

HEPATITIS B MARKERS IN NON-ICTERIC MEDICAL PATIENTS IN MALAYSIA

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INTRODUCTION

It has been generally accepted that both patients and staff of the haemodialysis unit are highly exposed to hepatitis B virus. This is true also for Malaysia (Ton *et al.*, 1984). Although the exposure rate in medical wards is suspected to be high as well, no studies had been conducted to date on this group of patients except one on 11 patients only (Ton *et al.*, 1984).

It was thus decided to test the patients in the medical units suffering from illnesses other than overt hepatitis and to determine the HBsAg carrier rate (infectious or otherwise) as well as the exposure rate to HBV in various age, sex and racial groups in urban and rural settings.

MATERIALS AND METHODS

Serum samples were obtained from 494 non-icteric patients admitted, with illnesses other than overt hepatitis, into the medical wards of several hospitals, district and general, in Malaysia. The different age-groups, sex and racial groups were represented. The patients were regarded as urban dwellers when the hospital they had been admitted to serve relatively well developed towns and cities with modern sanitation. Their rural counterparts were patients admitted into district hospitals catering to people living in small villages, mostly without modern sanitation. However, because of the on-going

national rural development policy, it is not uncommon that some district hospitals serve towns which are in various stages of development, and therefore some degree of overlapping in area demarkation has to be allowed.

Sera from 178 normal subjects (staff members of the Institute for Medical Research) were tested for levels of aspartate aminotransferase (AST) and alanine aminotransferase (ALT). These values were compared with those in the sera of 99 of the patients tested for the hepatitis B markers.

Enzyme immunoassay (EIA) was performed for the detection of HBsAg, HBeAg and anti-HBs using the commercially available kits, Ausyme II, HBe-EIA, Ausab-EIA respectively (Abbott Laboratories, Chicago, III., U.S.A.).

The serum aspartate aminotransferase (AST) and alanine aminotransferase (ALT) were determined according to the methods recommended by the International Federation of Clinical Chemistry (Bergmeyer, 1976, 1977, and 1980) using Tris buffer, reaction temperature of 37°C and five-minute analysis time. The analyses were done using the Abbott Biochromatic Analyser ABA 100.

RESULTS AND DISCUSSION

HBsAg: The age, race and sex distributions of HBsAg are shown in Table 1. The overall HBsAg carrier rate was 18.0%. The rates increased sharply from 9.6% in children (10 years and under) to a peak of 23.5% in the adolescent group (11 to 20 years), then

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Table 1

Age, race and sex distribution of hepatitis B markers in non-icteric Malaysian medical patients.

Group	No. tested	HBsAg	HBeAg*	anti-HBs	HBsAg + anti-HBs
		No. pos. (%)	No. pos. (%)	No. pos. (%)	No. pos. (%)
≥ 10 years	104	10 (9.6)	3 (2.9)	19 (18.3)	29 (27.9)
11-20 years	132	31 (23.5)	7 (5.3)	37 (28.0)	68 (51.5)
21-40 „	133	22 (16.5)	3 (2.3)	53 (39.8)	75 (56.3)
41-60+ „	125	26 (20.8)	1 (0.8)	58 (46.4)	84 (67.2)
Total	494	89 (18.0)	14 (2.8)	167 (33.8)	256 (51.8)
Chinese	161	30 (18.6)	10 (6.2)	67 (41.6)	97 (60.2)
Malay	266	53 (19.9)	3 (1.1)	78 (29.3)	131 (49.2)
Indian	67	6 (9.0)	1 (1.5)	22 (32.8)	28 (41.8)
Total	494	89 (18.0)	14 (2.8)	167 (33.8)	256 (51.8)
Male	272	45 (16.5)	9 (3.3)	97 (35.6)	142 (52.1)
Female	222	44 (19.8)	5 (2.3)	70 (31.5)	114 (51.3)
Total	494	89 (18.0)	14 (2.8)	167 (33.8)	256 (51.8)

*Out of 89 HBsAg-positive sera, 14 (15.7%) were HBeAg-positive.

decreasing to 16.5% and 20.8% in the adult and middle-aged groups, respectively. The Chinese (18.6%) and Malays (19.9%) had similar HBsAg carrier rates but the rate in the Indians (9.0%) was distinctly lower ($p < 0.05$). No significant difference was observed

between the males (16.5%) and the females (19.8%).

The Blood Services Centre of Kuala Lumpur, Malaysia, reported that for the year 1984, out of a total of 24,747 blood donors

examined by radioimmunoassay (RIA), about 3.1% were HBsAg positive. The racial distribution was Chinese 5.0%, Malays 2.9% and Indians 0.8% (Lopez, in press). As the majority of these donors came from various parts of Malaysia although they were staying in Kuala Lumpur for educational or occupational reasons (eg. as students of a residential college, police and army personnel) these figures could be regarded as representative of the healthy population in West Malaysia. A much higher prevalence rate of HBsAg carriers was noted in East Malaysia (11.4%). Compared with the HBsAg carrier rate in normal West Malaysians (3.1%) the rate found in the medical patients (18.0%) was much higher although none of them had clinical features to indicate liver disease.

It was interesting to note that the HBsAg carrier rate in the Indian Malaysians has been consistently lower than that of the other communities in the country. This was evident in every one of the studies carried out so far in Malaysia. In the Indian subcontinent and in Sri Lanka the rate was observed to be 1% to

2% (Prasad, 1981) and 0.9% (Vitrana *et al.*, 1978), respectively. Gust and co-workers (1978) detected a rate of less than 1% in resident Indians compared with 10% in the native Fijians in Viti Levu, Fiji Islands.

The HBsAg carrier rate in the Malaysian urban area was on an average greater than in the rural area (Table 2). The adolescent group in the urban locality shows a significantly higher rate than the same age-group in the rural locality ($p < 0.005$). This is probably an indicator of the different life-style adopted by this age-group in the two areas.

Anti-HBs: Table 1 shows the age, race and sex distribution of anti-HBs in the patients. The overall rate was 33.8% the levels increasing with advancing age. This indicates constant reinfection subsequent to the initial infection and a long-lasting antibody. Because of this, acute HBV infection is not commonly encountered in the country and only 4.1% of acute hepatitis cases had been found to be due to hepatitis B virus (Tan *et al.*, 1986).

Table 2

Age and area distribution of hepatitis B markers in non-icteric Malaysian medical patients.

Age (years)	HBsAg		anti-HBs	
	Rural	Urban	Rural	Urban
7-10	3/30 (10.0)	6/35 (17.1)	7/30 (23.3)	7/35 (20.0)
11-20	8/64 (12.5)	23/68 (33.8)	24/64 (37.5)	20/68 (29.4)
21-40	10/61 (16.4)	12/72 (16.7)	33/61 (54.1)	27/72 (37.5)
41-60+	16/62 (25.8)	10/63 (15.9)	36/62 (58.1)	31/63 (49.2)
Total	37/217 (17.1)	51/238 (21.4)	100/217 (46.1)	85/238 (35.7)

Percentage positive shown in parenthesis.

The difference in the racial distribution of anti-HBs were significant ($p = 0.033$), the Chinese being more highly exposed than the Malays or the Indians. Although the HBsAg carrier rate was much lower in Indians than in the Chinese and Malays, the Indians were as highly exposed as the other two ethnic groups. No significant difference was detected between males and female.

The anti-HBs rates in both rural and urban areas increased with advancing age, the rural group having significantly higher proportions of positives than the urban group (Table 2).

HBeAg: This marker, which indicates the degree of infectivity was found in only 2.8% of the total patients examined and in 15.7% (14/89) of patients positive for HBsAg. The age distribution, although apparently higher in the adolescent group, was not significantly different among the four age-groups ($p > 0.10$). However, the Chinese patients (6.2%) were significantly more infectious ($p = 0.007$) than the Malays (1.1%) or the Indians (1.5%). The males (3.3%) and females (2.3%) had similar rates.

Serum levels of the transaminase (ALT and AST) activities were estimated in 99 of the

medical patients and compared with those of apparently normal people (staff of the IMR). The mean values of ALT and AST in the patients were 51.1 IU and 49.1 IU, respectively (Table 3). These figures were slightly greater than those of the ALT and AST estimates in the normal subjects (25.6 IU and 24.2 IU, respectively). This probably indicates disorders not necessarily associated with the liver or any specific organ but with non-specific causes e.g. peripheral circulatory insufficiency, trauma, surgery, malignancy etc.

SUMMARY

Sera were obtained from 494 non-icteric patients admitted with illnesses other than overt hepatitis into the medical wards of the rural and urban hospitals in Malaysia. They were tested for HBsAg, HBeAg, and anti-HBs by enzyme immunoassay.

The overall HBsAg carrier rate was 18.0% ranging from 9.6% in children, (10 years and under), to a maximum of 23.5% in the adolescents (11 to 20 years), the rates decreasing subsequently to 16.5% and 20.8% in the adult and middle-age groups, respectively. The Chinese (18.6%) and Malays (19.9%) had similar HBsAg carrier rates but the rate

Table 3

Liver function test results in normal subjects compared with non-icteric medical patients.

Group (n)	ALT*			AST**		
	\bar{X}	Range	S.D.	\bar{X}	Range	S.D.
Normal (178)	25.6	2-155	21.2	24.2	7-81	11.2
Patients (99)	51.1	8-895	95	49.1	9-430	61.1
HBs-positive (18)	44.7	10-109	29.0	56.6	9-320	71.5
HBe-positive (3)	53.7	14-96	41.1	70.3	16-109	48.4
Anti-HBs-positive (34)	46.3	15-180	36.9	56.8	13-320	70.1

*ALT = alanine aminotransferase.

**AST = aspartate aminotransferase.

in the Indians (9.0%) was distinctly lower. Similar rates were observed in the males (16.5%) and the females (19.8%). The carrier rate was 17.1% in rural patients compared with 21.4% in the urban ones.

The 'e' antigen was found in 14 of the 89 HBsAg carriers (15.7%). The overall prevalence was 14/494 (2.8%) rising sharply from childhood (2.9%) to adolescence (5.3%), subsequently declining with advancing age. The Chinese had the highest rate (6.2%) followed by the Indians (1.5%) and the Malays (1.1%). Males had a rate of 3.3% compared to the females with 2.3%.

Anti-HBs was found in 33.8% of the patients, increasing steadily from childhood (18.3%) to middle-age (46.4%). The Chinese had a higher prevalence rate (41.6%) than the Indians (32.8%) and the Malays (29.3%). The rates were similar for the males (35.6%) and the females (31.5%). Rural patients (46.1%) had a higher rate than urban patients (35.7%). Both areas showed rising prevalence with increasing age. The liver function test results in the non-icteric patients were compared with those in normal patients and were found to be significantly raised.

It may be concluded that as the HBsAg carrier rate in hospitalized patients (18%) was much higher than that in the normal population (3.1%), although none of them had clinical features to indicate liver disease, hospitalized patients appear to run a greater risk of being exposed to HBsAg than non-hospitalized patients. The higher HBs carrier rate in the urban adolescent age-group as compared with that in their rural counterpart seems to indicate the greater tendency for this

age-group to be exposed in urban rather than rural areas.

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