

Risk Factors For Hepatitis B Virus Transmission In Nigerians: A Case-Control Study

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Abstract

This was a case-control study carried out at gastroenterology unit of the University of Nigeria Teaching Hospital (UNTH) Ituku/Ozalla from January 2008 to April 2010. The cases were consecutive patients with various forms of liver disease who tested positive for Hepatitis B surface (HBsAg). Asymptomatic individuals referred to the unit during the study period after testing positive for HBsAg during screening for blood donation or routine medical examination were also included as cases. The control subjects were age and sex-matched, HBsAg- negative individuals referred for upper gastrointestinal endoscopy. This case-control study of adults with HBV infection revealed that several high risk behaviors and practices for the transmission of this infection are significantly more prevalent among the patients compared to the controls. This means that parenteral transmission of HBV through these high-risk activities may have substantial contribution to disease burden.

INTRODUCTION

Hepatitis B virus (HBV) infection remains a major global public health challenge. About 2 billion people (which translates to a third of the world population) have been infected with HBV and majority of these people live in South-East Asia, Far East and sub-Saharan Africa. About 350 million people are chronically infected and close to 2 million people with chronic infection die annually(1).

Regions of the world that have a prevalence of 8% or more are classified as highly endemic areas(1-4), and Nigeria happens to be in this group. The modes of transmission include parenteral (exposure to blood or blood products), unprotected sex (heterosexual and homosexual), materno-fetal (vertical) and horizontal (exposure to chronically infected household members or child to child). In highly endemic settings perinatal and horizontal routes are responsible for most disease transmission(2-4). Early childhood (horizontal) transmission is particularly important in sub-Saharan Africa, Alaska and Mediterranean countries, where, in contrast to Asia, perinatal transmission is less common (5). Added to this are ignorance and poverty which directly or indirectly impact negatively on the spread of the infection. It is possible that those with chronic infection still transmit the virus through high risk behaviors and practices.

Global efforts at disease prevention and control have produced satisfactory results in some countries of the world.

In Taiwan, for instance, the disease burden has been reduced considerably with the use of immunization(6). Hepatitis B vaccine was effectively incorporated in the Nigerian National programme on immunization less than 10 years ago and therefore its effect, if any is likely to be seen in children and not adults.

This study was carried out to determine the prevalence of selected risk factors among patients with HBV-related liver disease.

PATIENTS AND METHODS

This was a case-control study carried out at gastroenterology unit of the University of Nigeria Teaching Hospital (UNTH) Ituku/Ozalla from January 2008 to April 2010. The cases were consecutive patients with various forms of liver disease who tested positive for Hepatitis B surface (HBsAg). Asymptomatic individuals referred to the unit during the study period after testing positive for HBsAg during screening for blood donation or routine medical examination were also included as cases. The control subjects were age and sex-matched, HBsAg- negative individuals referred for upper gastrointestinal endoscopy.

The protocol was approved by the UNTH research ethics committee and informed consent was obtained from all the participants. A structured questionnaire was administered to each participant. The questionnaire contained questions on

the putative modes of transmission and high risk practices and behaviors. The results were analyzed with the computer software SPSS version 15 and were expressed as means and proportions. Differences between means and proportions were determined and a P value of <0.05 was considered statistically significant.

RESULTS

There were 202 patients with different forms of liver disease related to HBV, made up of 160 males (79.2%) and 42 females (20.8%). The mean age of the patients was 39.79±14.78 years. The spectrum of HBV-related liver disease was as follows: acute hepatitis 2 patients (1%), asymptomatic infection 80 patients (40%), chronic hepatitis 6 patients (3%), cirrhosis 48 patients (23.8%) and hepatocellular carcinoma 65 patients (31.7%)

Figure 1

TABLE 1. Distribution of HBV-related liver disease (n = 202)

LIVER DISEASE	NUMBER OF PATIENTS	PERCENTAGE (%)
Acute Hepatitis	3	1.5
Asymptomatic Infection	80	39.6
Chronic Hepatitis	6	3.0
Cirrhosis	48	23.8
Hepatocellular Carcinoma	65	32.2
TOTAL	202	100

Risk factors for HBV infection included injections from medical quacks (48.0%), multiple sexual partners (38.7%), scarification/tribal marks (31.6%), sharing of sharp instruments like razor blades and clippers (26.6%), sharing of toothbrush (23.7%), and past history of native uvulectomy (23.7%). Others were past history of jaundice (18.8%), family history of liver disease (18.6%), past history of blood transfusion (9.1%), occupational exposure (5.3%) and intravenous drug use (4.4%).

There were 198 control subjects made up of 119 males (60%) and 79 females (40%). The

mean age of the control subjects was 37.54±14.34 years. The difference between the mean age of the patients (39.79±14.78 years) and the mean age of the control subjects (37.54±14.34) was not statistically significant (P = 0.9443). Past history of jaundice was obtained in 38 patients and in 20 control subjects. The difference between the proportions was statistically significant (P=0.0323). Ninety four patients received injections from medical quacks while Only 51 control subjects received injections from similar sources. The difference was statistically significant (P=0.0024). Family history of liver disease and use of scarification/tribal

marks were significantly more prevalent in the patients (P<0.0001 and 0.038 respectively). Sharing of sharp instruments was more common among the cases compared to the controls (31.6% vs 19.3%). The difference was statistically significant (P=0.038). There was no difference between the patients and control subjects with respect to past history of blood transfusion, intravenous drug use, multiple sexual partners and occupational exposure. However, there were more patients with past history of native “uvulectomy” compared to the control subjects (P=0.0001). Similarly, sharing of toothbrush was more common among the patients compared to the control subjects (P=0.0001). Table 2 shows a comparison between the patients and control subjects with respect to the risk factors and high risk behaviors and practices.

Figure 2

TABLE 2. Comparisons Between Patients with HBV-related liver disease (cases) and control subjects

RISK FACTOR	CASES	CONTROLS	χ	P VALUE
Injection from quacks	94(n=196)	51(n=195)	9.204	0.0024*
Multiple sexual partners	58(n=150)	32(n=129)	3.157	0.0756
Scarification/tribal marks	62(n=196)	38(n=193)	4.305	0.038*
Sharing of sharp instruments	61(n=195)	37(n=192)	4.305	0.038*
Sharing of toothbrush	44(n=195)	13(n=189)	15.13	0.0001*
Uvulectomy	44(n=186)	13(n=189)	15.13	0.0001*
History of jaundice	38(n=200)	20(n=198)	4.58	0.0323*
Family history of liver disease	36(n=194)	7(n=189)	17.02	<0.0001*
Blood transfusion	18(n=198)	10(n=190)	1.838	0.1752
Occupational exposure	10(n=190)	3(n=185)	3.468	0.0626
Intravenous drug abuse	8(n=182)	3(n=187)	2.34	0.1261

* statistically significant

DISCUSSION

This case-control study of adults with HBV infection revealed that several high risk behaviors and practices for the transmission of this infection are significantly more prevalent among the patients compared to the controls. This means that parenteral transmission of HBV through these high-risk activities may have substantial contribution to disease burden. This is in addition to the long established predominant epidemiologic pattern in areas of high endemicity like Nigeria where vertical and horizontal (child to child) transmissions are the rule. There is thus a semblance of “double trouble” situation in this area with implications for greater viral transmission and higher disease burden.

Nearly half of the patients with various forms of HBV-

related liver disease gave history of having received injections from medical quacks whereas only 26.2% of the control subjects had similar history. In developing countries, exposure to contaminated therapeutic injection equipment are common in many settings because of lack of awareness of infection control practices, lack of resources for sterilization and the purchase of new disposable equipment, and economic incentives and cultural preferences favoring overuse of injections. Contaminated injections caused an estimated 21 million HBV infections worldwide in 2000, accounting for 32% of all new infections(7).

Sharing of sharp body-piercing instruments such as razor blades and hair clippers is another risk factor which was demonstrated in this study. The practice was significantly more prevalent among the cases compared to the controls. This unhealthy practice can be considerably reduced by mounting health education campaigns in order to educate the populace on the routes of transmission of HBV and how to control its spread.

Similarly, scarification/tribal marks were found to be more prevalent among the cases compared to the controls. Sometimes these practices are carried out by ignorant persons who do not give any consideration to any of the principles of universal precautions. Again health education will be a potent tool to reduce this health hazard.

Sharing of tooth brush among household members and friends was more common among the cases compared to the controls. This practice was noted in 23.7% of the cases but in only 6.9% of the control subjects. The chance of transmitting the virus through this route is likely to be substantial given the fact that such sharing is likely to occur over prolonged periods.

Uvelectomy is practiced in Nigerian communities as treatment for sore throat .It is usually carried out by local healers in very unhygienic environments without sterilization of instruments. Among the cases, 23.7% had undergone this procedure in their lifetime compared to 6.9% in controls. The procedure carries other risks like bleeding, anemia, sepsis, transmission of other pathogens including HIV, tetanus and death (8). An earlier study in Jos, Nigeria did not show any association between Hepatitis B surface antigenemia and some socio-cultural factors including uvulectomy(9). This discrepancy may be explained by the fact that the latter study was carried out on children who had not grown old enough to either have an indication for uvulectomy let alone being able to withstand the cruel

procedure which is usually performed without anaesthesia.

There were more instances of family history of liver disease among the cases compared to the controls. Hepatitis B Virus infection has long been recognized to exhibit familial clustering. This has been shown to result from mother to child and horizontal transmission among siblings and household members (10-12).

History of blood transfusion, occupational exposure and intravenous drug abuse did not contribute significantly to HBV transmission in this study. This finding is similar to what was documented in previous studies across Nigeria (13-15). However, history of multiple sexual partners (MSP) was obtained in 38.7% of the cases and 24.8% of controls. This difference was not statistically significant but the observation may be an important one, considering the role of this high risk behavior in the transmission of other infections like HIV. People are usually reluctant to discuss their sexual relationships and when they do, the reliability of the information volunteered or obtained is questionable. A study in Nassarawa State of Nigeria on HBV among female sex workers showed a sero-prevalence (HBsAg) of 17.1%(16).

In conclusion, there appears to be a mixed picture in Nigerian patients with HBV infection. In addition to the high rate of vertical transmission and childhood (horizontal) transmission which are the long established modes in high endemicity areas of the world, there is a great contribution to the burden of disease by numerous high risk behaviors and practices prevalent in adult Nigerians. This “double trouble” scenario is a big challenge that requires a multi-faceted management and control strategy.

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