Hepatitis B revaccination of neonates with inadequate response after primovaccination

Passive–active immunization with hepatitis B immunoglobulin and hepatitis B vaccine has proved to be highly effective in preventing perinatal transmission of hepatitis B infection. An anti-HBs antibody level > 10 IU l⁻¹ is considered to provide protection against hepatitis B infection. Response to the vaccine depends on host factors like age, HLA type and the presence of diseases affecting immunity. The immune response (expressed in IU l⁻¹) is higher in neonates than in adults. Even so, inadequate responses to hepatitis B vaccine do occur. In adults additional vaccination in non- and low-responders has been reported to yield responses of 27–100% [8–10]. The question of how to manage non-responders also arises for young children. As far as we know no data are available on additional vaccination in infants. Therefore, we report the results of revaccination offered to nine healthy neonates who developed <10 IU l⁻¹ anti-HBs after primovaccination and a booster dose.

Over the past 9 years, 705 healthy newborns from HBsAg positive mothers received HBIG (120–300 IU, CLB, Amsterdam, The Netherlands) at birth and were vaccinated within the first year with plasma or recombinant DNA vaccine according to several schemes including at least two initial doses and a booster dose. Vaccine was always stored at 4°C and given into the quadriceps muscle by physicians. HBsAg and anti-HBs were measured (Austria II, Ausab, Abbott Laboratories) 1 month after completion of the immunization schedule. Nine infants with a negative test for HBsAg and an anti-HBs level below 10 IU l⁻¹ received three to four additional doses of plasma-derived (10 µg) or recombinant DNA (20 µg) vaccine in their second year of life.

After revaccination all infants showed an anti-HBs response > 10 IU l⁻¹; seven children (78%) developed > 50 IU l⁻¹ anti-HBs and four of them > 100 IU l⁻¹. The three non-responders after primovaccination (anti-HBs 0 IU l⁻¹) had a response in the lower range (Figure 1). No hepatitis B infections were observed among these nine children during follow-up (median 51, range 33–92 months). Twelve months after completion of revaccination eight of the nine infants (89%) still had > 10 IU l⁻¹ anti-HBs.

Our data show that additional vaccination of infants who had a non-detectable or a weak response after primovaccination and no signs of hepatitis B infection can yield responses with a high likelihood of protection against hepatitis B infection. From an epidemiological viewpoint this result is important since many of these children remain at risk for hepatitis B infection for years due to family contacts.

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References


Figure 1 - Anti-HBs response after hepatitis B revaccination in infants, who were low-responder (n = 6) or non-responder (n = 3) after primovaccination and a booster dose. The non-responders are indicated by arrows

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