In 1986, a program to prevent mother-to-infant transmission of hepatitis B virus (HBV) was initiated in Japan. Since that time, expecting mothers have been routinely tested for hepatitis B surface antigen (HBsAg). When a mother is found to be HBsAg-positive, she is also tested for hepatitis B e antigen (HBeAg). If a mother tests positive for both HBsAg and HBeAg, the newborn infant is administered the hepatitis B vaccine and immunoglobulin at the public’s expense. The rate of HBsAg testing of expecting mothers was calculated to be 92-96%, as determined by comparison of the number of expecting mothers tested for HBsAg and the number of births during the following year (1). Moreover, 97-98% of newborn infants with HBeAg-positive mothers were administered the hepatitis B vaccine together with immunoglobulin (1). This mother-to-infant HBV transmission prevention program was expanded in March of 1995 to include not only newborn infants with HBeAg-positive mothers, but also infants with HBeAg-negative mothers.

Since 1995, HBsAg-positivity rate of first-time blood donors in Tokyo, Ibaraki, Tochigi, Kanagawa, and Fukuoka Prefectures has been investigated. Because first-time blood donors are unaffected by prior notification of previous screening test results, the positivity rate of first-time blood donors is thought to reflect the positivity rate of the community in general. To evaluate the effectiveness of the mother-to-infant HBV transmission prevention program, we compared the HBsAg positivity rate of 16-year-old first-time blood donors before and after 2003, because all 16-year-old blood donors in these areas were born in the same year, 1986.

The HBsAg positivity rate of 16-year-old first-time blood donors was found to decline yearly starting in 1995, and finally reached zero in 2003 (Fig. 1). In 2004, the positivity rate increased, but it was confirmed that all HBsAg-positive persons identified in that year had been infected via a horizontal transmission route. Because the HBsAg-positivity rate in 2005 returned to zero, no HBV carrier was identified among 16-year-old first-time blood donors for the 3 years from 2003 to 2005. However, one HBV carrier was confirmed in 2006. Investigation revealed that this case was due to a failure of immunoprophylaxis.

The effectiveness of this program to prevent mother-to-infant transmission of HBV was confirmed by investigation of the HBsAg-positivity rate of 16-year-old first-time blood donors. It is expected that the continuity of this prevention program will substantially reduce the number of HBV carriers in Japan.

The HBsAg-positivity rate of 16-year-old first-time blood donors was found to decline yearly after the onset of this study in 1995. This decline may be attributed to the following factors: (i) clinical immunoprophylaxis trials using hepatitis B vaccine and immunoglobulin had been carried out prior to the initiation of the national mother-to-infant HBV transmission prevention program, and (ii) the number of infants with HBeAg-positive mothers decreased due to late marriage.

REFERENCE