
Readers' Forum

Hepatitis B Virus Infection

Q. *I wish to seek a few clarification in relation to Hepatitis B virus infection: (i) It is claimed that Hepatitis B Virus (HBV) is transmitted via contact sports, minor abrasions, insects, mosquitoes and bedbug bites. If so, what are the chances?; (ii) Is any data available regarding HBsAg positivity in Indian children below 5 yrs and from 5-10 yrs of age?; and (iii) is there any change in schedule for HBV vaccination for babies of mothers completely vaccinated before?*

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A. Dr. Desai has raised several important issues about the epidemiology, transmission and prevention of HBV infection in children. We will address them one by one.

Horizontal transmission (*i.e.*, from person-to-person) of HBV in the school setting, and even more frequently within families, is an important mode of transmission in developing countries in Africa and Asia which have a moderate to high prevalence of infection. The exact mode(s) of transmission of HBV in these settings is not completely understood but they include contamination of open skin surfaces, including minor abrasions, with blood or infected body fluids from a HBV carrier. Similarly, HBV may be transmitted by contact sport if a person sustains an injury with a break in the skin surface which is then contaminated from blood or infected body fluid from another player. Therefore protection by HB immunization, even in older children who

have not been vaccinated in infancy, is a good idea in countries (like India) where horizontal transmission via these modes is common.

HBV and hepatitis B surface antigen (HBsAg) are present in relatively high concentration in the blood of persons with chronic infection, HBsAg being present in much higher concentrations than HBV. Therefore, hematophagous insects including bedbugs and mosquitoes will have HBV and HBsAg in the stomach blood. Indeed, HBsAg has been detected in wild caught mosquitoes and from bedbugs. When the same insects bite another person they may inject saliva into the skin. Malaria sporozoites, and arthropod borne viruses such as dengue virus and Japanese encephalitis virus are found in the saliva due to replication cycles virus are found in the saliva due to replication cycles within the insect. On the other hand, HBV does not infect or replicate in insects and there is no virus in their saliva. Hence, virus transmission via an insect bite is not likely. If, on the other hand, an insect which lands on the skin after having fed on an infected carrier is smashed by slapping it and the site is then scratched, inoculation of infected blood into the skin resulting in infection is possible. The distribution of HBV is disproportionately low when compared to insect bites. Hence, this is not a mode of transmission, for all practical purposes.

The prevalence of HBsAg positivity in children less than 15 years in various parts of India has ranged from 1.3%-12.7% in different studies(1). In these studies, the prevalence in children 1-5 years and those 5-10 years were not significantly different. In India, a sizeable proportion of these children

are infected horizontally due to continued exposure. Therefore, all children, irrespective of their age would benefit from HB vaccination.

The antibody levels, following vaccination, in older infants and children are higher than in infants who are immunized at birth. This is likely to be due to the presence of passively acquired maternal antibody in young infants. However, the proportion of children who respond (*i.e.*, seroconversion rate) is similar in both age groups. Immunization at birth has the additional advantage of preventing vertical transmission from mother to infant. Since vertically acquired infection is an important mode of transmission of HBV and results in high rates of chronic carriage, it is more beneficial to start immunization at

birth even though the antibody levels may be lower than when immunization is delayed. We, therefore, do not recommend a change in schedule for HBV vaccination of babies of mothers completely vaccinated before.

REFERENCE

1. Kant L, Arora NK. Transmission of hepatitis B virus in children: Indian scenario. *In: Hepatitis B in India: Problems and Prevention.* Eds. Sarin SK, Singhal AK. New Delhi, CBS Publishers and Distributors, 1996; pp 21-32.

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