

INFECTIOUSNESS WITH RESPECT TO HBV OF MEDICAL STAFF AND PATIENTS IN THE GENERAL HOSPITAL, KUALA LUMPUR

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SYNOPSIS

The infectiousness with regard to HBV infection of staff and patients in various units of the General Hospital, Kuala Lumpur was assessed. It was found that all units, with the exception of the obstetric unit, were equally high risk areas. At least 50% of the patients in all these units had one or more of the markers. Among the medical staff, the anaesthetists had the highest incidence of HBV markers (100%) while medical officers who had worked for three years or more were more likely to have the HBV markers. The degree of infectiousness of the nurses in HDU and ICU/OT was found to be similar.

INTRODUCTION

The hepatitis B virus (HBV) is a DNA virus and associated with it are three antigens and their corresponding antibodies i.e. the surface antigen (HBsAg), core antigen (HBcAg) and the e antigen (HBeAg) (1). Except for the HBcAg, all the antigens and their antibodies can be determined in the serum of an individual infected with the virus. In view of the fact that medical and health care staff and patients in certain units in a hospital are at a higher risk to hepatitis B virus infection (2) and also the fact that the incidence of HBV markers is already high in the Malaysian population (3, 4) we decided to determine the HBV profile in some staff and patients in various units in the Kuala Lumpur hospital and to determine the infectiousness of these individuals with respect to HBV infection.

MATERIALS AND METHODS

Sera were processed from blood taken aseptically from various groups as described (3). The groups included surgeons, anaesthetists, physicians, pathologists and nurses, while patients came from the haemodialysis unit, those who had undergone renal transplant, patients from the orthopaedic, surgery, obstetric and medical units. Some outpatients at the renal unit were also assayed for the HBV markers. Patients from these units were selected at random.

Determination of the HBV markers was done by using commercial RIA kits supplied by Abbott Laboratories. HBsAg was assayed by Ausria II, anti-HBc by Corab, anti-HBs by Ausab while HBe/anti-HBe by Abbott-HBe. Radioactive counting was done in the Packard Autogamma Scintillation Spectrometer Model 5110.

RESULTS

The results were interpreted according to the patterns of Mushahwar et al (5). The slightly modified pattern and interpretation is shown in Table 1. As seen in Table 2, the exposure rate (as indicated by the presence of any one of the HBV markers) was high and similar in all the category of patients except in those from the obstetric unit. Patients with marker combination of columns I, II and III are classified as infectious. As such the degree of infectiousness of these patients was again similar except in the obstetric unit where the patients were less infectious. Pattern VI was more frequently encountered in patients undergoing haemodialysis.

The anaesthetists, surgeons and physicians seem to be the most exposed as judged by the presence of the markers. However, two out of six of the anaesthetists belong to the infectious group and the anaesthetists appear to be the highest exposed group (100%). Not much difference was observed in the nurses from either the intensive care unit (ICU)/operating theatre (OT) or the haemodialysis unit (HDU). The exposure rate was the same.

DISCUSSION

Pattern VI is commonly observed in patients undergoing haemodialysis and this observation has also been made by Mushahwar et al (5) who frequently encountered such pattern in homosexuals, drug addicts and some haemophiliacs and renal dialysis patients where frequent exposure and reexposure to HBV is common. It appears that all units examined, with the exception of the obstetric unit, are equally high risk areas. At least 50% of the patients in all the units, with the exception of the obstetric unit, have one or more of the markers.

Exposure in the medical and health care staff is also high. The highest being in the anaesthetists. Of the three physicians who have the markers, two are from the nephrology unit. It is interesting to note that the HBV markers generally are found in medical officers who have worked for three or more years after graduation. The degree of infectiousness of the nurses in both categories is similar.

Although haemodialysis unit is generally considered a high risk area for HBV transmission and spread, this study indicates that other clinical areas can be equally high risk areas as well.

TABLE 1: PATTERNS OF HBV MARKERS AND THEIR INTERPRETATIONS (MUSHAHWAR ET AL⁵)

Pattern	HBV Markers	Interpretation
I	Only HBsAg or + anti-HBc	Late incubation or carrier state
II	HBsAg + HBeAg only/or + anti-HBc	Acute or chronic hepatitis infection; active viral replication, likelihood of infectivity high.
III	Only anti-HBc	'Gap' period between disappearance of HBsAg and HBeAg and appearance of anti-HBe and anti-HBs; potentially infectious. This may occur (a) in 'silent' carriers of HBV where HBsAg is below the threshold of detectability (b) the 'convalescence window', a period between the decay of HBsAg below detectability and prior to sero-conversion to anti-HBs.
IV	HBsAg + Anti-HBc + anti-HBs	Early recovery phase.
V	Anti-HBc + anti-HBs only/or + anti-HBe	Recovery phase of hepatitis B infection, indicative of past infection and persisting immunity.
VI	HBsAg + Anti-HBc + Anti-HBe + Anti-HBs	Frequent exposure and reexposure.

TABLE 2: PATTERNS OF HBV MARKERS IN MEDICAL STAFF AND PATIENTS IN THE GENERAL HOSPITAL, KUALA LUMPUR

Category	PATTERNS								
	Exposed/No. Assayed	Not Exposed 0	Late incubation/Carrier (infectious) I	Acute/Chronic (infectivity high) II	'Gap' (potentially) infectious III	Early recovery IV	Immunity V	Frequent Exposure VI	Infectiousness
Staff									
Surgeons 11/19 (58%)	8			1			10		1/19 (5%)
Anaesthetists 6/6 (100%)			1		1		4		2/6 (33%)
Physicians 3/4 (75%)	1						3		0
Pathologists 1/4 (25%)	3						1		0
Medical Officers 21/54 (39%)	33		1	1	2		17		4/54 (7%)
Nurses									
ICU + OT 16/42 (38%)	26		2				11		5/42 (12%)
HDU 6/18 (33%)	12		1	1	1		3		3/18 (16.5%)
Patients									
Orthopaedic Unit 9/9 (100%)				1	1	1	5	1	2/9 (22%)
Surgical Unit 8/9 (89%)	1		1	1	1		5		3/9 (33%)
Obstetric Unit 3/18 (16%)	15				1		2		1/18 (5.5%)
Medical Unit 7/11 (64%)	4		1	3	1	1	1		5/11 (45%)
Nephrology (on dialysis) 38/50 (76%)	12		5	3	3	4	18	5	11/50 (22%)
Renal Transplanted 28/36 (78%)	8		3	2	4		19		9/36 (25%)
Outpatient renal clinic 14/23 (61%)	9			1	3		9	1	4/23 (17%)

The high exposure rate among anaesthetists may be attributed to the fact that they are involved with the care of ill patients in the intensive care unit where frequent blood sampling and intravenous procedures are frequently resorted to. Pathologists are generally believed to be a high risk group. The one pathologist who showed evidence of exposure carries out post-mortems regularly and does give a history of having been exposed to two strongly positive HBsAg cadavers. The other three pathologists were actually haematologists whose nature of work does not involve exposure to large HBsAg positive tissue surfaces or large amounts and frequent exposures to HBsAg positive blood.

From the above results it would appear that not only must medical and health care staff exercise due care in handling their patients with respect to contracting and transmitting HBV infection but that these staff especially those who belong to category I, II and III must also exercise due care when handling patients with respect to HBV transmission to their patients. That the health care staff have been responsible for the transmission of infection have been reported by several workers (6, 7, 8). Continuous surveillance of patients and staff for HBV infection is therefore necessary and highest quality aseptic technique is fundamental to prevent HBV spread. Failure to do so can result in staff acquiring acute, subclinical or chronic infections - all of which can result in sickness leave and loss of efficiency, apart from the ever present risk of an epidemic that can arise in clinical settings. Control measures in the collection of blood specimens infected with HBV are described in the paper by Welsby (9) and from the paper issued by the Centre for disease control, U.S. Department of health, Education and welfare (10).

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