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N.K.D. Halim, MBChB, FMCPATH (Nig). Senior Lecturer/Consultant Haematologist, Department of Haematology, Madukwe, BDS, MSc, Lecturer,  
B.D.O. Saheeb, BDS, FWACS, FRCSI, Senior Lecturer, Department of Oral and Maxillofacial Surgery, L.U. Airauhi, AIMLS, MSc, PhD, Lecturer,  
Department of Medical Microbiology, College of Medical Sciences, University of Benin, Nigeria.

Request for reprints to: Dr. N.K.D. Halim, Department of Haematology, College of Medicine, University of Benin, PMB 1154, Benin City, Nigeria.

## HEPATITIS B SURFACE ANTIGEN AND ANTIBODY TO HEPATITIS C VIRUS AMONG ACCIDENT AND EMERGENCY PATIENTS

N.K.D. HALIM, MADUKWE, B.D.O. SAHEEB and L.U. AIRAUHI

### ABSTRACT

**Objective:** To determine the sero-prevalence and epidemiology of antibody to hepatitis C virus (anti-HCV) and hepatitis B surface antigen in accident and emergency patients.

**Design:** A descriptive study was performed on 150 accident and emergency patients. Sera was screened for anti-HCV and HbsAg, using enzyme linked immunosorbent assay. Personal information and risk factors involved were obtained using a questionnaire.

**Setting:** Haematology laboratory of the University of Benin Teaching Hospital, Nigeria.

**Subjects:** One hundred and fifty adults consisting of 122 males and 28 females who were above the age of 21 years. Patients were randomly selected from all adults including dental patients attending the emergency department for both surgical, dental and medical emergencies. The age range was between 21 - 58 years. In order to ascertain the epidemiology of both viruses a questionnaire was used detailing the possible risk factors for transmission. These included history of previous blood transfusion; history of life time occurrence of multiple sexually transmitted diseases; history of heterosexual exposure to partners at risk (for example prostitutes); history involving the use of unsterilised blades; presence of scarification marks and tattooing; low socio-economic status (low annual income or unemployed); history of intravenous drug use and heterosexual activity. Anti-HCV and HBsAg were both assayed using different assay kits, based on the enzyme linked immunosorbent assay (ELISA) tests from different manufacturers.

**Results:** The sero-prevalence of anti-HCV was 14% and 29.3% for HBsAg. Anti-HCV positivity was significantly associated with a past history of blood transfusion and heterosexual exposure to partners at risk. The study also revealed a significant association between HBsAg positivity and all the risk factors.

**Conclusion:** The high prevalence rate for anti-HCV and HbsAg in accident and emergency patients increases the likelihood of further spread from patients to health care providers especially if adequate precautions are not observed.

### INTRODUCTION

Hepatitis B virus and hepatitis C virus have been implicated in the aetiology of chronic hepatitis and hepatocellular carcinoma(1-3). Both viruses share similar risk factors for transmission which have been highlighted(4). Previous studies in this environment by Abiodun *et al*(5) revealed a prevalence rate of 10.4% HBsAg in a normal adult population and 26% in a study by Halim *et al*(6) in blood donors. A recent study(7) by the latter author revealed a 12.3% prevalence for anti-HCV in blood donors.

Various prevalence rates have been reported elsewhere for anti-HCV antibodies and HBsAg among populations at risk(8-11). However, there appears to be no report on

accident and emergency patients in our environment; in contrast, Kelen *et al*(4) in a study in the United States of America, revealed a prevalence of 18% for anti-HCV and 5% for HBsAg in emergency department patients. Due to the similarities in the mode of transmission of both viruses especially in emergency patients, we have attempted to document the inter-relationship between both viruses in accident and emergency patients; as they form a cross-section of the community, and have been exposed to some of the risk factors involved in the transmission of HCV and HBsAg.

### MATERIALS AND METHODS

One hundred and fifty adults comprising 122 males and 28 females consecutively attending the accident and emergency

department of the University of Benin Teaching Hospital between July and November 1995 were screened for both anti-HCV and HBsAg. All categories of patients, irrespective of type of ailment and who were aged 21 years and above were included. The age range was 21-58 years. A questionnaire detailing the various modes of transmission was used to obtain relevant information such as receipt of previous blood products, history of heterosexual exposure to partners at risk: life time history of more than two sexually transmitted diseases: history of scarification and tattooing: sharing of used blades for shaving; barbing and manicure of nails: history of intravenous drug abuse and history of homosexual activity.

Blood samples were obtained from patients after verbal consent and samples were tested for HBsAg by enzyme linked immuno-absorbent assay (ELISA) kits (Murex diagnostics, Daltford England). A repeat ELISA test was performed on each positive HBsAg sample. in order to eliminate false positivity. Results were regarded as positive after a repeat positive ELISA test. For anti-HCV, the test was performed using the anti-HCV enzyme linked immuno-absorbent assay (ELISA) kits (Ortho-diagnostics Ranitau. New Jersey, USA). A repeat ELISA test was performed on each positive anti-HCV sample. This was regarded as positive after a repeat positive ELISA test.

The results were subjected to statistical analysis using an SAS software package. Methods used included the Student's t-test for comparing means and univariate analysis of risk factors, for the seroprevalence of anti-HCV and HBsAg.

## RESULTS

The sero-prevalence of anti-HCV was 14% (21 out of 150 patients) while the sero-prevalence of HBsAg was 29.3% (44 out of 150 patients (Table 1).

**Table 1**

*Prevalence of HCV and HBsAg among emergency department patients*

Sex	No.	Anti-HCV positive	HBsAg positive
Male	122	18	37
Female	28	3	7
Total	150	20 (14%)	44 (29.3%)

**Table 2**

*Age range for antibody to HCV and HBsAg (emergency department patients)*

Age range	Anti-HCV positive	HBsAg positive
20-30	6	26**
31-40	14*	8
41-50	1	6
51-60	0	4
Total	21	44

\*P=0.001, age group 31-40 years for anti-HCV positive, when compared to the other age groups

\*\*P=0.001, age group 20-30 years for HBsAg positive, when compared to the other age groups.

Table 2 shows the age range for antibody to HCV and HBsAg positivity. The age range of 31-40 years had a sero-prevalence of 14% for anti-HCV compared to 6%, 1% and 0% for the 20-30, 41-50 and 51-60 years age groups respectively. This value was statistically significant ( $p<0.001$ ). The age range of 20-30 years had the highest figure of 26% for HBsAg which was statistically significant ( $p<0.001$ ), when compared to a figure of eight, six and four obtained for the 31-40, 41-50 and 51-60 years age groups.

Table 3 shows the prevalence of the various modes of transmission. A past history of receipt of blood products accounted for 57.1% (12 out of 21 anti-HCV positives), subsequently followed by heterosexual exposure to partners at risk 42.8% (9 out of 21 anti-HCV positives), history of sexually transmitted diseases within the past 6 months accounted for 42.8% (nine out of 21 anti-HCV positives), history of poor socio-economic status (eight out of 21 anti-HCV positives). history of sacrifice and tattooing 9.5% (2 out of 21 anti-HCV positives); and history of use of unsterilised blades accounted for 4.7% (1 out of 21 anti-HCV positives).

**Table 3**

*Description of the various modes of transmission*

Mode of transmission	anti-HCV positive (n=21) n(%)	HBsAg positive (n=44) n(%)
Receipt of blood products	12 (57.1)	17 (38.6)
Heterosexual exposure to partners at risk	9 (42.8)	21 (47.7)
Lifetime history of sexually transmitted disease	9 (42.8)	20 (45.4)
Less than average socio-economic status	8 (21)	13 (29.5)
History of sacrifice and tattooing	2 (9.5)	5 (11.3)
Unsterilised blades	1 (4.7)	8 (5.5)

( ) = Percentage positive

For HBsAg positive patients, receipt of blood products accounted for 38.6% (17 out of 44 HBsAg positives); heterosexual exposure to partners at risk accounted for 47.7% (21 out of 44 HBsAg positives); history of sexually transmitted disease within the past six months accounted for 5.5% (13 out of 44 HBsAg positives): history of sacrifice and tattooing accounted for 11.3% (five out of 44 HBsAg positives): and the use of unsterilised blades accounted for 5.5% (eight out of 44 HBsAg positives). The odds ratio, confidence intervals and P values for the various risk factors for antibody to HCV and HBsAg are shown in Table 4.

Logistic regression analysis revealed the risk of anti-HCV positivity was independently associated with receipt of blood products (odds ratio 0.08, 95% CI 0.04-0.11,  $p=0.001$ ) and heterosexual exposure to partners at risk (odds ratio 3.18, 95% CI 1.66-6.11;  $P=0.0001$ ). There was no significant association with other risk factors. Logistic

Table 4

Risk factors for HCV and HBV infection (all patients)

Risk factor	Anti-HCV, Odd's ratio 95% confidence interval P value		HBsAg, Odd's ratio 95% confidence interval P value	
	Receipt of blood products vs nil history of blood products	0.08 (0.04-0.11)	0.001	3.17 (1.56-5.08)
Heterosexual exposure to partners at risk vs nil partners at risk	3.18 (1.66-6.11)	0.0001	4.32 (2.13-9.23)	0.0001
Life time history of two STDs versus nil history of STDs	0.66 (0.38-1.18)	0.16	1.14 (1.42-4.09)	0.0001
Less than average socio-economic status vs average and above, socio-economic status	1.74 (0.76-3.95)	0.13	20.2 (11.41-43.61)	0.001
Unsterilized blades vs nil use of unsterilised blades	1.62 (0.67-3.77)	0.27	1.06 (1.05-1.09)	0.001
Scarification and tattooing vs nil scarification and tattooing	1.05 (0.02-2.38)	0.42	2.82 (1.03-4.26)	0.001

regression analysis of our results, showed that increased risk of HBsAg positivity was independently associated with receipt of blood products (odds ratio 3.17, 95% CI 1.56-5.08;  $p=0.001$ ); heterosexual exposure to partners at risk (odds ratio 4.32, 95% CI 1.42-4.09;  $p=0.0001$ ); lower socio-economic status (odds ratio 20.2 95% CI 11.4-32.61;  $p=0.001$ ) use of unsterilised blades (odds ratio 1.06, 95% CI 1.05-1.09;  $p=0.001$ ) and presence of scarification (odds ratio 2.82, 95% CI 1.03-4.26;  $p=0.001$ ).

## DISCUSSION

The results of our study reveal, a prevalence rate of 14% for anti-HCV and 29.3% for HBsAg in accident and emergency patients. Both figures are high and slightly higher than figures of 12.3% and 26% for anti-HCV and HBsAg obtained in previous studies on normal blood donors in our environment(6,7).

The majority of patients with either anti-HCV antibody or HBsAg were within the twenty to forty-year age group. This age group has a higher sexual inclination or level of promiscuity and this could readily account for the high frequency. The tendency for infection in this age group has been corroborated in previous studies(4,6,8). We found the highest prevalence of anti-HCV antibody(57.1%) in patients with a past history of receipt of blood products and patients with a history of sexual exposure to partners at risk (42.8%). These findings are corroborated in previous studies(10,11,13).

Heterosexual exposure to partners at risk (47.7%) accounted for the highest prevalence in HBsAg patients. The finding of HBsAg positive, was significantly associated with all the risk factors highlighted. The significant association of HBsAg positivity and heterosexual exposure to partners at risk has been highlighted in previous studies(14). Partners at risk in this study were predominantly prostitutes. There were no partners with a history of drug abuse or symptoms suggestive of hepatitis or prior blood transfusion. Comparison of risk factors between anti-HCV and HBsAg revealed a greater association of HBsAg with the known risk factors. This may be due to the higher rate of infectivity of hepatitis B virus when patients are exposed to any of the risk factors.

We also observed an association between a low-socio-economic status and HBsAg positivity; which was significant. Low socio-economic status increases the likelihood of HBsAg positivity, by way of enhancing household contacts and intra family spread. On the contrary, the study did not show a significant association between anti-HCV positivity and low socio-economic status. We wish to postulate that a low socio-economic status appears to play a greater role in HBsAg positivity compared to anti-HCV positivity in this environment. Similarly, we wish to draw the same conclusion as regards the use of unsterilised blades; the presence of scarification marks and a lifetime history of multiple sexually transmitted disease.

The high prevalence rate of anti-HCV and HBsAg observed in this study, exposes the unvaccinated health care providers to the acquisition of hepatitis B virus and hepatitis C virus. We wish to recommend HBV vaccination for all emergency department staff, as in developed countries. This would reduce the spread of hepatitis B virus. We also wish to stress the need for universal precaution by health care providers especially in emergency department. Finally, routine HBsAg and anti-HCV screening of emergency patients prior to surgery would identify patients with either virus and would enable necessary precautions to be adopted by emergency department staff.

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## SCIENTIFIC LETTER

Dear Sir,

### INCIDENTAL MUCINOUS CYSTADENOCARCINOMA OF THE APPENDIX WITH PSEUDOMYXOMA PERITONI IN A DIABETIC WITH HYPOGLYCAEMIC COMA

Mucinous cystadenocarcinoma of the appendix with pseudomyxoma peritoni is a rare slowly progressive disease(1). Suspected appendicitis is the commonest presentation. In women, the diagnosis was most commonly made while being evaluated for ovarian cancer or for increased abdominal girth(2).

A G F, a 65-year old lady, was admitted to Khartoum Teaching Hospital casualty with hypoglycaemic coma. She was a known diabetic and on glibenclamide 5 mg/day. Further examination following recovery revealed a distended abdomen with a mass occupying the upper abdomen. Ultrasound examination reported a suspicion of pseudomyxoma peritoni. At laparotomy, a copious gelatinous fluid was scooped out, the appendix was a thick granular mass. All organs were studded with granular material and the omentum had turned into honey wax material which was debulked. Only the appendix was removed as it was technically impossible to do right hemicolectomy. The patient had uneventful recovery. Histopathology showed mucinous cytsadenocarcinoma of the appendix. On retrospect, the patient admitted having poor appetite within the previous few weeks while continuing her oral hypoglycaemic treatment.

Post-operatively, she received systemic chemotherapy with good response. Pseudomyxoma peritoni is an unusual condition in which gelatinous fluid collections are associated with mucinous implants on the peritoneal surfaces and omentum(3). The primary cause ranges from a mucinous neoplasm of the appendix, a mucous producing gastrointestinal adenocarcinoma, a primary ovarian mucinous tumour or as a secondary to an unknown primary. To our knowledge, an association of mucinous cystadenocarcinoma of the appendix with diabetic hypoglycaemic has not been reported before. The presenting hypoglycaemic coma in our patient was induced by the poor appetite the patient experienced recently. This was possibly due to abdominal distension and the huge omental mass pressing on the stomach.

Incidental findings of an appendicular tumour without pseudomyxoma peritoni during laparotomy had been reported(4).

It is recommended that such patients undergo right hemicolectomy although its superiority to appendectomy alone has not been definitely proven(5,6). Cytoreductive surgery combined with peritonectomy and peri-operative intraperitoneal and post-operative chemotherapy has been employed with success(2). However, recurrence is common with a five-year survival rate of 53% to 75% depending on histopathology(3).

E. N. O. Ahmed, MBBS, Khartoum Teaching Hospital and M. E. Ahmed, MS, FRCSI, Department of Surgery, Faculty of Medicine, University of Khartoum, P.O. Box 102, Khartoum, Sudan.

Request for reprints to: Dr. E.N.O. Ahmed, c/o M. E. Ahmed, Department of Surgery, Faculty of Medicine, P.O. Box 102, University of Khartoum, Khartoum, Sudan.

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