ASYMPTOMATIC HEPATITIS B ANTIGEN(S) CARRIERS IN SINGAPORE: SEROLOGICAL REASSESSMENT

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SYNOPSIS

As an extension of a household study on asymptomatic hepatitis B (HBV) infections, a follow-up of the HBV antigen carriers was done. Among 127 HBsAg(+)/ HBeAg(−) mothers, 6.2% lost their antigenaemia while 15.2% of 118 HBsAg(+)/HBeAg(+) mothers lost their HBeAg positivity.

HBV antigen(s) carrier state among their children was mostly that of HBeAg positivity. At follow-up, the HBsAg(+)/HBeAg(−) children showed various forms of conversion while the HBsAg(+)/HBeAg(+) children remained largely unchanged. Only 2% lost their HBeAg positivity.

The implications of the spontaneous antigen clearance and the need for continued monitoring of persistent carriers are discussed.

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INTRODUCTION

Asymptomatic hepatitis B (HBV) antigen carriers constitute a public and personal concern in endemic regions like that of Singapore. Being asymptomatic, only follow-up serology can verify the chronicity of the antigenaemia. This report is based on the follow-up of a household study. The main objectives are:

(1) to ascertain the stability of the carriers status;

(2) to consider the associated implications.

MATERIALS AND METHODS

This study is an extension of a household study conducted in Kandang Kerbau Maternity Hospital in Singapore. A total of 262 mothers were recruited in the postnatal clinic. They were all found to be asymptomatic HBV carriers during their routine antenatal visits. Their children were invited for HBV serological assessment while their newborns were given HBV vaccination.

All of these 262 asymptomatic HBV antigen carrier mothers and their children found to be carriers were contacted for serological reassessment at the end of 1985. The interval between their first serological assessment and the follow-up session was at least 6 months. Out of 262 mothers, 6.5% were lost to contact or refused to participate. Among 124 HBV antigen positive children of these mothers 11.2% did not show up for similar reasons.

Enzyme immunoassay (Abbott) was performed through the Ransome Research Laboratory. The usual precautions were observed to ensure accuracy of the assay. When the results were borderline the whole laboratory procedures were repeated. Otherwise only single assay was performed. Data analysis was performed through the IBM-mainframe facility of the National University of Singapore using SPSS software.

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RESULTS

The majority (90.8%) of the mothers were of Chinese ethnicity and 40.8% had only up to primary education reflecting the general population in Singapore and the population that utilize government maternity hospital facility. The mean age of these mothers was 29 (range: 17–44). The mean age of their children was 4.47 (range: 1–16). Sex distribution among these children was equal.

Only 8 out of 127 mothers (6.2%) who were HBsAg(+)/HBsAg(−) lost their antigenaemia. Among mothers who were HBsAg(+)/HBeAg(+), 15.2% lost their HBeAg antigenaemia while 0.8% lost both HBsAg and HBeAg (Table 1).

Most of the antigen-carrier children of these mothers were HBeAg(+) to begin with. At follow-up, the HBsAg(+)/HBeAg(−) group showed various types of change while the HBsAg(+)/HBeAg(+) group remained very stable. Only 2% lost their HBeAg positivity (Table 2).

The intervals between the initial and the follow-up serological assessments were all at least 6 months, in keeping with the definition for chronic HBC carrier. For the maternal carriers the maximum duration of this interval was 65 months while it was less than 24 months for their carrier children. Most of the reassessments were conducted 12 months after their first-bleed (Table 3). The mean interval for the mothers was 16.98 months while that for their children was 14.21 months.

DISCUSSION

All the maternal carriers were found to be positive for HBV antigen(s) antenatally through routine screening. The spontaneous clearance of HBsAg (6.2%) and HBeAg (15.2%) among the two types of maternal carriers indicates the need to reassess their serological status should they conceive once more. Even if there were no further pregnancy, it would ease the mind of some to know if they have cleared their antigen.

For children who have been found to be asymptomatic HBeAg carriers, findings of the present study appear to indicate that their reassessment is not as urgent since they remain very stable. However, for these children and their mothers the need to monitor

TABLE 1

SEROLOGICAL STATUS OF ASYMPTOMATIC HBV-ANTIGEN CARRIER MOTHERS (%)

Initial status	HBV status at Follow-up*			
	S(-) E(-)	S(+) E(-)	S(+) E(+)	Total
S(+) E(-)	8 (6.2)	119 (93.8)	0	127 (100.0)
S(+) E(+)	1 (0.8)	18 (15.2)	99 (84.0)	118 (100.0)

E = HBeAg S = HBsAg (both by E.I.A)

* follow-up bleed was done at least 6 months later.

TABLE 2

SEROLOGICAL STATUS OF ASYMPTOMATIC HBV-ANTIGEN CARRIER CHILDREN (%)

Initial status	HPV status at Follow-up*				
	S(-) E(-)	S(+) E(-)	S(+) E(+)	S(+) E(?)	Total
S(+) E(-)	2 (22.2)	5 (55.6)	2 (22.2)	0 (0.0)	9 (100.0)
S(+) E(+)	0 (0.0)	2 (2.0)	97 (97.0)	1 (1.0)	100 (100.0)

E = HBeAg S = HBsAg (both by E.I.A.)

E(?) = HBeAg status unknown due to inadequacy of blood collected.

* follow-up bleed was done at least 6 months later.

TABLE 3

DISTRIBUTION OF THE ASYMPTOMATIC HBV CARRIERS ACCORDING TO THE INTERVAL BETWEEN THEIR INITIAL AND FOLLOW-UP SEROLOGICAL ASSESSMENTS

Interval (mths)	Mothers N = 245	Children N = 109
6 - 11	10.6	22.7
12 - 23	80.4	77.3
24+	9.0	-
Total	100.0	100.0

their associated liver disorder(s) should not be overlooked.

The spontaneous clearance of HBeAg among the mothers was 15.2% and 2% for their children. Both of these figures are lower than those reported elsewhere: 20–25% for adults and 10–20% for children who are asymptomatic carriers (1–5). For this study, the interval between the two bleeds for the maternal carriers and their carrier children differed only slightly. The mean interval for the mothers was 16.98 months and that for their children was 14.21 months. The influence of this variable on the HBeAg clearance rate was probably very minor. In other words, the reason why it was 15.2% for the mothers and only 2% for their children could not have been attributed to any large extent by a difference in the interval between their two serological assessments. It is reasonable to assume that a difference in the immunological competence may play a major role in the ability to clear HBV antigens.

It is comforting to know that the presence of HBeAg has not been related to the degree of hepatic histological activity and the progression of the associated liver pathology (6–9). This is not to be confused with the fact that HBsAg carriers, compared to non-carriers (10), are at higher risk to developing primary hepatic carcinoma. However, on an individual level, one should stress that most carriers do not develop complications. As an illustration, let us assume that the well-known Taiwan findings among asymptomatic HBV men were applicable to the local setting: the incidence of primary hepatic carcinoma was 527/100,000 for carriers compared to 2.6/100,000 for non-carriers. The relative risk was estimated to be 217 which sounds very frightening. However, for carriers, only 0.5% will develop primary hepatic carcinoma (over a mean follow-up of 6.2 years as in that study). Perhaps this strategy can be employed in consoling carriers while they are being monitored regularly.

Chronic HBV antigen carriers and their elevated susceptibility to the hepatotoxic effect of alcohol has been a source of controversy. The general consesus is towards reducing or abstaining alcoholic beverages (11–17). This should be the other emphasis in the care of chronic carriers, especially the adults.

Finally, the role of anti-viral in the treatment of chronic carriers can be considered. One has to bear in mind the side effects and its potential benefit that should be long term. The presence of spontaneous clearance of antigenaemia should be adjusted for in evaluating the efficacy of anti-viral regimen.

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