

## Increasing HBV reservoir by post-transfusion HBV infection in India

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Accepted May 17, 1986

**Post-transfusion hepatitis due to hepatitis B virus was studied in patients of portal hypertension subjected to surgery during which they received 4.5 units of blood on average. These patients were followed up for a period of 9 to 88 months. Evidence of HBV infection in transfused patients was significantly higher in patients ( $P < 0.001$ ). HBV carrier rate depended upon the number and source of units of blood transfused. Carrier rate was maximum (16.5%) when more than 10 units of blood transfusion from commercial source was given. NANB hepatitis virus was also implicated in few cases. Third generation screening test for HBsAg is suggested to prevent HBV infection in patients requiring blood transfusion.**

Hepatitis B virus (HBV) infection can either cause serious illness like fulminant hepatitis with very high mortality or progress to chronic complications like cirrhosis of liver<sup>1</sup> and hepatoma<sup>2</sup>. The infection has a global distribution. As man is the only reservoir of infection, chronic carriers of this virus serve as the main source of infection.

Among precautionary measures, isolation, sterilization as also active and passive immunisation have been suggested to reduce the spread of infection. However, the use of HBsAg-free blood for transfusion continues to be the most important factor in the prevention of this infection<sup>3-5</sup>. Use of blood from only voluntary donors (and not professional

donors) and testing of blood for HBsAg by the third generation techniques, are most essential for this purpose.

In the developing countries, blood bank facilities are inadequate. Even university hospitals in India which are rated high in their development suffer from scarcity of voluntary donors and due to poor facilities for testing the HBV markers. Private blood banks collect blood from commercial donors and either do not test the samples at all or else test them by insensitive techniques. In emergency situations like massive gastrointestinal bleeding, large amount of blood is required. Due to scarcity of blood, one has little choice between not transfusing blood to even serious patients and using blood from

private blood banks. This situation obviously increases the risk of post-transfusion HBV infection.

To study the magnitude of this risk, we undertook a retrospective study of post-transfusion hepatitis (PTH) due to HBV at the All India Institute of Medical Sciences (AIIMS) Hospital. Data of 65 patients, who had received multiple blood transfusions and were operated for portal hypertension were analysed. The patients were followed up from 9 to 88 months, after surgery, at least once in six months. All the patients were tested for HBsAg before surgery by counter immunoelectrophoresis (CIEP). Sera from all the patients were tested for HBV markers after surgery either during one of the follow ups in six months after surgery or when a patient developed signs and symptoms of liver disease. HBsAg was tested by the micro ELISA test<sup>6</sup>. Anti-HBs, HBeAg, Anti-HBe and IgM anti-HBc were tested by ELISA technique using commercial diagnostic kits (Abbott Lab., USA).

All the patients received, on an average 4.5 units of blood during surgery, from the AIIMS blood bank. Twelve patients had received  $3.4 \pm 1.2$  units of blood from AIIMS blood bank before surgery, while 45 were transfused  $6.7 \pm 6.4$  units of mixed blood (from AIIMS and commercial blood banks). Eight patients had no history of transfusion prior to surgery. Eleven of the 65 patients required additional  $3 \pm 2$  units of blood after surgery, which was provided by the AIIMS blood bank.

All the patients were negative for HBsAg just before surgery. Only two

patients had clinically overt hepatitis three months after surgery. Eight patients were positive for HBsAg, but their liver function tests were normal; these patients were asymptomatic. All the eight subjects were negative for IgM anti-HBc, HBeAg and anti-HBe. Anti-HBs was detected in 25 out of 65, four of which were also positive for HBsAg. Eighteen of the remaining 36 patients, negative for HBV markers, had mild elevation of transaminases on one occasion. Liver biopsy done in one of the patient who also had symptoms suggestive of chronic liver disease, showed CAH with cirrhosis.

This preliminary study leads to the following conclusions :

(i) Post-transfusion spread of HBV infection is quite high. HBsAg carrier rate was 12.3 per cent in these patients compared to 3.6 per cent in general population<sup>7</sup>, the difference being statistically significant ( $P < 0.001$ ). Anti-HBs positivity in this group was 38.4 per cent compared to around 16-20 per cent in general population; (ii) HBsAg carrier rate was higher when blood was transfused from commercial donors. Carrier rate was 6.6 per cent when less than 5 units of HBsAg negative blood was transfused exclusively from voluntary donors, 11.2 per cent when patients received 6-10 units of mixed blood and 16.5 per cent when more than 10 units of mixed blood was transfused; and (iii) a few cases of post-transfusion hepatitis may be attributed to NANB infection.

We suggest that in India and other developing countries, blood bank services should get priority attention and firm supervision for HBsAg screening by third generation tests. Further the use of blood

from only voluntary donors needs to be encouraged. These are the only two effective ways that can help in reducing the post-transfusion HBV infection and HBsAg carriers in our country.

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