

East African Medical Vol. 77 No 1 January 2000

HEPATITIS B AND C VIRUS INFECTIONS AND LIVER FUNCTION IN AIDS PATIENT AT CHRIS HANI BARAGWANATH HOSPITAL, JOHANNESBURG

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## HEPATITIS B AND C VIRUS INFECTIONS AND LIVER FUNCTION IN AIDS PATIENTS AT CHRIS HANI BARAGWANATH HOSPITAL, JOHANNESBURG

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### ABSTRACT

**Background:** Impaired liver function tests and co-infection with hepatitis viruses in AIDS patients are common in western countries.

**Objective:** To assess liver function and prevalence of co-infection with hepatitis B and hepatitis C viruses in AIDS patients at Chris Hani Baragwanath Hospital.

**Design:** A prospective study.

**Setting:** Chris Hani Baragwanath Hospital, Johannesburg, South Africa.

**Patients:** One hundred consecutive patients with AIDS admitted to Chris Hani Baragwanath Hospital.

**Results:** There were 52 males and 48 females aged 16 to 54 years (mean + SD: 34.6 + 7.5 years). The results of laboratory test were as follows: LFTs: bilirubin 11.8 (+15.6)  $\mu\text{mol/l}$ ; AST: 79.6 ( $\pm 116.6$ )  $\text{iu/L}$ ; alkaline phosphatase: 204.3 ( $\pm 237.4$ )  $\mu\text{u/L}$ ; albumin: 23.9 ( $\pm 6.2$ )  $\text{g/l}$ ; CD4+ lymphocytes: 141.5 ( $\pm 168.6$ )  $\mu\text{l}$ ; CD8+: 666.9 ( $\pm 618.3$ )  $\mu\text{l}$ ; HBV - HbsAg: 6 (6%); HbsAg + eAg: 3 (3%); previous disease (Anti HBs and/or anti HBc): 35%, HCV: 1(1%). **Conclusion:** Liver function tests were impaired in the majority of patients with AIDS (93%) in our setting. Evidence of previous and present HBV infection was present in 41%. This is different from what is observed in western countries (90-95%). The results also suggest that patients here acquired HBV infection while still immuno competent. HCV infection was rare.

### INTRODUCTION

Both HIV and HBV infections share common modes of transmission, predominantly blood exposure and high risk sexual activity. From studies conducted in western countries, 90-95% of patients with AIDS had serological evidence of present or past HBV infection(1,2). Hepatitis C virus infection is also transmitted by parenteral routes and co-infection with HIV among patients with history of intravenous drug use (IVDU) or blood transfusion are common(3,4). However, it is less clear whether HCV, like HIV is sexually transmitted. Wright *et al*(4) study from San Francisco, California found 11.7% prevalence of HCV/HIV co-infection which could not be accounted for by IVDU or blood transfusion compared to one per cent in the HIV negative patients.

Previous studies in western countries indicate that up to 90% of patients with AIDS had abnormalities of their liver enzymes at presentation(5-10). Aetiological factors were multiple ranging from infections, neoplasms to medications(10). Neither type of enzyme abnormality

could predict a particular infection, neoplasm or drug use(8,11).

Between 12 and 35% of South Africans are infected with HIV and between 40 and 60% of admissions in medical wards in State hospitals have HIV-infection(12). From available statistics here, it has been observed that 40% of our HIV patients have impaired liver transaminases. Reports from the National Institute of Virology of South Africa, also show that eight to fifteen per cent of South African blacks are HBV carriers (HbsAg positive) and three to five per cent have antibodies to HCV(12).

Against this background, we set out to determine the prevalence of HBV and HCV serological markers as well as the evaluation of liver function and T cell lymphocyte subsets (CD4+/CD8+) in AIDS patients admitted to CHB Hospital.

### MATERIALS AND METHODS

One hundred consecutive patients with serologic evidence of HIV-infection who fulfilled the 1993 revised classification system for HIV-infection and the expanded AIDS surveillance

**Table 1***Liver function tests, globulins and T cell subsets*

	Bilirubin			Liver function tests Serum enzymes				Serum proteins			T cell Subsets	
	Total µmoi/L	Direct µmol/L	Indirect µmol/L	AST lu.L	ALT iu.L	ALK Phosp lu/L	GGT lu/L	Total g/L	ALB g/L	GLOs g/L	CD4+ mm <sup>3</sup>	CD8+ mm <sup>3</sup>
Mean	11.8	5.99	5.8	79.6	44.6	204.3	105.5	78.7	23.9	55.1	141.6	666.9
SD	15.6	21.1	4.5	116.6	72.6	237.4	119.6	15.6	6.2	14.6	168.6	618.3
Normal values	5.1-17	1.7-5.1	3.4-12	0-35	0-35	3.0-120	7-40	55-80	32-52	20-35	500-2010	250-990
% with abnormal results	14%			66%	36%	56%	78%	44%	86%	93%		

**Table 2***Hepatitis B virus and hepatitis C serological markers*

Serological Markers	Hepatitis B virus markers HCV				
	HbsAg	Anti HBs	HBeAg	Anti HBc	Anti HCV
No	6	35	3	41	1
% of total	6	35	3	41	1

case definition for adolescents and adults (13) criteria for AIDS, admitted to the medical wards in CHB Hospital in May 1999. Informed consent was obtained from the patients. The following tests were carried out: (i) liver function tests, namely, alkaline aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (Alk Phosph), gamma glutamyl transferase (GGT), bilirubin levels, serum albumin and total serum proteins, using standard routine spectrophotometric methodology; (ii) T lymphocyte subsets CD4+ and CD8+ using flow cytometry; (iii) hepatitis B virus markers: hepatitis B surface antigen (HbsAg), hepatitis e antigen (HBeAg), hepatitis B surface antibody (Anti HBs), hepatitis B core antibody (Anti HBc) using Abbott's diagnostic kits and; (iv) hepatitis C virus antibody (Anti HCV) using standard third generation ELISA kits.

## RESULTS

Fifty two males and 48 females were studied. The age range was 16 to 54 years (Mean  $\pm$  SD; 34.6  $\pm$  7.5 years). The liver function tests, serum proteins and T cell subset counts are as shown in Table 1. Ninety seven per cent of patients had elevated globulin and/or reduced serum albumin, 70% had elevated AST and/or ALT and 78% had elevated GGT. CD4+ counts were generally low and CD8+ lymphocyte counts were within or above the normal levels in the majority of

patients. The liver enzymes suggest there was a preponderance towards hepatobiliary obstruction relative to hepatocyte injury. Table 2 shows the prevalence of HBV and HCV serological markers in our study population. The overall prevalence of present and past HBV viral infection was 41%, with six patients carriers of HbsAg and three positive for HBeAg. Hepatitis C virus antibodies were rare (one per cent). None of the patients had been vaccinated against HBV.

## DISCUSSION

HIV, HBV and HCV share common modes of transmission, namely, blood exposure for all high risk sexual behaviour for HIV and HBV. The role of high risk sexual behaviour in HCV transmission is controversial. Our results show that HBV/HIV co-infection (41 %) is not as common as the western series of 90-95% (1,4,11) and HCV/HIV co-infection of one per cent much lower than the 11.7% found by Wright *et al*(4) in patients without a history of intravenous drug use. Fifteen per cent of those who had HBV-infection developed a HbsAg chronic carrier state and 50% of those with HbsAg had HBeAg. This compares well with ten per cent HbsAg carrier rate and 66% of HBeAg positivity in those with HbsAg found by Rustgi *et al*(2). None of the patients with HbsAg had elevated bilirubin, two had slight elevation of AST, one ALT

and one, both ALT and AST were minimally elevated. These findings also concur with those of Rustgi(2). The serological results suggest that most of the patients who developed HBV infection did so when they were still immunocompetent. Patients with immunodeficiency syndromes or those who are exogenously immunosuppressed are at an increased risk of developing the chronic HBsAg carrier state as shown among patients on renal dialysis who develop an HBV carrier rate of 60-90%(14). If these patients had developed HBV after developing immunodeficiency, a higher percentage might be expected to become chronic HBsAg carriers. The percentage of patients who were HBsAg carriers (six out of 41) is characteristic of the percentage of young adults infected with this virus who develop the chronic carrier state(15 - 16). During the course of HIV infection, the liver and the biliary tract often get affected with opportunistic infections, neoplasms or effect of drug therapy used in treatment(911). Ninety six per cent of our patients had a reduced serum albumin and/or an elevated globulin levels. At least one of the serum enzyme levels was elevated in 88% of the cases: GGT in 78%, AST and/or ALT in 70% and alkaline phosphatase in 56% of the cases. These high enzyme levels were more frequent than in previous studies(5-9). This could be due to the fact that most of our patients were in more advanced stages of their disease (CD4+ count  $141.5 \pm 158.6/\text{mm}^3$ ). In the past, it was felt that in patients with AIDS or even early stages of HIV, chronic viral hepatitis was not likely to affect life expectancy or to cause a significant number of complications. However, as our ability to treat HIV infection improves, hepatitis viruses may emerge as important pathogens in patients with HIV infection. In conclusion, most of the patients evaluated were in advanced stages of AIDS and had impaired liver function tests. Evidence of past and present HBV infection was present in 41% of the patients. This is in contrast to the high levels observed in western countries. However, the HBsAg carrier rate in our study was similar to that observed in western countries. The results suggest that AIDS patients in Soweto and in western countries acquired HBV infection while still immunocompetent. HCV infection was rare being, one per cent compared with 11.7% found in the USA. This suggests that in our group of patients sexual transmission of HCV is not a major factor.

#### ACKNOWLEDGEMENTS

We wish thank the following: The patients who voluntarily agreed to participate in the study; Sunette Roos for secretarial services; H. Hassan and the rest of the laboratory staff for laboratory tests; Nursing staff in the medical wards of Chris Hani Baragwanath Hospital.

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