Post Transfusion Hepatitis

Pages with reference to book, From 52 To 55

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Viral hepatitis is still the most serious post-transfusion complication.

The diagnosis of acute anicteric post transfusion hepatitis is made between 14 to 180 days after transfusion with two consecutive elevations (at least 5 days apart) of the recipient's SGPT levels in the absence of other possible causative factors. Icteric Hepatitis is diagnosed if the recipient's total serum bilirubin level exceeds 2.0 mg/dl. The serological tests for the etiologic diagnosis of type B hepatitis include, hepatitis B surface antigen (HBsAg), hepatitis B surface antibody (anti HBs), and hepatitis B core antibody (anti HBc). Hepatitis A antibody is diagnostic of type A hepatitis. The absence of serologic markers indicative of type A and B infection and the presence of abnormal liver enzymes, are taken as presumptive evidence of "non A non B" viral hepatitis. The association of HBsAg with type B hepatitis initiated studies to determine if screening of donors with this antigen would reduce the prevalence of post-transfusion hepatitis. This hypothesis was confirmed by Gocke and coworkers (1970) who showed that 74% of recipients transfused with blood containing HBsAg developed hepatitis same was confirmed by Holland et al. (1973).

As a result of antigen screening of donor blood for type B hepatitis, it was observed that 10-13% post transfusion hepatitis in United States is due to type B infection (Aach et al., 1978; Seeff et al., 1975 Prince et al., 1974). Mortality after post transfusion hepatitis has also been considerably reduced (Goldfield et al., 1975). Moreover, it was observed that type B hepatitis is more frequent after blood transfusion from a commercial donor, as compared to a volunteer donor. Exclusion of HBsAg positive and commercial donors, reduces the chances of post transfusion hepatitis by 25% and 70% respectively. Similar observations have been reported by Seef et al. (1975) and Taswell (1972). A decline in type B post transfusion hepatitis is also due to detection and exclusion of hepatitis B virus carriers.

Despite universal screening of blood donors a marked reduction in the overall prevalence of type B post transfusion hepatitis, has not been achieved. Six prospective studies done after the screening of HBsAg became mandatory, showed that type B post transfusion hepatitis occurred in 8 - 45% of the blood recipients as against 6 - 38% that occurred in 4 prospective studies conducted prior to antigen testing. One hypothesis for this is that residual cases were type B hepatitis transmitted by HBV carriers not detected even by the most sensitive tests, thus more sensitive and additional tests were introduced to detect different components of type B virus (e.g. DNA polymerase and anti HCc) with these tests few undetermined cases of type B hepatitis have been determined (Hoofnagle et al., 1977).

Another hypothesis related to type A infection was soon ruled Out on the basis that carrier state apparently does not exist in type A infection (Krugman et al., 1962). Secondly HAV circulates in low titers during acute phase (Hollinger et al., 1975) and lastly most of the adults who are likely to be blood recipients, have already had hepatitis A and so are immune to reinfection (Szmuness et al., 1976).

Blood with type B hepatitis was analysed for cytomegalo virus and Epstein-Barr Virus, and it was found that less than 5% of the total have associated cytomegalovirus, but not Epstein-Barr Virus (Aach et al., 1978; Prince et al., 1974; Feinstone et al., 1975).

These observations have led to a fourth and currently accepted hypothesis i.e., there is another Virus or Viruses (Shimizu et al., 1979) currently said as "non-A non-B" or type C, that now accounts for vast majority of all post transfusion hepatitis. The incubation period for this type of virus varies from 2-16 weeks, average 7-8 weeks; which is intermediate between that 4 week mean incubation period of hepatitis A, and 12-14 week mean incubation period of hepatitis B. Two basic patterns of SGPT have been observed (Aachet al., 1978; Seeff etal., 1975; Shirachi et al., 1978). The commonly observed pattern is a rapid rise to a peak of greater than 600 L.U. which persists for several days to 1-2 weeks,

followed by slow and gradual return to normal value in 2-10 weeks. Less often a multiphasic pattern is seen where the SGPT shows a next peak equal or greater than the first before recovery. The clinical features of non-A, non-B hepatitis are mostly like those of type B disease, but most of the cases are asymptomatic or anicteric and only 25% develop jaundice. The mean of serum bilirubin SGPT and alkaline phosphatase in non-A, non-B hepatitis is often less than that in type B hepatitis. Fulminant non-A, non-B infection is rare. Another important feature of this disease is its prolonged course. Twenty-six (Seef et al., 1975) to 36% (Knodell et al., 1976) of transfused subjects showed raised transaminases for 6 months. Fifty-five per cent cases showed enzymes elevation for more than 10 months in another study (Aach et al., 1978).

Percutanous needle biopsies of liver were done to find out the consequences of prolonged illness of liver. Knodell et al. (1977) reported deyelopment of chronic hepatitis in 2.2% patients with non-A, non-B disease. The absence of bridging necrosis or active cirrhosis in nearly all cases suggested that chronic active hepatitis in these cases is not necessarily progressive and 33.3% cases resolved spontaneously without therapy in 1-3 years. Chronic disease is most likely to develop in anicteric cases with SGPT of more than 300 IU. Carrier state of non-A, non-B virus has been confirmed by transmission of this infection from humans to subhumans (Hoofnagle et al., 1977).

Allen and associates (1959) pointed out difference in attack rate of hepatitis B virus associated with transfusion of commercial against volunteer donor. It was seen that the attack rate of recipients with commercial blood was 4.1% as compared to 0.7% in volunteer donors. These findings have been confirmed by other workers (Walsh et al., 1970; Alter et al., 1972; Aach et al., 1978). Volunteer donors from lower socioeconomic group (Aach et al., 1978) and military personnel have a higher attack rate of hepatitis than other volunteer donors.

Donor blood with elevated transaminases was also associated with high risk of infectivity (Bang et al., 1959). Therefore the prevalence of hepatitis could be reduced by 70% by removing blood units with SGPT of more than 40 IU. Miller et al.(1977) showed that only 17% reduction in the hepatitis would occur by eliminating blood with raised SGPT. The former studies have later been proved by Aach et al. (1978). Carcinoembryonic antigen and cholyglycine are two markers which can further identify the infectious donors.

For the prevention of post transfusion hepatitis gamma globulins have been recommended. Knodell et al. (1976) and knodell et al.(1977) showed that both standard immune serum globulin and type ‘B’ hyperimmunoglobulin, significantly reduced the frequency of icteric hepatitis and progression of non A and non B hepatitis to chronic ‘hepatitis. Seeff et al. (1977) gave immune serum globulin to transfused patients and found that it did not decrease the frequency of type B and non A Non B hepatitis. The globulin preparation however significantly reduced the prevalence of icteric non B hepatitis among recipients of at least 3 units of commercial blood, but had no effect on volunteer blood.

Recent prospective studies have shown that risk of hepatitis increases in patients receiving blood from commercial donors while the hepatitis attack in recipients of volunteer donor blood is largely independent of the volume transfused (Aach etal., 1978; Seeff et al., 1977).

The infection rate of non-A, non-B in hospitalized, non transfused patients undergoing surgery is 2.2% (Aach et al., 1978). The cause of infection was uncertain. Anaesthetic agents used, type of surgery and drugs given were all analyzed but none could be identified as causative agent.

To reduce post transfusion hepatitis several other markers have been introduced, of which anti-HBc in blood is important. Lander et al. (1978) prospectively demonstrated close correlation between post transfusion hepatitis and the presence of anti-HBc in donor blood. Hoofnagle et al. (1978) tested HBsAg negative blood known to have transmitted hepatitis B for the presence of anti HBc and all sera examined, showed this marker. Anti HBc positive blood is infectious only if it does not contain anti-HBs; the coexistence of anti HBs and anti HBc presumably reflects previous infection with recovery and loss of hepatitis B virus.

Kuhns et al. (1976) found conventional immune globulin ineffective in Non A Non B hepatitis.

There is a possibility that vaccination may reduce the incidence of viral hepatitis, but they are expected to prevent the type B disease only.
Most practical means of preventing Non-A, Non-B transfusion hepatitis is through serological screening of donors. Studies by Shirachi et aL(1978) and Kabiri et al. (1979) appear to identify non-A, Non-B candidate antigen(s).

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