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Chemical Liver Function Tests and Epidemiologic Studies of HBsAg Positive Blood Donors

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The HBsAg positivity in age, sex, occupation, blood type, past history and chemical liver function tests were analyzed in 869 cases without symptoms of liver disease and postive testing for HBsAg by RPHA method, who were selected among 11,197 blood donors of the Red-Cross Blood Bank in Pusan, Korea from August 1, to September 30, 1982.

The following results were obtained:

1) The overall HBsAg positivity in random blood donors was 7.76%.

2) The HBsAg positivity of males was 8.36% and females 6.0%; males had a slightly higher positivity than females.

3) The HBsAg positivity of the 16-20 year old age group had the highest frequency (9.05%), 21-25 year old age group 8.23%, 26-30 year old age group 5.72%, 31-35 year old age group 5.76%, 36-40 year old group 5.85%, 41-45 years old age group 4.76%, and 46-50 year old age group 3.7%. HBsAg positivity had decreasing tendency of frequency by increasing age.

4) The HBsAg positivity of the merchant group had the highest frequency (10.26%), and next, the unemployed, salary man, student, soldier, in order of frequency.

5) The HBsAg positivity in cases with blood type A had the highest frequency (8.07%), and next, cases with B type, O type, and AB type in order of frequency.

6) The HBsAg positivity in cases with no past history in liver disease had the highest frequency (75.37%), and next, cases with history of liver diseases among family 12.54%, hepatitis with jaundice 5.06%, admission due to other diseases except liver diseases 3.57%, transfusion 2.42%, hepatitis without jaundice 1.04%.

7) In chemical liver function tests of HBsAg positive blood donors, elevation of SGPT level showed highest frequency (10.70%), SGOT 7.7%, total serum bilirubin 5.29% and elevation of one or more than of SGPT, SGOT, total serum bilirubin 18.99%.

Key Words: *Chemical liver function test, HBsAg, Blood donor*

INTRODUCTION

HBV hepatitis may be understood to bring on a carrier state even though viral diseases have not been known to do so in human host. This is the most reliable characteristic, which may give determination on the diagnosis and prognosis for HBV hepatitis.[1)]

Until today, an exact definition for a HBV carrier has not been completely defined yet, but whether a carrier has symptoms of liver damage or not and has chronic liver disease (chronic hepatitis, liver cirrhosis, hepatocellular cancer or not, all tend to be generally implied in this category as a HBV carrier.

Although the great clinical interest is that HBsAg chronic carriers are the source of hepatitis type B

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infection,[2] the clinical course and prognosis have not been determined yet, so that clinical and epidemiological studies about the disease are needed to be studied focussing on HBsAg chronic carrier in a country with high incidence of HBV hepatitis such as Korea.

So far there have been no conclusive reports in this country, and no reports about liver function tests in HBsAg positive blood donors. We reviewed the HBsAg positivity in the group of random blood donors according to age, sex, occupation, blood type, and past history, and studied the biochemical liver function tests in HBsAg positive blood donors.

MATERIALS AND METHODS

The HBsAg positivity in age, sex, occupation, blood type, past history and the chemical liver funvtion tests were analyzed in 869 cases without symptoms of liver damage and disease and positive results for HBsAg testing by RPHA method, who were selected among 11,197 blood donors of the Red-Cross Blood Bank in Busan, Korea from August 1, to September 30, 1982. RPHA method with Serodia-HBs Kit (Reverse Passive Hemagglutination: RPHA) was used to find HBsAg in serum and SGOT, SGPT, and bilirubin were analyzed by the autochemical analyzer (Abott Co. in U.S.A.).

RESULTS

1) HBsAg positivity of blood donors

Eight hundred and sixty nine cases out of 11,197 blood donors were positive for HBsAg, which gives 7.76% in HBsAg positiviity of blood donors (Table 1).

2) HBsAg positivity in age

The HBsAg positivity of 16-20 year old age group had the highest frequency (9.05%), 21-25 year old age group 8.23%, 26-30 year old age group 5.72%, 31-35 year old age group 5.76%, 36-40 year old age group 5.85%, 41-45 year old age group 4.76%, and 46-50 year old age group 3.7%. HBsAg positivity had a decreasing tendency of frequency by increasing age age (Table 2).

3) HBsAg positivity in sex

The HBsAg positivity of male was 8.36% and female 6.0%, males had a slightly higher positivity than females (Table 1).

4) HBsAg positivity in occupation

HBsAg positivity of the merchant group had the highest frequency (10.26%), and the next, the unemployed, salary man, student, soldier, in order

Table 1. Sex prevalence of HBsAg carriers among blood donors

Sex	Total No.	Carrier No.	Percent
Male	8,348	698	8.36
Female	2,849	171	6.00
Total	11,197	869	7.76

Table 2. Age prevalence of HBsAg carriers among blood donors

Age	Total No.	Carrier No.	Percent
16-20	4,776	432	9.05
21-25	2,831	233	8.23
26-30	2,467	141	5.72
31-35	834	48	5.76
36-40	188	11	5.85
41-45	63	3	4.76
46-50	27	1	3.70
51-55	11	0	0.00
Total	11,197	869	7.76

Table 3. Occupational prevalence of HBsAg carriers among blood donors

Occupation	Total No.	Carrier No.	Percent
Student	5,341	450	8.42
Salary man	3,605	305	8.46
Soldier	1,678	105	6.26
Merchant	156	16	10.26
The unemployed	297	26	8.75
Others	120	11	9.17
Total	11,197	869	7.76

Table 4. Prevalence of HBsAg by blood type among blood donors

Blood type*	Total No.	Carrier No.	Percent
O	2,625	219	7.49
A	3,917	316	8.07
B	3,115	244	7.83
AB	1,240	90	7.26
Total	11,197	869	7.76

* $P>0.05$

Table 5. Correlation between past history and occurrence of HBsAg

Past history	HBsAg (+)	
	No. of cases	Percent
Hepatitis with jaundice	44	5.06
Hepatitis without jaundice	9	1.04
Transfusion	21	2.42
Liver disease among family	109	12.54
Admitted due to other disease	31	3.57
No specific past history	655	75.37
	869	100.00

Table 6. Prevalence of abnormal liver function test among blood donors

Abnormal LFT	No. of cases	Percent
SGPT>35 (RF)	93	10.70
SGOT>40 (RF)	67	7.71
Total bilirubin>1.0 (mg%)	46	5.29
Either	165	18.99

of frequency (Table 3).

5) HBsAg positivity in blood type

Type A had the highest frequency in HBsAg positivity with 8.07%, type B 7.83%, type O 7.49% and type AB 7.26%. Consequently there was no significant difference between the blood groups (Table 4).

6) HBsAg positivity in past history

The HBsAg positivity is 5.06% in past history of hepatitis with jaundice, 1.04% in hepatitis without jaundice, 2.42% in blood transfusion, 12.54% in the liver disease among family, 3.57% in the cases admitted due to other disease, 75.37% in nospecific past history (Table 5).

7) Results from liver function tests in HBsAg positive blood donors.

In 869 cases the level of SGPT was elevated in 93 cases (10.7%), which showed the highest frequency, SGOT in 67 cases (7.71%), total serum bilirubin in 46 cases (5.29%) and either one of SGPT, SGOT, and total serum bilirubin were elevated in 165 cases (Table 6).

DISCUSSION

Although the accurate percentage for the incidence of the symptomatic and asymptomatic hepatitis is not completely known yet, in normal people it is variable from 0.1% to 22% according to sex,[3-5] race,[6-7] age,[8] and socioeconomic[3,4] state and also variable with the different laboratory tests.[4] The incidence has been relatively higher in blood-recipients rather than donors, hospital employees[3,9] (doctor, dentist, workers in cancer centers, medical laboratory, and artificial kidney room), neonates[10] of HBsAg positive mothers, and relatives of HBsAg carriers.[7]

The HBsAg positivity is known to be around 8% in asymptomatic Koreans[3,11] and our data of 7.76% is similar to the data, 8.73% by Kim et al.[3]

In sex, HBsAg positivity is 8.36% in male and 6.0% in female on our studies and the positivity is a little higher in males than in females in accordance with the reports by Kim (8.90% in male, 5.85% in female), Blumberg,[5] and Szmuness et al..[12]

In age, the highest HBsAg positivity is 9.05% in the group between age 16 to 20, and the next is 8.23% between age 21 to 25. These show the highest positivity in young groups of 10 to 30 years old age, and the positivity tends to be lower with increasing age in accordance with the reports by Kim,[3] Banke,[13] and Szmuness et al.[12]

In occupation, the higher incidence of HBsAg positivity has been reported in hospital employees[3,9] but there has been no significant differences in the rest of the group.[3,9] We have found that the HBsAg positivity of merchants is highest, 10.26%, and then the unemployed, salary man, students, soldiers in order, but because they are selected among blood donors, it is hard to believe that the order of the incidence itself shows the positivity in each occupation.

According to blood groups, group A has the HBsAg positivity of 7.49%, group B 8.07%, group O 7.26%, and group AB 7.83%, which now shows no significant differences in blood group and the results are same as Szmuness have had in the HBsAg positivity of HLA type[8] and ABO-Rh type.[4]

In past history, we have found that HBsAg positivity is 5.06% in the past history of hepatitis with jaundice, 1.04% for the hepatitis without jaundice, 2.42% for the blood transfusion, 3.57% in the cases admitted to hospital dué to other diseases and 75.37% in the nonspecific past history. These results show the higher positivity in the group with history of hepatitis than the results reported by Feinmun et al.[14] who reported the HBsAg positivity in according to occupation such as 0.87% with history of hepatitis, 6.9% with blood transfusion, 5.19% in group with hepatomegaly, 80.87% in the nonspecific

past history. From the results, we can suggest that the cause of the highest HBsAg positivity in the past history of hepatitis is directly related to the reports that the incidence of hepatitis in Korea is higher than in Europe.[15] We believe that the highest HBsAg positivity in the nonspecific past history suggests that HBsAg carrier may be found much more in the cases of asymptomatic hepatitis than symptomatic hepatitis,[16-18] and we also should consider the positivity that vertical transmission from HBsAg positive mother to the her neonate may result in a permanant asymptomatic carrier state.[1] The HBsAg positivity is relatively high (12-54%) in the cases having family members with liver disease and it seemed to be from frequent contact with patients. Therefore it is noted, patient contact should be with caution.

There are different ideas about changes on liver function tests[12,19] and histopathologic changes[19,20] in asymptomatic HBsAg carriers. Vital,[2] Siman and Patel et al.[22] reported that asymptomatic HBsAg carriers had abnormal histologic findings in all of the cases and abnormal liver function tests in most cases. But Feiman[14] reported 30% of asymptomatic carriers had abnormal results in liver function tests, Koshi-Sakuma[23] had 16.3% of asymptomatic carriers, ours is 18.99%, which is similar to Sakuma's result.

In HBsAg positive blood donors, SGPT was higher than normal in 10.7%, SGOT in 7.71% and total bilirubin in 5.29% in our study. These results are considered to be in accordance with the results that Feiman et al.[14] reported, but are different from Allan-Kliman,[24] which show SGOT was more frequent than others. Although results of liver function tests are normal in HBsAg carriers, liver biopsy findings may show reactive hepatitis, focal hepatitis, chronic persistant or active hepatitis, and cirrhosis.[19,25,26] Therefore a liver biopsy should be performed with the liver function tests.

Considering that our study has been done in a short period, the longterm followup study must be done including epidemiologic study, liver function tests, and liver biopsy in chronic persistent HBsAg carriers.

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