Short Report

Chronic Hepatitis B and Hepatitis B Surface Antigen Carriers in University Students

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NAKAMURA, S. Chronic Hepatitis B and Hepatitis B Surface Antigen Carriers in University Students. Tohoku J. exp. Med., 1978, 124 (4), 391-392 — A study was made of latent hepatic diseases in university students. 1.4% to 1.6% of the students were positive for hepatitis B surface antigen (HBsAg), and 10.3% for anti-HBs. Of 28 students with HBs-antigenemia, 2 had chronic persistent hepatitis, and 3 minimal hepatitis, 23 being healthy carriers. Hepatitis B e-antigen (HBeAg) was detected in 44% of the students with HBsAg, and anti-HBe in 13%. Anti-HBe was significantly more frequently found in female students with HBsAg than in male students. Though most of the students with HBsAg had high titer of antibody to hepatitis B core antigen (anti-HBc), there were a small number of cases showing low titer. HBsAg and anti-HBs was detected in the same serum specimens of 2 carrier students. Liver damage was also found in 3 students without HBs-antigenemia. — — chronic hepatitis B; hepatitis B surface antigen carrier; antibody to hepatitis B core antigen; e-antigen; university students

The prevalence of hepatitis B surface antigen (HBsAg) in apparently healthy adults in Japan is intermediate between that in the other Asian and African countries and in Europe, and not small number of people are thought to have latent hepatic diseases. Hence a study was made of latent hepatic diseases in university students.

In a period of 1973-77 students of medicine or related sciences in Tohoku University were tested for HBsAg and glutamic pyruvic transaminase (GPT). 2947 observations (1763 in males and 1184 in females) were made in total. 460 students were also tested for antibody to hepatitis B surface antigen (anti-HBs). HBsAg was determined by the single radial immune diffusion (SRID) method (1973-1976) or by the reversed passive hemagglutination (R-PHA) method (1976-1977), and anti-HBs by the passive hemagglutination method. GPT was measured by Rietman-Frankel method, and values over mean plus 3 times standard deviation were considered to be abnormal. Observations were repeated yearly. When an abnormal GPT value was obtained, reexamination was made soon thereafter. Liver damage was considered to be clinically present when students showed abnormal GPT values at least twice during the observation period or GPT value over 100 Karmen units once or more. Sera of 16 to 28 students with HBs-antigenemia were sent to Hepatitis Division of Tokyo Metropolitan Institute of Medical Science, and antibody to hepatitis B core antigen (anti-HBc), e-antigen (HBeAg), and e-antibody (anti-HBe) were tested. Anti-HBc was determined by the immune adherence hemagglutination method (Tsuda et al. 1975), and HBeAg and anti-HBe by immunodiffusion.

1.4% of the students were positive for HBsAg by the SRID method, and 1.6% by the R-PHA method. A higher detectability of the R-PHA method than the SRID method was confirmed in the same group of students. 10.3% of the students were positive for anti-HBs. Although higher incidence of HBsAg was observed in male students (1.9%) than in female students (0.8%), there was no sex difference in anti-HBs. No students

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who were at first negative for HBsAg became positive during the yearly observations except at the time of change of the methods from the SRID method to the R-PHA method. GPT was abnormal in 0.8% of the students at the first examination. Liver damage defined above was found in 0.3% of the students, namely, in 5 students with HBs-antigenemia and in 3 students without HBs-antigenemia. All the students with liver damage were male.

As for 28 students who were found to have HBsAg on 44 observations, 22 were male and 6 were female. Among them 18 students were also tested for anti-HBs; 16 of them were negative and 2 were positive for anti-HBs. Of the 16 HBsAg positive students who were tested also for anti-HBc, 13 showed high titer of anti-HBc, namely, 211 or more. One had titer of 210, and one 2. However, the other one (a healthy HBsAg carrier) revealed low titer of 2 or less. HBeAg was detected in 7 of the 16 students with HBsAg (44%), and anti-HBe in 2 (13%). The other 7 students (44%) had neither HBeAg nor anti-HBe. HBeAg was found in 6 of the 12 male students with HBsAg and in one of the 4 female students with HBsAg while anti-HBe was detected only in 2 female students. The sex difference of incidence of anti-HBe was statistically significant (p<0.05). The average age (21.5 years) of male students with detectable HBeAg was significantly younger than that (24.8 years) without HBeAg (p<0.02). The average age (22.5 years) of the female students with HBsAg was not older than that (23.2 years) of male students with HBsAg. History of liver disease and/or HBs-antigenemia was frequently found in mothers of students with HBsAg.

Hepatic changes in the students were classified as follows: Among 28 students with persistent HBs-antigenemia, 2 (7%) had GPT value over 100 Karmen units on several occasions, and were shown by liver biopsy to have chronic persistent hepatitis. 3 HBsAg positive students (11%) showed GPT value which fluctuated between the normal and slightly abnormal values, and were thought to have minimal hepatitis. The other 23 students always showed normal GPT and were thought to be healthy HBsAg carriers.

Of the 3 HBsAg negative students with liver damage, 2 had previous history of blood transfusion at ages of 5 and 6 years, suggesting non-A, non-B chronic hepatitis. Though one of them was obese, his overweight was slight (+13%). Except this student no HBsAg positive or negative students with liver damage showed overweight. No students with liver damage were excessive drinkers.

Thus, the present study shows that HBsAg carrier state was found in 1.4% to 1.6% of university students, and that 7% of them had chronic persistent hepatitis and 11% had minimal hepatitis. It is noteworthy that 44% of the students with HBsAg were positive for HBeAg and seemed to have high infectivity. Since some of them are dental students, it presents a serious problem of preventing hepatitis B virus infection from the students to patients. Sex difference in anti-HBe is of special interest from viewpoint of understanding the course of hepatitis B infection.

Although it is pointed out that cirrhotic patients with persistent hepatitis B infection have high titer of anti-HBc (Kojima et al. 1977), this study shows that asymptomatic HBsAg carriers have not always high titer of anti-HBc. It is also to be noted that HBsAg and anti-HBs were detected in the same serum specimens of 2 carrier students.

References