Antenatal Screening for Hepatitis C: Universal or Risk Factor Based?

VIRAL HEPATITIS PREVENTION BOARD MEETING
VIENNA AUSTRIA, JUNE 1 2017

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Why Antenatal HCV Screening?

- Pregnancy: Golden opportunity for HCV screening.
- Change in epidemiology of HCV with increase in HCV infection in women with childbearing age-U.S.
- Risk to the unborn child.
  - Without identification of HCV in pregnant women, many babies will be undiagnosed → future pool of HCV in adults.
  - Early intervention for treatment/education of women decrease horizontal transmission.
- Pregnancy can be associated with HCV related morbidities in mothers and infants.
- Potent treatment options for moms and potentially infants with DAA.
Change in HCV Epidemiology in the United States- Increase Among Young Population

- 2.9 fold increase in cases of acute HCV infection: 2010-2015.
- The highest rate and increase was among 20-29 years.
- Most new cases occur among young, white individuals residing in non-urban areas with history of IVDU (73%).
- Increase mostly in states in central Appalachia with increase in IVDU activity: Kentucky, Tennessee, Virginia, and West Virginia.
Incidence of acute hepatitis C by Age Group — United States, 2000–2014

Source: CDC, National Notifiable Diseases Surveillance System (NNDSS)

NNDSS and Quest laboratory Data

- Women in reproductive age constituted 40% of all women with HCV infection reported to the NNDSS from 2006 to 2014.
- Acute HCV infections doubled from 2006 to 2014.
- 0.73% of all pregnant women tested were HCV infected. Suggesting ~ 29,000 HCV infected moms annually giving birth.
- Large gap between number of reported infants with perinatal HCV infection vs. projected: 200 reported vs. 1700 projected → need for more testing among pregnant mothers and their infants.

Increase in Hepatitis C Virus Infection Among Women Giving Birth in the U.S. 2009-2014: 89% Increase From States reporting HCV status on the birth certificate

Pregnancy Complications and Neonatal Outcomes Associated with Maternal HCV Infection

- Association with PROM, gestational diabetes (if excess weight gain). As well as neonatal morbidities: NICU admissions, need for assisted ventilation, LBW, IUGR


- HCV infection in pregnancy is associated with IUGR and LBW in infants

Current Recommendations for Antenatal HCV Screening

- ACOG recommends routine screening of Hepatitis B, HIV, Syphilis, Gonorrhea, Chlamydia - not for HCV
- ACOG and CDC recommend HCV risk-factor based screening in pregnant women.
- CDC recommended universal HCV screening for individuals born: 1945-1965, but not pregnant women.
Availability of Risk Exposures/Behaviors Associated with Acute Hepatitis C — United States, 2014

Source: CDC, National Notifiable Diseases Surveillance System (NNDSS)

*Includes case reports indicating the presence of at least one of the following risks 2 weeks to 6 months prior to onset of acute, symptomatic hepatitis C: 1) using injection drugs; 2) having sexual contact with suspected/confirmed hepatitis C patient; 3) being a man who has sex with men; 4) having multiple sex partners concurrently; 5) having household contact with suspected/confirmed hepatitis C patient; 6) having had occupational exposure to blood; 7) being a hemodialysis patient; 8) having received a blood transfusion; 9) having sustained a percutaneous injury; and 10) having undergone surgery.
### HCV infected pregnant women vs HCV negative: MHMC 1993-2001-2008

<table>
<thead>
<tr>
<th></th>
<th>HCV positive N=126</th>
<th>HCV negative N=252</th>
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<tbody>
<tr>
<td>Caucasian*</td>
<td>86 (68.3%)</td>
<td>79 (31.3%)</td>
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<tr>
<td>Age*</td>
<td>30.0 +/- 6.5</td>
<td>25.5 +/- 5.9</td>
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<tr>
<td>Married</td>
<td>25/119 (21%)</td>
<td>69/252 (27.4%)</td>
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<tr>
<td>Parity*</td>
<td>2 (0, 3.25)</td>
<td>1 (0,2)</td>
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<tr>
<td>OB Questionnaire*</td>
<td>52/126 (41.3%)</td>
<td>67/252 (26.6%)</td>
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*p < 0.05

Non-Injection Drug Use Associated With HCV Transmission: Snorting of Drugs -

- Prospective cohort of 189 HCV positive pregnant women
  - 72% ever IVDU
  - 94% ever snorted
  - 87% Shared straws
  - 15% only snorted and shared straws

Noelle Fernandez; Craig V. Towers; Lynlee Wolfe; Sharing of Snorting Straws and Hepatitis C Virus Infection in Pregnant Women. Obstetrics & Gynecology. 128(2):234–237, AUG 2016, DOI: 10.1097/AOG.0000000000001507
HCV Knowledge among Pregnant Women and their Willingness to be Tested and Endorsement of Universal HCV Antenatal Screening

(June - September) 2011: Cross-sectional study, 302 pregnant women participated in the HCV survey

- 28.1% (84/302) had no knowledge of HCV transmission.
- 60% not aware of the risk of HCV MTCT.
- 94% not aware of the long term morbidities of HCV infection
- 60% were willing to be tested and 65% accepted universal testing.
- Strong correlation between willingness to be tested and acceptance of universal HCV test and HCV knowledge.

Hepatitis C Virus universal screening versus risk based selective screening during pregnancy

Prospective observational study in the immediate postpartum period: January-March 2013

Objective: Compare HCV risk-based selective screening to universal screening among postpartum women in our hospital.

- Low risk: women who were not tested by OB, based on risk assessment questionnaire.
- High risk: women who were HCV tested by OB based in the questionnaire.

419 women delivered: 39 were in the high risk group and 48% (183/380) were included in the low risk group.
Hepatitis C Virus (HCV) universal screening versus risk based selective screening during pregnancy

- Universal HCV testing resulted in the diagnosis of 3 additional HCV infected women
- 14% (25/183) of the “low-risk” women had documented HCV risk factors in their medical chart but did not trigger testing by OB.
- 43% (79/183) of the “low-risk” women had identified risks but not recorded and were not tested by OB.
- 24% (9/37) of the high risk women had no documented risk factors, but still tested by OB.
Hepatitis C Virus (HCV) universal screening versus risk based selective screening during pregnancy

- HCV prevalence in pregnant women was 4/419 (0.95%) based on the current practice of selective screening and increased to 7/220 (3.18%) with universal HCV screening.
- The screening questionnaire had a sensitivity of 0.85 (0.42-0.99) and specificity of 0.52 (0.45-0.58) in all women who had HCV antibody testing and questionnaire screening.
- Limitations:
  - Small sample size, inner city population.
  - Captured only 48% of the low risk women.
  - Lack of confirmation with PCR
Why Not Yet Universal Antenatal HCV Screening?

- Absence of HCV vaccine or immunotherapy.
- No approved therapy during pregnancy.
- Low vertical transmission rate of 3–5%.
- High rate of spontaneous HCV clearance in infants (25–50%).
- Lack of approved treatment for young infants.
- Delayed morbidity in HCV infected children and adults.
- Prohibitive cost....
Universal Antenatal HCV Screening: Cost-Effectiveness

- Compared with no HCV screening: cost of screening, treatment, and cesarean delivery → was not cost effective


- 10 years study in London center: 2003-2013, universal HCV screening in pregnancy: 136/35355 HCV+ women: 19 women were treated → screening and treatment was cost effective

What is needed?

- Promote HCV awareness among patients and providers.
- Advocate for universal antenatal HCV screening, specially in countries/selected areas with either high HCV prevalence or high rates of HCV associated social determinants.
- Collaborative efforts to decrease cost of testing in pregnancy and HCV therapy.
- Clinical trials for treatment during or immediately after pregnancy.