Perinatal Transmission of Hepatitis B

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Objectives

- Barriers to appropriate PEP
- Post-Vaccine Serology Testing
- Risk factors for perinatal transmission
- Results from our retrospective study
- Anti-viral treatment in pregnancy
PROTECT NEWBORNS FROM HEPATITIS B AND LIVER CANCER

FOR NEWBORNS OF HBsAg-POSITIVE MOTHERS

☐ Give 2 shots at birth:
  • Hepatitis B vaccine
  • Hepatitis B Immunoglobulin (HBIG)

☐ Remind the mother to inform her pediatrician to:
  • Complete the vaccine series
  • Get baby tested at 9-18 months to see if the baby is protected

☐ Remind the mother to see a doctor for long term care of chronic hepatitis B
Early Infection = Chronic Infection

Outcome of HBV Infection by Age at Infection

<table>
<thead>
<tr>
<th>Age at Infection</th>
<th>Chronic Infection (%)</th>
<th>Symptomatic Acute Hep B (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>1-6 mo</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>7-12 mo</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>1-4 yrs</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>&gt;5 yrs</td>
<td>20</td>
<td>80</td>
</tr>
</tbody>
</table>
Barriers to Providing Appropriate Post-Exposure Prophylaxis
Efficacy of PEP to Prevent Perinatal HBV Transmission

- Hep B vaccine alone 75% effective
- HBIG alone 71% effective
- Combined efficacy = 94%
- 3 dose vaccine results in protective anti-HBs > 10mIU/mL in 98% of healthy infants
  - Lower seroprotection in premature infants

Beasley et al. Lancet. 1983
Schillie et al. Vaccine. 2012
Vaccination Coverage

• Children Aged 19-35 months – 2010-2014
  – Hep B > 3 doses
    • 2010 = 91.8% (±0.7)
    • 2014 = 91.6% (±0.9)
  – 1 dose by 3 days of birth
    • 2010 = 64.1% (±1.3)
    • 2014 = 72.4% (±1.5)
    • Similar among racial/ethnic groups
  – Hep B (birth)
    • California = 63.9% (±8.1)

MMWR 2015 August 64 (33);889-896
Barriers to PEP in Birth Hospitals

• Chart review of 190 delivery hospitals (2005-2006)
  – 62.1% born to HBsAg + moms received HBIG+HBV in 12 hours
  – 52.4% of infants with HBsAg unknown mothers
  – Strongest predictor = Written hospital policy

• AAP Survey of 380 pediatricians
  – Only 50% offered HBV birth dose to all infants
  – More likely if urban, academic, written policy

• UofColorado study – More likely to refuse if...
  – Higher maternal education, higher maternal income, lack of a written policy

Pediatrics 2010;125:704–11
Pediatrics 2001;108(6)
Pediatr Infect Dis J 2012 Jan;31 (1)
Table 3. Quotes on Theme 1: Lack of Self-efficacy

<table>
<thead>
<tr>
<th>Description</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunity for exchange of dialogue about hepatitis B</td>
<td>“I know that when they first come in for their prenatal visit, that’s the best time to discuss something like hepatitis B because that’s when it hits them the most. That’s when they retain the most because they’re pregnant; they want to make sure their babies are okay.”</td>
</tr>
<tr>
<td>Providing hepatitis B related information</td>
<td>“I don’t feel particularly comfortable about educating patients about hep[atitis] B because I don’t have the information.”</td>
</tr>
<tr>
<td>Poor preparation during medical/nursing school</td>
<td>“I don’t really remember being ever taught that hepatitis B was such a huge public health threat. We were never told that it was so much more widespread than HIV/AIDS, and we never knew that so many people had it. If anything, I just remember being taught how infectious it was and how easy it was for healthcare providers to get it if they weren’t vaccinated. It was as if hepatitis B was only a threat for healthcare providers.”</td>
</tr>
<tr>
<td>Medical hierarchy</td>
<td>“A lot of medicine is about the hierarchy. The older doctors who have been doing it the longest are the ones on top so they have the biggest say in what we learn and how learn it. But they’re the ones who have been out of med school the longest, and they’re so set in their ways that were up-to-date 20 years ago but not today. I mean this hierarchy isn’t unique to medicine, but look at...”</td>
</tr>
</tbody>
</table>
## Table 4. Quotes on Theme 2: Patient “Cues”

<table>
<thead>
<tr>
<th>Description</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient cues</td>
<td>“It’s not like I just say whatever I want. I try to get to know them so I know what they want to know about and what they think is important. I look for certain cues.”</td>
</tr>
<tr>
<td>Stigma</td>
<td>“She didn’t want me to talk about it in front of her husband because she was scared of the mother-in-law. So I tried to be discreet, but it was hard to talk about it when she didn’t even want to hear it.”</td>
</tr>
<tr>
<td>Apathy</td>
<td>“If the patients are not concerned, I usually don’t have time to explain what hepatitis B is fully to them because there just isn’t time. I’m not going to waste their time and my time on something they’re not really concerned about.”</td>
</tr>
<tr>
<td>Patients’ preferential concern for short-term health issues</td>
<td>“We don’t usually have that much time with the mother to spend talking about long-term health. You have to remember that we deal with people that cry and complain, which makes sense because they’re in pain. So it’s different. Right after delivery, we try to initiate breastfeeding and we try to do the charts, so we don’t have that much time.”</td>
</tr>
<tr>
<td>Doubt about the efficacy of patient education</td>
<td>“We have to be realistic. Do I think enough is being done? I hope so. I mean you can try to tell me the information again and again, but I don’t know how much they’re going to do with what we tell them. You can bring the horse to the bucket, but you can’t force them to drink.”</td>
</tr>
</tbody>
</table>
Table 5. Quotes on Theme 3: Environmental Factors

<table>
<thead>
<tr>
<th>Description</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>“It’s also so busy, busy, busy. There’s never enough time for one more thing.”</td>
</tr>
<tr>
<td>Lack of educational resources</td>
<td>“We don’t have any materials on hand. We have to go somewhere and get something, but I don’t really know where, and I usually don’t have the time. I think we might be supposed to ask infectious diseases, but that’s far away.”</td>
</tr>
<tr>
<td>Importance of educational resources</td>
<td>“It needs to be written down because we can tell the patients that they need to come in later to complete the vaccination series, but there’s no way the moms are going to remember that after dealing with screaming, crying babies. It also needs to be in the right languages. In the hospital, we can use a translator, but I’m assuming all of these women don’t have personal translators at home.”</td>
</tr>
<tr>
<td>Importance of accurate educational resources</td>
<td>“You know, with more people on the internet, everything is going global now. It’s dangerous because there are crazy people who post things like vaccines cause autism. But then it can also be a good thing if there’s info about hep[atitis] B and the vaccine and how much kids need it online. Then the doctors need to tell their patients what’s right and what’s wrong from the internet.”</td>
</tr>
<tr>
<td>Failures in the system</td>
<td>“I know that [an HMO] keeps these asthma registries, and every time their patients need to go in for a check-up, [the HMO] calls them. Couldn’t the government or insurance company do the same thing for hep[atitis] B vaccines or the 6-month visits for people with hep[atitis] B?”</td>
</tr>
</tbody>
</table>

Post Vaccine Serology Testing
Enhanced Perinatal HBV Case Management Projects

• Florida, Michigan, Minnesota, New York City, Texas

• Out of 4,214 infants completed > 3 Hep B doses
  – 63.7% had PVST + 13.3% had PVST at unknown age
  – 23% had no PVST
  – Less likely if Hispanic, US born and primary English speaking

• Overall perinatal transmission
  – 1.2% infected, 3.2% susceptible, 2.3% indeterminate

PVST Testing and Infection Rate for California
PVST Too soon or Too late

- Goal 1-2 months after final dose
- Too soon
  - Results for HBsAg can be transiently positive for 1–18 days after vaccination
  - Before 9 months can detect passive anti-HBs from HBIG administered at birth
- Too late
  - Low titers lead to unnecessary revaccination

Schillie et al. MMWR Oct 2015
Anti-HBs Levels

FIGURE. Proportion of infants with anti-HBs ≥10 mIU/mL with increasing interval from final vaccine dose.*

Proportion of infants

Antibody negative
Antibody positive

Months after final vaccine dose

1-2  3-4  5-6  7-8  9-10  11-12  13-14  15-16

Schillie et al. MMWR Oct 2015
Shortened Interval for PVST

- Benefit to **PVST at 9-12 months**
  - Opportunity at 2 well-child visits
  - Reduced risk for horizontal transmission from close contacts
  - Avoid unnecessary vaccination
  - Increase adherence
  - Conserve public health case management resources
Risk factors for Perinatal Transmission of HBV
Risk for Transmission

• Amniocentesis or CVS – No!
  – Counseling that risk for transmission may increase with HBV viral load > 7log10 copies/ml

• Breastfeeding – No!

• C-section – No!

• HBIG to pregnant mothers - Controversial

Tita et al. AJOG. 2016.
HBIG for Prevention

• No differences in prophylaxis effective rates compared to placebo
• Recent Cochrane review (36 studies)

Quality of the evidence

Due to the very low to low quality evidence in this review, we do not know if antenatal HBIG administration has an effect on the proportion of newborns with HBsAg and HBV-DNA compared with no treatment. We could draw no conclusions about death of newborns or mothers as we found no data.

Eke AC et al. Cochrane Database Syst Rev. 2017
Perinatal Transmission: An Australian Experience

- 313 HBsAg positive women
  - 213 mothers with detectable HBV DNA
    - 32% had > $10^8$ copies/mL
    - 43% HBeAg positive
  - 138 babies followed-up at 9 months of age
    - 4 infants (3%) were HBsAg positive (infected)
    - All born to mothers with > $10^8$ copies/mL and HBeAg+
    - One infant did not receive HBIG

3 Perinatal transmission rates

HBeAg = hepatitis B “e” antigen. HBV = hepatitis B virus. * P = 0.031 from mothers with low or high compared with very high HBV DNA levels.

Perinatal Transmission: A Taiwanese Experience

- Prospective observational cohort
  - 303 HBsAg positive mother-infant pairs
  - Overall infection rate: 3.3%

<table>
<thead>
<tr>
<th>HBV DNA levels (copies/mL)</th>
<th>Rate of Immunoprophylaxis Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>$7 \log_{10}$</td>
<td>6.6%</td>
</tr>
<tr>
<td>$8 \log_{10}$</td>
<td>14.6%</td>
</tr>
<tr>
<td>$9 \log_{10}$</td>
<td>27.7%</td>
</tr>
</tbody>
</table>

Fig. 2. **Viral load distributions.** (A) HBeAg-negative and (B) HBeAg-positive mothers.
Perinatal Transmission: A Northern California Experience

- Kaiser Observational study (1997-2010)
  - 4446 infants born to 3253 HBsAg positive mothers
  - From 2006-2010*
    - 87% received timely PEP
    - 94% completed PVST
- Overall 0.75% infection rate
  - If viral load >5x10^7 IU/mL: 3.6%
  - No transmission at lower viral loads

CA DPH PHPP
RETROSPECTIVE CHART REVIEW
AIM

• To evaluate maternal hepatitis B virus (HBV) DNA as risk for perinatal HBV infection among infants born to HBsAg-positive mothers who received post vaccination serologic testing (PVST) between 2005 and 2011 in California.

Burgis et al. World J Gastro. 2017 (manuscript accepted)
METHODS

• Demographic information was PHPP database and matched to birth certificate records.
• HBV DNA level and HBeAg status were obtained from providers and three large commercial laboratories (Quest, LabCorp, ARUP)
  – Women age 14-51 years
  – One year before and one year after delivery
• Predefined high HBV DNA level of > 2x10^7 IU/ml
Results

- 17,687 infants born to HBsAg positive mothers in California between Jan 1, 2005 and Dec 31, 2011.
- 11,473 infants with PVST (64.8%)
- Only 125 (1.1%) were HBV infected
- PEP errors occurred in 9 infected infants
  - No significant difference between infected and uninfected infants
  - Most common error – late or incomplete HepB series
Table 1: Univariate analysis of infant characteristics among those with maternal HBV DNA results

<table>
<thead>
<tr>
<th>Infant Characteristics</th>
<th>Cases (n = 27)</th>
<th>Controls (n = 135)</th>
<th>OR</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>17 (63.0)</td>
<td>73 (54.1)</td>
<td>Reference</td>
<td>0.398</td>
</tr>
<tr>
<td>Female</td>
<td>10 (37.0)</td>
<td>62 (45.9)</td>
<td>0.693 (0.296 – 1.623)</td>
<td></td>
</tr>
<tr>
<td>Birthweight*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 2500g</td>
<td>25 (92.6)</td>
<td>121 (89.6)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>&lt; 2500g</td>
<td>2 (7.4)</td>
<td>14 (10.4)</td>
<td>0.692 (0.148 – 3.235)</td>
<td>0.640</td>
</tr>
<tr>
<td>Gestational Age†</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full term</td>
<td>25 (92.6)</td>
<td>116 (85.9)</td>
<td>Reference</td>
<td>0.437</td>
</tr>
<tr>
<td>Preterm</td>
<td>2 (7.4)</td>
<td>17 (12.6)</td>
<td>0.546 (0.118 – 2.515)</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>0 (0)</td>
<td>2 (1.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Errors with HBIG or Birth Dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>26 (96.3)</td>
<td>132 (97.8)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Any</td>
<td>1 (3.7)</td>
<td>3 (2.2)</td>
<td>1.692 (0.169 – 16.912)</td>
<td>0.654</td>
</tr>
<tr>
<td>Late or Incomplete Series</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>24 (88.9)</td>
<td>117 (86.7)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3 (11.1)</td>
<td>18 (13.3)</td>
<td>0.813 (0.222 – 2.978)</td>
<td>0.754</td>
</tr>
</tbody>
</table>

Data are n (%).

* Birthweight defined by different ACIP recommendations for vaccination at this weight threshold.
† Full term defined as ≥ 37 weeks and preterm defined as < 37 weeks gestation.
Table 2: Univariate analysis of maternal characteristics among infants with maternal HBV DNA results

<table>
<thead>
<tr>
<th>Maternal Characteristics</th>
<th>Cases (n = 27)</th>
<th>Controls (n = 135)</th>
<th>OR</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 25</td>
<td>5 (18.5)</td>
<td>17 (12.6)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>25-34</td>
<td>14 (51.9)</td>
<td>75 (55.6)</td>
<td>0.635 (0.201 – 2.002)</td>
<td>0.438</td>
</tr>
<tr>
<td>≥ 35</td>
<td>8 (29.6)</td>
<td>43 (31.9)</td>
<td>0.633 (0.181 – 2.209)</td>
<td>0.473</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Asian/Pacific Islander</td>
<td>1 (3.7)</td>
<td>21 (15.6)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>26 (96.3)</td>
<td>114 (81.4)</td>
<td>4.790 (0.616 – 37.234)</td>
<td>0.129</td>
</tr>
<tr>
<td><strong>Foreign born</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>2 (7.4)</td>
<td>17 (12.6)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>25 (92.6)</td>
<td>118 (87.4)</td>
<td>1.801 (0.391 – 8.295)</td>
<td>0.450</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greater than High school</td>
<td>14 (51.9)</td>
<td>74 (54.8)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>High school or less</td>
<td>13 (48.2)</td>
<td>61 (45.2)</td>
<td>1.126 (0.492 – 2.577)</td>
<td>0.778</td>
</tr>
<tr>
<td><strong>Insurance Prenatal Care</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non- Government</td>
<td>16 (59.3)</td>
<td>63 (46.7)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>10 (37.0)</td>
<td>72 (53.3)</td>
<td>0.547 (0.232 – 1.292)</td>
<td>0.169</td>
</tr>
<tr>
<td>Unknown</td>
<td>1 (3.7)</td>
<td>0 (0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Primigravid</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>12 (44.4)</td>
<td>76 (56.3)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>15 (55.6)</td>
<td>59 (43.7)</td>
<td>1.610 (0.701 – 3.699)</td>
<td>0.262</td>
</tr>
<tr>
<td><strong>Nulliparous</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>11 (40.7)</td>
<td>65 (48.2)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>16 (59.3)</td>
<td>70 (51.9)</td>
<td>1.351 (0.584 – 3.124)</td>
<td>0.482</td>
</tr>
<tr>
<td><strong>Delivery Type</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non Cesarean</td>
<td>21 (77.8)</td>
<td>100 (74.1)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Cesarean</td>
<td>5 (18.6)</td>
<td>35 (25.9)</td>
<td>0.680 (0.239 – 1.942)</td>
<td>0.472</td>
</tr>
<tr>
<td>Unknown</td>
<td>1 (3.7)</td>
<td>0 (0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data are n (%).
Table 3. Association between maternal laboratory results and infant HBV infection

<table>
<thead>
<tr>
<th>Maternal laboratory results</th>
<th>Cases (n = 27)</th>
<th>Controls (n = 135)</th>
<th>OR</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBV DNA Levels</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 2 x 10^7 IU/mL</td>
<td>2 (7.4)</td>
<td>110 (81.5)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>≥ 2 x 10^7 IU/mL</td>
<td>25 (92.6)</td>
<td>25 (18.5)</td>
<td>54.499 (12.219 – 247.550)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>HBeAg Results</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>1 (3.7)</td>
<td>96 (71.1)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>19 (70.4)</td>
<td>39 (28.9)</td>
<td>46.757 (6.051 – 361.317)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Unknown</td>
<td>7 (25.9)</td>
<td>0 (0.0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data are n (%).
Some mothers had HBV DNA and HBeAg testing.

HBV DNA threshold 2 x 10^7 IU/mL
Figure 1 Distribution of HBV DNA level between case and control mothers

Proportion of Mothers

HBV DNA level (IU/mL)  
- Undetectable
- 1 log10
- 2 log10
- 3 log10
- 4 log10
- 5 log10
- 6 log10
- 7 log10
- 8 log10

Cases Controls
Conclusions

• Overall infection rate is low = 1.1%
• Only 65% of at-risk infants had PVST
• No differences in PEP errors but PEP errors occurred in >10% of at-risk infants
• Most significant risk factor for perinatal transmission is HIGH HBV DNA PCR
ANTI-VIRAL THERAPY DURING PREGNANCY
To treat or not to treat?

Recommendations

8A. The AASLD suggests antiviral therapy to reduce the risk of perinatal transmission of hepatitis B in HBsAg-positive pregnant women with an HBV DNA level >200,000 IU/mL.

Quality/Certainty of Evidence: Low
Strength of Recommendation: Conditional

In 11 controlled studies (1,504 mother-infant pairs) examining the use of any antiviral therapy in the third trimester, a significant reduction in perinatal transmission was reported (RR, 0.32; 95% CI: 0.23-0.46).

2. The only antivirals studied in pregnant women are lamivudine, telbivudine, and tenofovir.
3. Antiviral therapy was started at 28-32 weeks of gestation in most of the studies.
4. Antiviral therapy was discontinued at birth to 3 months postpartum in most of the studies. With discontinuation of treatment, women should be monitored for ALT flares every 3 months for 6 months.
5. There are limited data on level of HBV DNA for which antiviral therapy is routinely recommended. The level of >200,000 IU/mL (1 million copies/mL) is a conservative recommendation.
80% decrease in vertical transmission of HBV
BUT
High rate of resistance
High rate of post partum flare in LFTs with cessation of therapy

Shi et al. Obstetrics and Gynecology. 2010
Xu wt al. JVH 2009.
Telbivudine

No significant adverse events or complications

Tenofvir to Prevent Hepatitis B Transmission in Mothers with High Viral Load

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RESULTS

At delivery, 68% of the mothers in the TDF group (66 of 97 women), as compared with 2% in the control group (2 of 100), had an HBV DNA level of less than 200,000 IU per milliliter (P<0.001). At postpartum week 28, the rate of mother-to-child transmission was significantly lower in the TDF group than in the control group, both in the intention-to-treat analysis (with transmission of virus to 5% of the infants [5 of 97] vs. 18% [18 of 100], P=0.007) and the per-protocol analysis (with transmission of virus to 0 vs. 7% [6 of 88], P=0.01). The maternal and infant safety profiles were similar in the TDF group and the control group, including birth-defect rates (2% [2 of 95 infants] and 1% [1 of 88], respectively; P=1.00), although more mothers in the TDF group had an increase in the creatine kinase level. After the discontinuation of TDF, alanine aminotransferase elevations above the normal range occurred more frequently in mothers in the TDF group than in those in the control group (45% [44 of 97 women] vs. 30% [30 of 100], P=0.03). The maternal HBV serologic outcomes did not differ significantly between the groups.
suggest HBV viral load testing in the third trimester (grade 2B). In pregnant women with HBV infection and viral load >6-8 log 10 copies/mL, HBV-targeted maternal antiviral therapy should be considered for the purpose of decreasing the risk of intrauterine fetal infection (GRADE 2B). In pregnant women with HBV infection who are candidates for maternal antiviral therapy, we suggest tenofovir as a first-line agent (GRADE 2B).

Controversies of Anti-Viral Therapy

• Withdrawal of therapy may precipitate hepatitis
  – Flares are common (15-50%), often mild severity, most spontaneously resolve

• Anti-Retroviral Pregnancy Registry
  – Safety is well studied, no increased birth defects (1-2%)

• Anti-viral resistance

• Small amount of drug detected in breastmilk

Nguyen et al. Aliment Pharm Ther. 2014
Cost Effective Strategy

- Anti-viral prophylaxis would...
  - Prevent additional 489 chronic infections
    - 9.7 cases of chronic HBV infection per 100 treated
  - Saving 800 QALYS
  - Saving $2.8 million
    - Save $5184 per 100 women treated

CONCLUSIONS
Prevention is Key!

- Post-exposure prophylaxis is EFFECTIVE
- PVST needs to be TIMELY
- Obtain Prenatal HBV DNA PCR
  - Appropriate counseling to mother
- Chronic HBV care for mother
  - Screen and vaccinate household contacts

Fan et al. Obstetrics and Gynecology. 2014
Future Research on Anti-Viral Therapy

• Appropriate HBV DNA threshold
• Exact week in third trimester to start
• Duration of therapy
• Longitudinal follow-up of infants exposed to medications
• Safety of breastfeeding
Thank You

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MONITORING PEDIATRIC PATIENTS WITH CHRONIC HBV INFECTION
Surveillance

• Verify Hep B vaccine series and HBIG
• Household contacts/siblings to be screened
• Baseline labs: AST, ALT, CBC, HBeAg, Anti-HBe, Anti-HBc, HBV DNA PCR, AFP
• Baseline Abdominal Ultrasound
• Long term monitoring:
  – ALT and AFP every 6-12 months
  – HBeAg, Anti-HBe, HBV DNA PCR every 12 months
  – Abdominal Ultrasound every 1-2 years