Hepatitis C in Pregnancy

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Hepatitis C (HCV) in Pregnancy

How many pregnant American Indian/Alaskan Native women are HCV positive?

&

What is the best way to detect them?

Project 1: Prevalence of Known HCV Infection Among AI/AN Mothers
   By Gus O’Malley

Project 2: HCV Screening During Prenatal Care
   By Leisha Nolen
Hepatitis C (HCV)

- Transmission by blood and body fluids
- Chronic infection
  - High risk of liver cirrhosis and cancer
  - Asymptomatic until severe liver damage has occurred
  - Estimated that 50% of people infected with HCV in the US are unaware they are infected
  - The leading cause of endstage liver disease and hepatocellular carcinoma in the US
Who’s Infected with HCV in the US?

National Health and Nutrition Examination Survey

• 1.3% antibody positive and 1% RNA positive between 2003-2010
  

• Estimate 3.5 million people living with HCV infection
  – High risk for generation born between 1945 and 1965

HCV in Pregnant Women

• Problems and opportunity
  – Risk of vertical transmission of HCV to the baby
  – Present a population easy to screen
  – Allows identification of both mothers and babies who could benefit from treatment
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Who’s Infected with HCV in the US?

National Health and Nutrition Examination Survey

- 1% positivity between 2003-2010
- Estimate 3.5 million people living with HCV infection
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Our Interest

• HCV in pregnant women
  – Risk of vertical transmission of HCV to the baby
  – Present a population easy to screen
  – Allows identification of both mothers and babies who could benefit from treatment

Our main questions:
  How many pregnant American Indian/Alaskan Native women are HCV positive?
  What is the best way to detect them?
Project 1: Reported HCV Infection Among AI/AN Mothers
HCV in American Indian and Alaska Native population

- Increased acute infections in AI/AN population over time

Source: CDC, National Notifiable Diseases Surveillance System (NNDSS)
Proportion of Reported HCV Infections Among AI/AN Mothers

AIMS

Among AI/AN Mothers:

1. Determine the number of reported cases of HCV and change over time

2. Examine the relationship between HCV and various risk factors

3. Analyze the number of reported cases of HCV in Alaska Native mothers.
Methods

- **Birth Certificate data**
  - Maintained by National Center for Health Statistics (NCHS)
  - Every baby born in the US
  - Information on mother’s demographics and medical record
    - Race
    - Age
    - Education
    - Tobacco use
    - Infections present during pregnancy
Reported cases of HCV in AI/AN mothers has steadily increased over the last five years.
The percentage of reported cases of HCV in AI/AN mothers is 2-3 times higher than non-AI/AN mothers.
The 4 other reportable infections are all associated with HCV.
Smoking is associated with HCV

Teenage mothers are less likely to be HCV positive than non-teens
AI/AN Mothers Initiating Prenatal Care vs. Reported HCV

- First trimester: 60%
- 2nd trimester: 30%
- 3rd trimester: 10%
- No prenatal care: 5%

- Precent HCV Positive
Limitations

- We only know who tested positive, not who was tested.

- Testing rates may vary:
  - By race - AI/AN may be more thoroughly screened
  - By year - testing may have increased over time

- HCV Rates may vary by geographic region
  - Reporting states increased from 36 states in 2011 vs. 48 states in 2015
  - New states were included in the NCHS database each year
Conclusions

- The percentage of AI/AN mothers with reported HCV in 2015 is 1.13%
- Reported HCV infection has increased 95% between 2011 and 2015
- HCV is correlated with co-infection with 4 other reportable diseases, smoking, and late presentation to prenatal care
- It sure would be nice if someone would study screening and testing during pregnancy…
Project 2: HCV Screening During Prenatal Care
Screening Recommendations for HCV Infection

- US Preventive Services Task Force
  - 1-time screening for adults born between 1945 and 1965
  - Screening for persons at high risk
Who is High Risk?

• Injection drug users past or present
• Received a transfusion before 1992
• Received long-term hemodialysis
• Born to an HCV-infected mother
• Time in jail or prisons
• Intranasal drug use
• Received an unregulated tattoo
HCV Screening in Pregnancy

• Previously little incentive
  – No treatment
  – No additional precautions
    • Poor evidence suggesting avoidance of internal fetal monitoring
    • Breast feeding is not contraindicated

Why do it?
Treatment options for Mom
Monitoring of the baby
Problems with Risk-based Screening

- Possibility of missed patients
  - Provider error
  - Dependence of patient reporting behavior
    - Stigmatization of risk behaviors
    - Actions in distant past
Risk Based Screening Quality?

• Study in high-risk inner city population USA
  – Based on physician recommended testing:
    • 4/419 (0.95%) HCV positive
  – Based on universal screening:
    • 7/220 (3.2%) HCV positive

• Study in Egypt
  – Using risk based system
    • 10% of patients would have been missed
Alaska Native Medical Center

• Obstetrics Department
  – Using standard risk-based screening

Are HCV infected people being missed?
CDC and ANMC

• CDC is assisting ANMC to evaluate the effect of universal screening
  – Collect data from 2013-mid 2016: Risk based screening
  – Compare to data from mid 2016-2020: Universal screening
    • Identify overall rate of positivity for the two periods
    • Identify epidemiologic risk factors for positivity
    • Evaluate cost of universal versus risk-based testing
Methods

• Identify women who delivered in ANMC hospital
  – Collect medical record numbers (MRNs)
• Review electronic medical records
  – Track HCV antibody testing in the 9 months before delivery date
• Evaluate relationship between HCV testing, positivity and risk factors
  – Any IV drug use
  – Smoking or alcohol abuse during pregnancy
  – Late presentation to prenatal care
Risk-based Screening Results

Preliminary data

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<thead>
<tr>
<th>Year</th>
<th>½ 2013</th>
<th>2014</th>
<th>2015</th>
<th>½ 2016</th>
<th>All Years</th>
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<tr>
<td>Total Deliveries</td>
<td>379</td>
<td>1096</td>
<td>1335</td>
<td>764</td>
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<td>Known Positives prior to Pregnancy</td>
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<td>5</td>
<td>4</td>
<td>6</td>
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<td>Total Women Tested During Pregnancy</td>
<td>23</td>
<td>113</td>
<td>246</td>
<td>156</td>
<td>538</td>
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<tr>
<td>% of Patients Tested</td>
<td>6%</td>
<td>10.3%</td>
<td>18.4%</td>
<td>20.4%</td>
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<tr>
<td>Total Positive Tests</td>
<td>2</td>
<td>11</td>
<td>17</td>
<td>6</td>
<td>36</td>
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<tr>
<td>% Tested Positive</td>
<td>8.6%</td>
<td>9.7%</td>
<td>6.9%</td>
<td>3.8%</td>
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</tr>
<tr>
<td>% of all Deliveries Positive</td>
<td>1.5%</td>
<td>1.5%</td>
<td>1.6%</td>
<td>1.5%</td>
<td><strong>1.5%</strong></td>
</tr>
</tbody>
</table>

Estimate of rate in 18-29 year-olds in Alaska is 0.36%

Future directions

• Data will be analyzed to identify risk factors
• Data will be collected over next 3 years to evaluate universal screening
• ANMC clinic will evaluate best testing strategy for their patients
Overarching Summary

• Between 1.2% and 1.5% of AI/AN women who delivered report HCV
• This percent is high compared to nationally published data showing that this population is likely at higher risk than the general US population
• Further research is needed to identify specific people at risk and evaluate best screening system
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Summary HCV Screening at ANMC

• In years prior to 2017 only patients considered at high risk were screened for HCV
• 15% of patients were tested for HCV using the risk based screening system
• 6.7% of patients tested were positive for HCV
• 1.5% of all women were positive for HCV
• 3 times the State’s estimated prevalence of HCV positivity