

Maternal immunisation and neonatal infection of hepatitis A or B virus

I read with interest the review by Angela M Bengtson and colleagues¹ on maternal immunisation to improve the health of HIV-exposed infants. However, I have some concerns regarding maternal immunisation against hepatitis A virus (HAV) and hepatitis B virus (HBV) to prevent neonatal infection.

First, the stated epidemiology of hepatitis A and B in pregnant women is ambiguous. The incidence of hepatitis A in this Review is not the global data, and one cited article² clearly stated that less than 0.1% of pregnant women might suffer from hepatitis A. The higher prevalence of HBV infection in pregnant women is the consequence of infection that occurred before pregnancy rather than during pregnancy.

Second, the authors suggested immunisation of pregnant women to prevent primary HAV or HBV infection in women and subsequent mother-to-infant transmission. However, no study has shown that HIV-infected women have increased risk for HAV or HBV infection during pregnancy. As the authors mentioned, mother-to-infant transmission of HAV is rare. Maternal immunisation should have no benefit in preventing hepatitis A in children, who should receive the hepatitis A vaccine aged 1 year. For prevention of hepatitis B, universal vaccination of all infants has been implemented in 186 countries since 2016.³ Infants of HBV-infected mothers should receive both hepatitis B immunoglobulin and the hepatitis B vaccine within 12 h of birth. Thus, to prevent mother-to-infant transmission of HBV, maternal prenatal screening for HBV, rather than maternal immunisation, is essential.

Third, the statement that “60% of women with acute HBV transmit

the virus to their fetus” is misleading in two aspects. One is that 60% is a historical figure from a time when hepatitis B immunoglobulin and the hepatitis B vaccine were unavailable. With the availability of hepatitis B immunoglobulin and hepatitis B vaccine, the overall transmission in infants of HBV-infected mothers is 1–3%.^{4,5} The protective efficacy is similar in infants of mothers co-infected with HIV and HBV.⁶ The other is that “transmit the virus to their fetus” means in-utero transmission, which is incorrect. Mother-to-infant transmission of HBV dominantly occurs during and after the birth process, and spread in utero is very rare.⁵

In summary, the evidence to improve the health of HIV-exposed infants by maternal immunisation against hepatitis A or B is lacking. No guideline recommends maternal immunisation to prevent neonatal infection of hepatitis A and B in any country.

I declare no competing interests.

Yi-Hua Zhou
zgr03summer@126.com

Department of Infectious Diseases and Department of Laboratory Medicine, Nanjing Drum Tower Hospital and Jiangsu Key Laboratory for Molecular Medicine, Nanjing University Medical School, Nanjing, China

- 1 Bengtson AM, Sanfilippo AM, Hughes BL, Savitz DA. Maternal immunisation to improve the health of HIV-exposed infants. *Lancet Infect Dis* 2018; published online Dec 7. [https://doi.org/10.1016/S1473-3099\(18\)30545-0](https://doi.org/10.1016/S1473-3099(18)30545-0)
- 2 Zhao Y, Jin H, Zhang X, Wang B, Liu P. Viral hepatitis vaccination during pregnancy. *Human Vaccin Immunother* 2016; **12**: 894–902.
- 3 Seto WK, Lo YR, Pawlotsky JM, Yuen MF. Chronic hepatitis B virus infection. *Lancet* 2018; **392**: 2313–24.
- 4 Schillie S, Walker T, Veselsky S, et al. Outcomes of infants born to women infected with hepatitis B. *Pediatrics* 2015; **135**: e1141–47.
- 5 Liu J, Xu B, Chen T, et al. Presence of hepatitis B virus markers in umbilical cord blood: Exposure to or infection with the virus? *Dig Liver Dis* 2018; published online Nov 20. DOI:10.1016/j.dld.2018.11.003.
- 6 Khamduang W, Gaudy-Graffin C, Ngo-Giang-Huong N, et al. Analysis of residual perinatal transmission of hepatitis B virus (HBV) and of genetic variants in human immunodeficiency virus and HBV co-infected women and their offspring. *J Clin Virol* 2013; **58**: 415–21.

Authors' reply

We thank Yi-Hua Zhou for their comments on our Review on maternal immunisation to improve the health of HIV-exposed infants.¹ We agree that infant immunisation against hepatitis A and hepatitis B is likely to remain the primary strategy to reduce the global burden of hepatitis. However, pregnant women travelling to endemic areas, those who inject drugs, or (for hepatitis B) those who have multiple sex partners might be at increased risk of contracting hepatitis A or B.^{2,3} For these reasons, we support the Advisory Committee on Immunization Practices (ACIP) recommendations that hepatitis A and B vaccination be considered in women at high risk for either infection, if the benefits outweigh potential risks.^{2,3}

As noted in our Review and by Zhou, the global prevalence of hepatitis A during pregnancy is low and mother-to-child transmission is rare.¹ However, hepatitis A can lead to substantial morbidity in infected adults and to complications during pregnancy that might increase the risk of preterm birth.^{2,4} More data are needed to determine whether hepatitis A vaccination is a safe and effective strategy to prevent morbidity during pregnancy and potentially improve pregnancy outcomes.

Hepatitis B remains an important public health issue, particularly in areas of high HIV burden. Approximately 10% of HIV-infected adults are co-infected with hepatitis B.³ HIV-infected adults are considered by ACIP to be at high risk for contracting hepatitis B because of the shared routes of transmission for both viruses.³ A higher prevalence of hepatitis B has been found among pregnant women with HIV than among pregnant women without HIV.⁵ As Zhou points out, administering hepatitis B immunoglobulin and hepatitis B vaccine within 12 h after birth is effective at preventing mother-to-child transmission.