Prevalence of hepatitis B in pregnancy and vertical transmission rate of HBV in Africa: A systematic review

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IAMANEH/Geneva-Yaounde cooperation scholarship

Training Course in Reproductive Health Research
WHO 2007

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Dr Ana Pilar Betran (WHO)
Outline

Background
Objectives
Methodology
Results
Discussion
Conclusion
Recommendations
Why this research questions

To demonstrate the importance of:

- **Systematic** HBV screening during pregnancy in Africa
- Taking **special care** of newborns from positive mothers
Background

- Hepatitis B is a major public health problem in the developing countries of Africa and Asia (prevalence > 8%)
- 2 billion have markers of current or past infection
- 350 million have chronic infection
  - 15-25% will die from chronic liver disease (liver cancer and cirrhosis) at least 1 million deaths per year
- Young children who become infected with HBV are the most likely to develop chronic infection
- 25% mortality in perinatal acquired disease
- Hepatitis B-associated hepatocellular carcinoma is probably the most common tumour affecting males in sub-Saharan Africa
Geographic Distribution of Chronic HBV Infection

**HBsAg Prevalence**

- ≥8% - High
- 2-7% - Intermediate
- <2% - Low

**High (>8%):** 45% of global population
- Lifetime risk of infection >60%
- Early childhood infections common

[Map showing the geographic distribution of HBsAg prevalence across the world]
The vaccine will not cure chronic hepatitis, but it is 95% effective in preventing chronic infections from developing, and is the first vaccine against a major human cancer.

In 1991, the WHO called for all children to receive the hepatitis B vaccine.

Children in the poorest countries, who need the vaccine the most, have not been receiving it because of many reasons.

Nowadays the vaccine is available in most African countries, and children are getting vaccinated, from six weeks after birth.
Outcome of Hepatitis B Virus Infection by Age at Infection

- Chronic Infection (%)
  - Birth
  - 1-6 mos
  - 7-12 mos
  - 1-4 yrs
  - Older Children and Adults

- Symptomatic Infection (%)
  - 0%
  - 20%
  - 40%
  - 60%
  - 80%
  - 100%

CDC
Hepatitis B – Clinical Features

- **Incubation period:** Average 60-90 days
  Range 45-180 days

- **Clinical illness (jaundice):**
  <5 yrs, <10%
  >5 yrs, 30%-50%

- **Acute case-fatality rate:** 0.5%-1%

- **Chronic infection:**
  <5 yrs, 30%-90%
  >5 yrs, 2%-10%

- **Premature mortality from chronic liver disease:** 15%-25%

Pregnancy is well tolerated by women who are chronic carriers of hepatitis B
Hepatitis B Disease Progression

- **Acute Infection**
- **Chronic Infection**
- **Cirrhosis**
- **Liver Failure ( Decompensation)**
- **Liver Cancer (HCC)**
- **Liver Transplantation**
- **Death**

- **Progression to Chronic Infection**
  - >90% of children
  - <5% of adults

- **30% progress to Cirrhosis**
  - 30 – 40 years

- **23% of Cirrhotics decompensate within 5 years**

- **5%-10% develop HCC**

References:
Vertical transmission of HBV

♣ Rate of transmission: HBeAg-positive ~85%
    HBeAg-negative ~10%

♣ Transmission at birth is more likely if the mother is: HBeAg positive B or has high circulating levels of HBV-DNA

♣ The placenta forms an excellent barrier against transmission of this large virus (DNA) and intrauterine infection is rare

Thus vertical transmission is effective during delivery
Prevention of vertical transmission

♣ Active (vaccine) and passive (HBIG) immunisation interrupts transmission in over 90%

♣ What about Lamivudine during the last trimester of pregnancy?

♣ The best protocol seems to be:
  ♠ HBV vaccine at birth and every 4 weeks (3 doses)
  ♠ HBIG at birth and 4 weeks later
Objectives

- To provide comprehensive and reliable information on available data on global prevalence of hepatitis B in pregnant women in Africa
- To assess the vertical transmission rate of HBV to newborns
Methods of review

- Electronic: Pubmed, WHO regional databases
- Manual search of references from original articles
- Keywords:
  - Hepatitis B AND pregnancy AND Africa
- Inclusion criteria:
  - All studies done in Africa emphasizing on prevalence and vertical transmission
- Exclusion criteria: Case report, brief communications
- Total of 144 articles were retrieved, 10 were eligible for prevalence, and 4 for vertical transmission.
## Prevalence rates of HBV in pregnant women

<table>
<thead>
<tr>
<th>S. No</th>
<th>Author Year</th>
<th>Country</th>
<th>Study design</th>
<th>Setting sampling frame</th>
<th>Sample size</th>
<th>Prevalence HBsAg</th>
<th>Preval HBeAg</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Madzime 1997</td>
<td>Zimbabwe</td>
<td>C S</td>
<td>Hospital</td>
<td>984</td>
<td>25%</td>
<td>3.3%</td>
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<td>Burkina Faso</td>
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<td>Hospital</td>
<td>917</td>
<td>10.7%</td>
<td>18.2%</td>
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<td>3</td>
<td>Rouet 2004</td>
<td>Ivory Coast</td>
<td>C S</td>
<td>Hospital</td>
<td>1002</td>
<td>9%</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Sidibe 2001</td>
<td>Mali</td>
<td>C S</td>
<td>Hospital</td>
<td>829</td>
<td>15.5%</td>
<td>-</td>
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<tr>
<td>5</td>
<td>Ahmed 1995</td>
<td>Malawi</td>
<td>C S</td>
<td>Hospital</td>
<td>253</td>
<td>13%</td>
<td>-</td>
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<td>6</td>
<td>Oshitani 1995</td>
<td>Zambia</td>
<td>C S</td>
<td>Hospital</td>
<td>2098</td>
<td>6.5%</td>
<td>16.1%</td>
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<tr>
<td>7</td>
<td>Itoua 1995</td>
<td>Congo brazza</td>
<td>C S</td>
<td>Hospital</td>
<td>292</td>
<td>6.5%</td>
<td>2.7%</td>
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<td>Ndumbe 1992</td>
<td>Cameroon</td>
<td>C S</td>
<td>Hospital</td>
<td>1014</td>
<td>25%</td>
<td>5.2%</td>
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<tr>
<td>9</td>
<td>Acquaye 1994</td>
<td>Ghana</td>
<td>C S</td>
<td>Hospital</td>
<td>692</td>
<td>6.4%</td>
<td>15%</td>
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<tr>
<td>10</td>
<td>Marinier 1985</td>
<td>Senegal</td>
<td>C S</td>
<td>Hospital</td>
<td>1442</td>
<td>9.8%</td>
<td>19.8%</td>
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## Perinatal transmission rates

<table>
<thead>
<tr>
<th>S. N°</th>
<th>Author</th>
<th>Year</th>
<th>Country</th>
<th>Study design</th>
<th>Setting sampling frame</th>
<th>Sample size</th>
<th>Prevalence HBsAg</th>
<th>M-C trans. rate</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Roingeard</td>
<td>1993</td>
<td>Senegal</td>
<td>Cohort</td>
<td>Hospital</td>
<td>152</td>
<td>13.8%</td>
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<td>1975</td>
<td>South Africa</td>
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<tr>
<td>3</td>
<td>Badawy</td>
<td>2000</td>
<td>Egypt</td>
<td>Cohort</td>
<td>Hospital</td>
<td>352</td>
<td>15.3%</td>
<td>51.8%</td>
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<tr>
<td>4</td>
<td>Menendez</td>
<td>1999</td>
<td>Tanzania</td>
<td>Cohort</td>
<td>Hospital</td>
<td>980</td>
<td>6.3%</td>
<td>8%</td>
</tr>
</tbody>
</table>
Results

Total number of pregnant women tested : 9523

Prevalence of HBsAg : 6.5 to 25%

Prevalence of HBeAg : 2.7 to 19.8% of HBsAg pos.

Vertical transmission : 7 and 57.8% of HBsAg pos.
Discussion

- All the studies dealing with prevalence and vertical transmission rate are from Africa.
- We could not have any study from Africa talking about care for newborns from infected women.
- Prevalence of HBsAg between 6.5 and 25%.
- Proportion of infections acquired perinatally in Africa varies between 7 to 51.8%, probably because of low prevalence of HBeAg or low circulating levels of HBV-DNA.
Conclusions

- Africa is an hyperendemic region for HBV

- The prevalence within pregnant women is almost the same as in the general population

- Low proportion of chronic infections acquired perinatally in Africa
Recommendations

- Systematic screening for hepatitis B during antenatal care (from 28 weeks of pregnancy)
- Early passive/active immunisation of babies born from all HBsAg-positive mothers is advocated. For that, HBIG should be available
- Of course, the national programme of vaccination should be continued, trying to reach all the children.
Merci pour votre aimable attention

Thank you for lending me your ears