

Medical Writers' Circle

April • 2006

a series of articles
written by medical
professionals about
the management
and treatment of
hepatitis C

Steven K. Herrine, MD

Thomas Jefferson
University Hospital,
Philadelphia, PA

Mother-to-Child Transmission of HCV

Hepatitis C virus (HCV) infection is common in the US, and is estimated to affect some 3 million persons. Transmission of the virus is parenteral, that is, transmitted by blood. Statistically, the most common risk factor for HCV infection is current or remote drug use, but this mode of infection accounts for only half of known cases. It is clear that HCV can be transmitted via other exchanges of bodily fluids, including sexual contact and, the focus of this report, vertical (mother to infant) transmission.

Estimates of the prevalence of HCV infection in pregnant women vary widely among studies, ranging from 0.1% to 4.5%. Because the identified risk factors for HCV seropositivity in this group are identical to those of the general population, it is reasonable to conclude that the true seroprevalence in pregnant women is quite similar to that of the general public, or about 1.8%.

The rate of vertical transmission of HCV has also been

estimated with widely varying results. The difficulty of obtaining accurate measurement of vertical transmission risk includes persistence of maternal antibodies in the newborn, failure to identify all infected mothers and loss of infants born to HCV(+) mothers to follow-up. This being said, the best estimate of the prevalence of vertical transmission of HCV is in the range of 5%. Although HCV/ HIV co-infection appears to increase the risk of vertical transmission, other risk factors have not been consistently identified. Even the identification of the timing of such transmission between intrauterine versus intrapartum exposure has not been satisfactorily delineated.

Below is a summary of some of the largest current studies of vertical transmission of HCV:

A 1997 Italian study reported on a sample of 245 infants, with a vertical transmission rate of 3.7%, but higher figures in HCV/ HIV co-infection (15%). This group also reported a higher risk in vaginal vs. caesarian

delivery. As will be seen, later data from larger prospective trials refutes the potential benefit of C-section.¹

A 1998 Italian study of 75 HCV infected pregnant women revealed a 4.4% vertical transmission rate in HCV-only infection and provided further evidence of increased vertical transmission (17%) in HCV/ HIV co-infected mothers.²

A landmark study which provided the most accurate information regarding vertical transmission was published in *Hepatology* in 2000. In this study, 15,250 consecutive pregnant women were screened for HCV, 370 of whom had evidence of viral infection. Overall vertical transmission rate was 5.1% and was seen exclusively in mothers who had detectable viremia by PCR. Genotype, viral load, vaginal vs. cesarean delivery, breast feeding or HIV co-infection were not associated with transmission.³

A 2005 cohort study conducted by the Center for Disease Control and Prevention (CDC) found that membrane rupture and internal fetal monitoring were associated

with higher risk of HCV transmission. Although the authors of this study caution against internal fetal monitoring and prolonged labor following rupture of membranes, they stop short of making any change in C-section recommendations.⁴

A very large European prospective cooperative study from 2005 showed an overall transmission rate of 6.7%, with only a modest and non-statistically significant increase in HCV/HIV coinfecting mothers. The authors suggest that the decreased excessive risk in coinfection is due to physician awareness and increasingly effective anti-retroviral therapy. This trial confirmed the previously described association between prolonged rupture of membranes and viral transmission. Cesarean section and breast feeding were not associated with higher risk of vertical transmission. A surprising finding was that HCV vertical transmission was more likely in girls than boys. The authors offer some speculation as to why this difference occurred, but the reasons remain unclear.⁵

A carefully designed 2006 study from the European Paediatric Hepatitis C Virus Network suggests that vertical transmission takes place in utero at a higher than previously thought rate, perhaps up to half of cases. The results suggest that post-partum transmission is quite uncommon. Thus, as in other studies, breast feeding is

recommended. The investigators suggest that once when anti-HCV therapy is developed that can be given safely in pregnancy, the treatment should start early to decrease the risk of in utero transmission.⁶

Based upon these and other studies, the following guidelines and recommendations can be made:

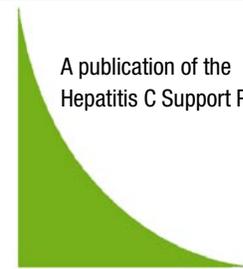
- The presence of HCV infection does not appear to result in a higher risk pregnancy or a higher incidence of poor obstetric outcome.
- HCV(+) mothers can transmit infection to their babies. The most accurate estimate of such an event is in the range of 5%. This risk is probably increased in the setting of HCV-HIV coinfection, although with newer HIV therapies, this risk has been diminished.
- It is not clear that high viral load or viral genotype increases the risk of transmission.
- Testing for the presence of HCV in infants born to HCV(+) mothers should not begin until at least 18 months following delivery. The natural history of HCV infected infants is poorly understood at this time.
- Prophylactic caesarian section is not recommended in HCV infected or HCV/HIV coinfecting mothers. In cases of labor with prolonged rupture of membranes, the increased risk of HCV transmission may affect the decision for operative delivery.

• Breast-feeding presents a low or negligible risk of transmission, and, given the well-documented benefits, should be routinely recommended.

References:

1. Tovo PA, Palomba E, Ferraris G, Principi N, Ruga E, Dallacasa P, Maccabruni A. Increased risk of maternal-infant hepatitis C virus transmission for women coinfecting with human immunodeficiency virus type 1. *Clin Infect Dis.* 25(5):1121-4, 1997 Nov.
2. Mazza C, Ravaggi A, Rodella A, Padula D, Duse M, Lomini M, Puoti M, Rossini A, Cariani E. Prospective study of mother-to-infant transmission of hepatitis C virus (HCV) infection. *Study Group for Vertical Transmission. J Med Virol.* 54(1):12-9, 1998 Jan.
3. Conte D, Fraquelli M, Prati D, Colucci A, Minola E. Prevalence and clinical course of chronic hepatitis C virus (HCV) infection and rate of HCV vertical transmission in a cohort of 15,250 pregnant women. *Hepatology.* 31(3):751-5, 2000 Mar.
4. Mast EE, Hwang LY, Seto DS, Nolte FS, Nainan OV, Wurtzel H, Alter MJ. Risk factors for perinatal transmission of hepatitis C virus (HCV) and the natural history of HCV infection acquired in infancy. *J Infect Dis.* 2005 Dec 1;192(11):1880-9.
5. European Paediatric Hepatitis C Virus Network. A significant sex – but not elective cesarean section – effect on mother-to-child transmission of hepatitis C virus infection. *J Infect Dis.* 2005 Dec 1;192(11):1872-9.
6. Mok J, Pembrey L, Tovo PA, Newell ML; European Paediatric

Hepatitis C Virus Network. When does mother to child transmission of hepatitis C virus occur? *Arch Dis Child Fetal Neonatal Ed.* 2005 Mar;90(2):F156-60.



A publication of the
Hepatitis C Support Project

Medical Writers' Circle

The Mission of the Hepatitis C Support Project is to offer support to those who are affected by the hepatitis C Virus (HCV), hepatitis B Virus (HBV) and HCV coinfections.

Support is provided broadly, through information and education, as well as access to support groups. The Project seeks to serve the HCV community as well as the general public.

**Executive Director
Editor-in-Chief,
HCSP Publications**
Alan Franciscus

**Managing Editor /
Webmaster**
C.D. Mazoff, PhD

This information is provided by the Hepatitis C Support Project • a nonprofit organization for HCV education, support and advocacy • © 2006 Hepatitis C Support Project • Reprint permission is granted and encouraged with credit to the Hepatitis C Support Project.

Visit our web site at
www.hcvadvocate.org