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Evaluation of immune response to hepatitis B vaccine in Egyptian children

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Background: Hepatitis B is considered a major health problem in Egypt and worldwide that can lead to chronic hepatitis, hepatic cirrhosis, hepatocellular carcinoma and liver failure. Approximately 350 million people worldwide had chronic HBV infection and that 1 million persons die each year from it. A study in Egypt found that the prevalence rate of Hepatitis B was moderately high (10.1%); higher in Upper Egypt than Lower Egypt in young adults' males than females and in 1992, WHO recommended that all countries integrate hepatitis B vaccine (recombinant DNA-based vaccine targeting the HBV major surface protein) into national immunization programs.

Materials & Methods: The present study was conducted on 182 children (110 males and 72 females categorized into eight age groups from 2-10 y/o). Children had received HBV vaccine at 2, 4 and 6 months of age according to the vaccine schedule of the Egypt, they were subjected to detailed clinical history and full clinical examination to exclude HBV infection, those suffering from chronic illness on longterm steroid treatment or children of mothers infected with hepatitis B during pregnancy were excluded. We evaluated the long-term efficacy of infant hepatitis B vaccination program in preventing hepatitis B virus infection and to assess its impact on the incidence of hepatitis B in children. Serum samples from each participant were tested for the quantitative determination of anti-HBs antibody using enzyme linked immunosorbent assay (ELISA) as well as qualitative ELISA testing for HBsAg and HbcAb. The study showed that the efficacy of hepatitis B vaccine as evidenced by presence of protective levels of HbsAb is 88.5%. HBsAg was not detected in any participant. The protective rate for the 2-6 years age groups was 100% while the protective rate for the 7-10 years age group was less.

Results: We concluded that hepatitis B vaccine efficacy is high in an immunocompetent population and that a booster vaccine dose is not necessary before 6 years of age. Gender difference was not found.

Conclusion: Hepatitis B vaccination program in Egyptian children appears to be initially effective in the first few years (2-6 years) following vaccination as evidenced by high levels of anti-HBs antibody together with absence of serological evidence of infection or carrier states. The decrease in antibody levels in older children (7-10 years), although expected is not alarming since exposure to infection would most likely trigger an anamnestic response that would lead to a spike in protective antibody levels. Moreover, the majority of older children retained a level of antibody which although lower was still in the protective range.

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