

# Teens susceptible to hepatitis B infection despite vaccination as infants

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New research reveals that a significant number of adolescents lose their protection from hepatitis B virus (HBV) infection, despite having received a complete vaccination series as infants. Results in the January 2013 issue of *Hepatology*, a journal published by Wiley on behalf of the American Association for the Study of Liver Diseases, suggest teens with high-risk mothers (those positive for HBeAg) and teens whose immune system fails to remember a previous viral exposure (immunological memory) are behind HBV reinfection.

Infection with HBV is a major global health concern even with the success of universal vaccination against the virus in infants. The [World Health Organization](#) (WHO) estimates two billion individuals worldwide have HBV infection, with 360 million chronic carriers of the [hepatitis B surface antigen](#) (HBsAg). In the U.S., the [Centers for Disease Control and Prevention](#) (CDC) state that up to 1.4 million Americans are living with chronic HBV.

In Taiwan, where the present study was conducted, mother-to-child transmission (vertical transmission) is responsible for much of the HBV cases in that country. In fact, Taiwan has long been an endemic area with an HBV infection rate of 95% and HBsAg carrier rate that is found in up to 20% of the general population. To combat this major health burden, Taiwan launched the world's first universal [vaccination program](#) in 1984, vaccinating newborns of infectious mothers then expanding to all newborns in 1986.

"Chronic HBV is a major health burden that leads to cirrhosis, [liver cancer](#) (hepatocellular carcinoma) and [liver failure](#), shortening lives and placing a huge economic drain on society," said lead author, Dr. Li-Yu Wang from Mackay Medical College in New Taipei City, Taiwan.

"While infantile HBV vaccination is highly effective, it is not 100% and our study examines the long-term success of the HBV vaccine in a high-risk population."

For the present study, 8733 high school students born between July 1987 and July 1991 provided vaccination records and were assessed for presence of HBsAg and antibodies to HBsAg (anti-HBs). The mean age of participants was 16 years and 53% of the group was male. All participants attended school in Hualien County located in east Taiwan.

Findings indicate that HBsAg and anti-HBs positive rates were 2% and 48%, respectively. For students who received the HBV immune globulin (HBIG) and vaccine as infants, 15% were positive for HBsAg—a rate that was significantly higher in students whose mothers were positive for HBeAg and who received HBIG off schedule. Researchers found a significantly negative association between HB vaccination dose and a positive rate of HBsAg among students who did not receive HBIG.

Reporting on previous research the team notes that the vaccine program reduced HBV infection and carrier rates of children in Taiwan. Prior studies also reported a decline in severe hepatitis in infants and liver cancer in children as a result of the vaccine program. Dr. Wang concludes, "Certainly the HBV [vaccine](#) program was a great success in Taiwan. For adolescents who lose protection, a HBV vaccination booster at age 15 or older should be considered, particularly in those born to HBsAg positive mothers or who had a high-risk of HBV exposure. Those born to high-risk mothers should first be screened for HBsAg."

Researchers further suggest a routine anti-HBV treatment during

pregnancy may help to further reduce infant exposure to the virus. However, they stress that the safety and efficacy of this therapy plan would need to be proven in large-scale studies before standard use to combat HBV.

**More information:** "Chronic Hepatitis B Infection in Adolescents Who Had Received Primary Infantile Vaccination." Tzu-Wei Wu, Hans Hsienhong Lin, Li-Yu Wang. *Hepatology*; ([DOI: 10.1002/hep.25988](https://doi.org/10.1002/hep.25988)); Print Issue Date: January, 2013.

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