipstick 2x/wk
    - Hb, Plt, Cr, ALT/AST weekly
      - Note: coag function tests NOT needed if plt and liver enzymes normal
  - Fetal:
    - NST, U/S for EFW and AFI → if normal, no need for repeat testing unless maternal condition changes

Maternal and Fetal Surveillance

- **Mild preeclampsia: out-pt**
  - Maternal:
    - Self-assessment of adverse symptoms daily
    - BP and urine dipstick daily
    - Hb, Plt, Cr, ALT/AST, 24h urine protein weekly
  - Fetal:
    - Kick count daily
    - NST (or BPP) weekly → 2x/wk if oligo/IUGR
    - U/S for growth and AFI q 3 weeks

- **Note:** Mild GHTN/preeclampsia may be managed as out-pt only if compliant, logistically feasible, and not progressing into severe disease

Maternal and Fetal Surveillance

Severe Preeclampsia: in-pt at tertiary centre

- Maternal:
  - BP, urine output, symptoms/signs of end-organ dysfn
  - Labs daily or more frequent

- Fetal:
  - Cont EFM → intermittent NSTs
  - U/S for BPP, AFI, EFW, Doppler

Severe HTN
sBP ≥ 160 or dBP ≥ 110

Confirm in 15 min then treat

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labetalol</td>
<td>20 mg iv → rpt 20-80 mg q 30 min or</td>
</tr>
<tr>
<td></td>
<td>1-2 mg/min iv</td>
</tr>
<tr>
<td></td>
<td>Max 300 mg (then switch to po)</td>
</tr>
<tr>
<td>Nifedipine</td>
<td>5-10 mg capsule bitten/swallowed q 30 min or</td>
</tr>
<tr>
<td></td>
<td>10 mg PA q 45 min</td>
</tr>
<tr>
<td></td>
<td>Max 80 mg/d</td>
</tr>
<tr>
<td>Hydralazine</td>
<td>5 mg iv → rpt 5-10 mg iv q 30 min or</td>
</tr>
<tr>
<td></td>
<td>0.5-10 mg/h iv</td>
</tr>
<tr>
<td></td>
<td>Max 20 mg</td>
</tr>
</tbody>
</table>

Non-Severe HTN
sBP 140–159 or dBp 90–109

- Targets:
  - No comorbid conditions: **130–155 / 80–105**
  - + comorbid conditions: **130–139 / 80–89**
  - Avoid low BP ➝ placental hypoperfusion

- Debate over tx of non-severe HTN
  - Systematic review 2006: 28 RCTs, N=3200
    - Use of drug(s) halved severe HTN (RR 0.50, 95% CI 0.41- 0.61)
    - No diff in pre-eclampsia, perinatal death, preterm birth, SGA
  - Meta-analysis 2000: 45 RCTs, N=3773
    - ↓ in MAP correlated to SGA and lower birth wt
      ➝ Placental hypoperfusion?

Abalos et al. Cochrane Database of Systematic Reviews 2006. CD002252.
Non-Severe HTN
sBP 140–159 or dBp 90–109

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labetalol</td>
<td>100-400mg bid-tid (max 1200mg/d)</td>
</tr>
<tr>
<td>Methyldopa</td>
<td>250-500mg bid-qid (max 2g/d)</td>
</tr>
<tr>
<td>Nifedipine</td>
<td>PA: 10-20mg bid-tid (max 180mg/d)</td>
</tr>
<tr>
<td></td>
<td>XL: 20-60mg daily (max 120mg/d)</td>
</tr>
</tbody>
</table>

Notes on Antihypertensive Drugs

- Labetalol and methyldopa used most frequently in Canada
  - Labetalol may be slightly more efficacious (10 trials, N=539; RR 0.75, 95% CI 0.58–0.94)

- No evidence of adverse pediatric long-term health or neurodevelopmental outcomes

- ACEI contraindicated in any trimester
  - T2/3: linked to IUGR, oligohydramnios, renal dysplasia
  - T1 (Cohort study 2006, N=29,507): linked to malformation of CVS (RR 3.72) and CNS (RR 4.39)
  - If pt was on ACEI/ARB pre-conception for renoprotection, restart postpartum (compatible with breastfeeding)

Cooper et al. NEJM 2006;354:2443-51.
Magnesium Sulfate and Eclampsia

**Tx of eclampsia:**
- MgSO4 more effectively reduces recurrent seizures than phenytoin (6 trials, N=897) or diazepam (7 trials, N=1441)

**Prevention of eclampsia:**
- MAGPIE: Multicentre RCT, N=10,141
- Antepartum or ≤ 24h postpartum, BP ≥ 140/90, proteinuria ≥ 1+, clinical uncertainty about using MgSO4
- IV: MgSO4 4g over 10-15min then 1g/h x 24h
- IM: MgSO4 5g in each buttock then 5g q4h x 24h
- Recurrent sz: 2g iv bolus over 5-10min
- MgSO4 reduced risk of eclampsia by 58% (95% CI 0.40–0.71), NNT=91

To Deliver or Not To Deliver?
Mode of Delivery

- Consider IOL first; C/S only for usual obstetrical indications
- IOL with severe preeclampsia takes more time and less successful than with normal BP
  - Success 60% at > 32 wks, 10% at < 26 wks
  - IUGR or oligohydramnios not contraindications - may consider oxytocin challenge test
  - Doppler findings:
    - ↑ resistance to diastolic flow → vaginal delivery rate > 50%
    - AEDF or REDF → most babies delivered by C/S
- If thrombocytopenic or DIC, ↑ risk of PPH
  - Do NOT use ergometrine! (↑ risk of stroke)

Management ≥ 36 Weeks

- SOGC Guidelines: Preeclampsia (severe or non-severe) → consider delivery

- HAPITAT study – multicentre RCT, N=383:
  - Population: 36-41 weeks, non-severe GHTN or preeclampsia
  - IOL vs expectant
  - 1° outcome: composite of poor *maternal* outcomes
    - Death, eclampsia, HELLP, pulmonary edema, VTE, placental abruption, progression to severe HTN or proteinuria, major PPH

Management ≥ 36 Weeks

- HAPITAT study
  - Results:
    - Poor maternal outcome in 31% of IOL group vs 44% of expectant group (RR 0.71, 95% CI 0.59-0.86, p<0.0001)
    - No eclampsia, maternal/neonatal death
  - Conclusion: IOL has better maternal outcome with non-severe HDP ≥ 36 weeks → recommended

Management 34 - 35 Weeks

- Non-severe preeclampsia → insufficient evidence to recommend delivery vs expectant
  - In addition to neonatal concerns, ↑ data that late preterm birth is associated with delayed academic performance

- Severe preeclampsia → delivery

Management 28 - 34 Weeks

- Non-severe preeclampsia → expectant
- Severe preeclampsia → deliver or expectant??

Cochrane Systematic Review:
- 2 RCTs (Sibai/Mercer 1994, Odenhaal 1990), N=133
  with severe preeclampsia, GA 28-34 weeks
- On admission:
  - Betamethasone
  - MgSO4 x 24 h
  - BP ≥ 160/110 treated

Churchill et al. Cochrane Database of Systematic Reviews 2002 CD003106.
Management 28 - 34 Weeks

- Cochrane Systematic Review:
  - Intervention group: C/S or IOL
  - Expectant group: bedrest, maternal and fetal monitoring

  - Indications for delivery:
    1) Reached 34 weeks
    2) Maternal deteriorations (oliguria, thrombocytopenia, ↑ ALT/AST, imminent eclampsia, severe HTN resistant to drugs)
    3) Fetal distress

Churchill et al. Cochrane Database of Systematic Reviews 2002 CD003106.
Management 28 - 34 Weeks

- Results:
  - Mean prolongation of pregnancy in expectant group = 7-14d
  - Maternal: no diff in eclampsia, renal failure, pulm edema, HELLP, C/S, abruption
  - Fetal/Neonatal:
    - No diff in death rate
    - Expectant group - ↓ RDS, NEC, NICU adm; ↑ SGA

- Conclusion: Expectant management improves perinatal outcome without compromising maternal outcome → recommended

**As long as close monitoring possible!

- Caveat: N was not large enough to study rare mat conditions (eg) NO incidence of eclampsia or pulmonary edema)

Churchill et al. Cochrane Database of Systematic Reviews 2002 CD003106.
Management 24 - 28 Weeks

- No RCT

- Sibai, retrospective review, N=84, 24-27+6 weeks, severe preeclampsia:
  - N=30 → immediate delivery 48h after steroids
  - N=54 → expectant management
    - Bed rest, steroids, antihypertensive tx for DBP > 100, MgSO4 x 24-72h, close surveillance
    - Pregnancy continued until onset of maternal/fetal complications

Management 24 - 28 Weeks

- Retrospective review:
  - Results of expectant management (vs delivery):
    - Mean prolongation 13.2d (range 2-26d)
    - Sig. ↑ perinatal survival (76.4% vs 35%)
    - Sig. ↑ birth wt (880g vs 709g)
    - Sig. ↓ neonatal complications
    - No diff in maternal complications

- Conclusion: Expectant management improves perinatal outcome without compromising maternal outcome → recommended
  **As long as close monitoring possible!

## Management < 24 Weeks: Retrospective Studies on Expectant Management

<table>
<thead>
<tr>
<th>Study</th>
<th>N</th>
<th>GA (wks)</th>
<th>Preg Prolongation (days)</th>
<th>Perinatal Mortality (Wks = GA at admission)</th>
<th>Maternal Mortality</th>
<th>Major Maternal Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pattinson et al (1988)</td>
<td>45</td>
<td>&lt;24</td>
<td>14</td>
<td>100%</td>
<td>4% (1 case)</td>
<td>Eclampsia - 19% HELLP - 62% Pulm edema - 15%</td>
</tr>
<tr>
<td>Budden et al (2006)</td>
<td>31</td>
<td>&lt;25</td>
<td>6 [2-46]</td>
<td>23wks - 100% 24wks - 38%</td>
<td>0%</td>
<td>Eclampsia - 0% HELLP - 66% Renal insuff - 26%</td>
</tr>
<tr>
<td>Bombrysts et al (2008)</td>
<td>46</td>
<td>&lt;27</td>
<td>6 [2-46]</td>
<td>&lt;23wks - 100% 23 wks - 80% 24 wks - 29% 25 wks - 24% 26 wks - 10%</td>
<td>0%</td>
<td>Eclampsia - 2% HELLP - 24% Abruption - 13% Pulm edema - 4% Renal insuff - 4%</td>
</tr>
</tbody>
</table>
Management < 24 Weeks

- Conclusion: Expectant management <24 weeks → high perinatal mortality and maternal morbidity
  → Termination of pregnancy should be offered after extensive counseling

Management of HELLP

- Haddad et al - no stat diff in adverse maternal or neonatal outcomes of HELLP vs severe preeclampsia ≤ 28 weeks (N=64)

- Delivery concerns:
  - IOL in nullips <30 wks often very prolonged → may consider C/S outright as risk of eventually requiring C/S high
  - Intra- and postop oozing common → consider leaving sub/suprafascial drains to ↓ need for repeat laparotomy

Baxter et al. Obst and Gyn Survey 2004:59(12);838-845.
Management of HELLP

**SOGC Guidelines:**

- Consider transfusing plt < 50x10^9/L, plt falling rapidly, and/or coagulopathy
- Strongly consider transfusing plt < 20x10^9/L for C/S and vaginal delivery
- Plt may contain RBCs (4U plt can contain up to 2ml RBCs) → give WinRho 300mcg if Rh -ve
- Consider steroids when plt < 50x10^9/L
  - Systematic review:
    - Improvement in BP, urine output, lab values (plt and liver enzymes), BUT
    - No diff in mat/perinatal outcomes

Postpartum Treatment

- ~50% with HDP have PP HTN
- BP often peaks at PP day 3-6 due to fluid shifts
- Proteinuria and adverse conditions may worsen for few days PP
- Tx of PP HTN:
  - $\geq 160/110$ – treat in same manner as with antepartum
  - Non-severe with comorbidities: treat (as per Cdn HTN guidelines)
  - Non-severe without comorbidities: insufficient data
- Consider thromboprophylaxis in women with preeclampsia, esp. post C/S or antenatal bedrest > 4 days (unproven benefit)

Postpartum Resolution of GHTN and Proteinuria – How Long Does It Take?

Berks et al - prospective cohort study, N=205 with preeclampsia
- F/U at 1.5, 3, 6, 12, 18, and 24 mo PP
- Results:
  - HTN: 39% + at 3 mo PP → 18% + at 2 yrs PP
    - Resolution time ↑ with higher max BP and with longer dx-to-delivery interval
  - Proteinuria: 14% + at 3 mo PP → 2% + at 2 yrs PP
    - Resolution time ↑ with higher max proteinuria
  - GA at onset of preeclampsia not correlated with resolution time of HTN and proteinuria
- Conclusion: Up to 2 yrs for HTN and proteinuria to resolve → may postpone further invasive work-up for underlying renal disease until 2 yrs PP

Take-Home Points

- Classification:
  Gestational/preexisting HTN
  ± Preeclampsia
  ± Comorbid conditions

- 24h urine for proteins still gold standard
- No evidence for bedrest
- No RCTs on frequency of maternal/fetal surveillance
- Debate over whether or not to treat non-severe GHTN
Take-Home Points

- Management:
  - ≥ 36 weeks: deliver
  - 34 – 35 weeks:
    - Severe preeclampsia → deliver
    - Non-severe preeclampsia → insufficient data
  - 24 - 34 weeks: expectant
  - < 24 weeks: offer termination of pregnancy
Take-Home Points

- Postpartum:
  - Treat severe HTN and non-severe HTN with comorbidities
  - Insufficient data on tx of non-severe HTN w/o comorbidities
  - GHTN and proteinuria do not resolve in many women for prolonged period of time
  - Follow-up important
THANK YOU!!
Special Thanks to Dr. Venu Jain