

HEPATITIS B ANTIGENAEMIA (HbsAg): RISK OF OCCUPATIONAL EXPOSURE IN A CHEMICAL PATHOLOGY LABORATORY IN NIGERIA

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ABSTRACT

The prevalence of Hepatitis B. surface Antigen (Hbs Ag) is high in subsaharan Africa, Nigeria inclusive. We set out to apses the risk of occupational exposure to Hepatitis B virus (HBV) infection in medical laboratory workers in Nigeria by screening 200 consecutive serum samples processed over a two week period at the Chemical Pathology laboratory of the University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria. The Accustep HbsAg. Rapid test kit USA was used. Twenty nine (14.5%) of all the samples screened tested positive. For the adults, the seropositivity rate was 15.3%, while it was 12.5% for children/adult?.

The implications of these findings are discussed, especially with regards to the risk of occupational exposure of laboratory and health workers. The provision of appropriate laboratory safety measures and regulations, and compliance with these are emphasized, especially in this environment.

KEYS WORDS: Hepatitis B virus, risk, occupational exposure, laboratory workers, Nigeria.

INTRODUCTION

Hepatitis B virus (HBV) has a worldwide distribution and is of great medical importance because it may be the most common cause of chronic liver disease including hepatocellular carcinoma in man. Globally, it is estimated that 300-350 million individuals are chronic carriers of the HBV, and about 1.5 million people die annually from HBV infection¹. The high prevalence rate with its sequelae, such as cirrhosis of the liver and hepatocellular carcinoma, make HBV infection a disease of major public health importance worldwide^{2,5}.

HBV infection is highly endemic in Nigeria^{6,7} and it is estimated that about 12% of the total population of Nigeria are chronic carriers of HbsAg^{8,9}. Various studies from different parts of Nigeria have reported prevalence among selected groups^{8,10-16}, but we are unaware of any that has addressed the risk of occupational exposure in a specific cohort.

Our recent study in Port Harcourt, Nigeria, of the risk of occupational exposure to HIV infection (8.1% among medical laboratory workers¹⁷) jolted us to the realization that HBV, being more prevalent, may pose a higher risk too. Our recent finding showed that HBV carrier rate in port Harcourt is high, being 28.4% among patients¹⁸. Hence we embarked on this study to ascertain the true position at the University of Port Harcourt Teaching Hospital where there is a background of poor awareness of laboratory safety measures and paucity of laboratory safety equipment or gadgets in clinical laboratories, as is the case in most of sub-Saharan Africa.

PATIENTS AND METHODS

Two hundred (200) consecutive serum samples from specimens submitted by patients for routine biochemical investigations were collected over a two-week period in

October 2001. Care was taken to include only the serum samples from specimens which had sufficient remnant volume after all test requests had been done.

For the screening method, Accustep HBsAg Rapid test kit (by AccuDX inc. San Diego, USA) was used. This is ELISA-based and has a sensitivity of 0.5ng/ml with high specificity for HBsAg and does not react with other hepatitis viral agents such as hepatitis A and C.

RESULTS

Two hundred (200) consecutive serum samples were screened out of which 112 (56.0%) were males and 88 (44.0%) were females.

Samples from adults (≥ 15 years of age) were 144 (72.0%), while those from children (< 15 years of age) were 56 (28.0%).

Of the total number (200) of serum samples screened, 29 (14.5%) tested positive, and comprised of 18 males (14 adults and 4 children). And 11 females (8 adults and 3 children). Among the 29 seropositivity cases were 22 adults (76%) and 7 children (24%). This gives a seropositivity rate of 15.3% for all adult samples. For the children, the overall seropositivity rate was 12.5%.

DISCUSSION

Our result of 14.5% overall seropositivity rate confirms the high seroprevalence rate of HBV in Nigeria and sub-Saharan Africa. This also corroborates our earlier finding in Port Harcourt of a high prevalence rate of HBV of 28.4% among patients with a high clinical index of suspicion¹⁸.

The results clearly highlight a high occupational exposure risk of health workers, especially the laboratory workers, to HBV infection. This risk of 14.5% exposure rate is in agrees with our earlier suspicion, and also higher than that for HIV infection, which we found to be 8.1%¹⁷ for the same environment under study. But unfortunately, the raging

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publicity, concern and commitment of governments, non-governmental organizations (NGOs), and researchers, have relegated the attention to HBV infection and its treatment and prevention to the background. This gives a false sense of safety from HBV infection.

The problems of HBV infection are compounded by the fact that little or no safety measures are put in place in clinical laboratories in sub-Saharan Africa. This may be due largely to underfunding of health institutions. Only few countries in the sub-region meet WHO recommendation for statutory allocation of funds from nations budget to health. Therefore, in the absence of the relevant safety facilities, regulations for laboratory safety measure are not enforced. For example, the use of protective laboratory wears is rare, month pipetting still exists in some places, and venepunctures are done without mandatory use of hand gloves. Venepuncture procedure is particularly more hazardous with children where, because of fear the procedure is usually accompanied or associated with some struggle, shaving of scalp, many unsuccessful punctures and inadvertent extravasation or spilling of blood before an adequate sample volume can be obtained.

Unlike in the developed countries, hazardous samples are not usually properly identified by clinical staff collecting the samples by way of labeling, flagging, etc, nor are they transported in sealed, leak-proof, transparent, plastic bags to the laboratory. Therefore, laboratory staff, on receiving these samples are quite unaware of the hazardous ones to warn them to take extra-safety measures, apart from the general principle of treating every samples as potentially hazardous. In this study, none of the samples sent to the laboratory was flagged or giving any mark of identification as HBV position sample, even when they were coming from known high risk patient groups. The clinical staff themselves might not have known that the patients concerned were HBsAg positive. The laboratory request forms for the patients bore various information such as : fever, heart failure, leg ulcers, generalized lymphadenopathy, neonatal jaundice, diabetes mellitus, hypertension, septicaemia, hepatitis, sickle cell disease, road traffic accident, gastroenteritis, routine cheek, neuropathy, hepatic renal failure, prostatic tumour, chronic liver disease, rheumatoid arthritis, intestinal obstruction, chronic renal failure, prostatic etc. So not many cases had a provisional diagnosis suggestive of possible HBV infection. Some request forms had no clinical information to guide laboratory staff. Therefore, laboratory staff are handicapped in trying to identify specimens that who clean up laboratory desk, glass wares and spillages with little or no protective wares.

The risk of viral transmission with injury from infected source has been estimated as follows^{1,9}.

SOURCE	RISK
HBV(unvaccinated)	
- Source HBeAg+ve	= 37-62%
- Source HBeAg-ve	= 23-37%
HCV.....	= 1.8%
HIV.....	= 0.3%

This shows a much higher risk with HBV than with HIV or HCV. Also following HBV infection, the risk of chronic antigenaemia in HIV-infection patient is 3-6 times that seen in HIV seronegative individuals^{2,0}. HIV infection may alter the natural history of HBV infection in many ways. The response rate to HBV vaccination is lower in HIV- infected recipients. Immunodeficiency may favour the establishment of chronic following acute infection with HBV, and HBV replication is increased with a reduction in the rate of spontaneous loss HBeAg. Also, interferon treatment would appear to be less effective in chronic HBV/HIV dual infection. The immune restoration following the initiation of anti-retroviral treatment may lead to a hepatitis "flare" in chronic HBV carriers. Thus the effectiveness of vaccinating HIV-infection patients at high risk of contracting HBV is uncertain^{2,1-2,3}. Factor that are believed to influence the risk of occupational HIV and HBV transmission include the type and extent of exposure care workers can reduce their risk of exposure to blood and body fluids through the use of basic safety measures, barrier precautions and technologically safety instruments^{2,4,2,7}.

Because of this high exposure rate to excess risk of HBV infection as seen in this study, it has become mandatory to provide safety equipment, measures and regulations for the protection of medical and laboratory staff in our health care institutions. Regulatory and supervisory bodies are necessary to ensure compliance with safety procedures. Adequate funding of the health sector is also a prerequisite to ensuring the provision of all necessary safety equipment for health care workers. Until then, health care workers should continue to regard all blood and body fluids as potentially infective and guard against them.

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