PRELIMINARY STUDY OF HEPATITIS B SURFACE ANTIGEN ON MENTAL HEALTH CARE WORKERS AT FEDERAL NEUROPSYCHIATRIC HOSPITAL BARNAWA, KADUNA NIGERIA

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ABSTRACT

Background: This study was designed to determine retrospectively, HBsAg status, marker of HBV infection, among Mental Health Care Workers (MHCWs) at Federal Neuropsychiatric Hospital (FNPH), Barnawa Kaduna, North West, Nigeria. Two hundred and fifty one, apparently healthy HBV vaccine naïve, MHCWs, who voluntarily participate prior to HBV-vaccination.

Materials and Methods: The screening was carried out using atlas latex haemagglutination test kit, between the months of December, 2000 through March, 2001. The MHCWs were categorized into senior and junior staff. Their ages, years of service, occupation, and department were obtained from year 2000 staff nominal roll. Prior to the study ethical approval was obtained from the hospital ethical committee. Two hundred and fifty one, participant were tested for HBsAg in a pre-HBV-vaccination exercise.

Results: The number and percentages of participants by gender were 127 (50.6%) males and 124 (49.4%) females, respectively. The age range was 19-60 years with a mean age of 37 ± 2 years. The Number and percentages of junior and senior staff were 163 (65.0%) and 88 (35.0%), respectively. The incidence of HBsAg was 72 (28.7%). Incidence rates was highest among the males 41 (32.3%) compared to females 31(25.0%) and51-60yrs (50.0%), the incidence among Junior Staff was 52 (31.9%), while in Senior staff was 20 (22.7%)respectively. MHCWs who served between 26-30 years were 2 (66.7%)and those within 21-25 years were 6 (26.1%).Medical Record Staff were 3 (60.0%) and staff from other departments were Pharmacy 3 (50.0%), Artisans 7 (46.7%), Security 15(42.9%), Occupational Therapy Staff 2 (40.0%), Account Staff 6 (30.0%), Social Welfare 1 (25.0%), Hospital Maids 14 (23.7%), Administration Staff 11 (23.4%), Nurses 8 (17.0%), Medical Laboratory Staff 0 (0.0%), respectively. Statistical analysis obtained using Chi-square (x^2) test showed no statistically significant association ($p > 0.05$) between incidence of HBV-infection and years of service, Sex, Age, Cadre and Occupation.

Conclusions: Due to a high prevalence of HbsAg, a marker of HBV infection, among MHCWs, Pre-vaccination screening should be instituted in Nigeria's mental health facilities for early detection of HBV-infection and selective treatment.

Key words: Hepatitis B virus, HbsAg, neuropsychiatric, vaccination, screening, Barnawa, Kaduna, Nigeria.

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INTRODUCTION

Despite strict enforcement and compliance with Universal Safety Precautions (USP), occupational exposure to hepatitis will continue to occur in hospitals resulting in infections (Elise, *et al*., 2000) When hospital staff or workers become Infected they serve as reservoirs of the virus for further transmission to the patients and or the community. (Samuel,2010) The minimum infectious dose is so low that such practices like sharing of a tooth brush, razor blade and needles can effectively transmit infection (Chang, *et al*., 1993) Hepatitis B Virus (HBV) is known to survive and retain its infectivity for at least 7days in a dried blood on surfaces such as razor blades, bench tops, needles, etc, hence HVB is rated as 50-100 times more infectious than Human Immuno-Deficiency Virus (HIV). (WHO, 1991; Samuel, *et al.,* 2009) Infection with HBV manifests in a number of clinical syndromes, namely, progressive disease ending in cirrhosis, fulminant hepatitis with massive liver cirrhosis, asymptomatic carrier-ship and hepatocellular carcinoma (HCC) (Aganga-Williams, *et al.,* 1999) HBV infection occurs frequently and is highly endemic in Nigeria.(Funke, *et al.,* 1981; Abiodun and Omoike, 1990) The epidemiology of HBV infection in psychiatric patients from developing countries is poorly studied(Cosme*, et al.,* 2005) Although HBV infection has been described as a major public health problem Worldwide, infection with HBV is preventable through the use of a vaccine against HBV.(Moses, *et al.,* 2009) HBV vaccine has been described as highly effective in preventing HBV infection, but its use among health care workers in developing countries is low (Mahoney,*et al.,* 1997;Nasir, *et al.,* 2009) This study was undertaken to determine the pre-vaccination HbsAg status of Mental Health care Workers at Federal Neuropsychiatric hospital, Barnawa, Kaduna,North West, Nigeria, to serve as the basis for a post vaccination study to determine the efficacy and efficiency of HBV vaccination administered to the MHCWs in our setting

MATERIALSAND METHODS

Study Population:

Two hundred and fifty-one (251) apparently healthy, HBV vaccine naive, Mental Health care Workers in the employment of Federal Neuropsychiatric Hospital Barnawa, Kaduna, voluntarily participated in a pre-vaccination HbsAg screening aimed at appropriate HBV vaccine administration.

Data acquisition:

Participant's date of birth (age), years of service, occupation, units or department were obtained from year 2000 staff nominal roll (list). Ethical approval was obtained from the hospitals ethical committee. Test results of HBsAg screening conducted on mental health care workers at FNPH, Barnawa Kaduna between the months of December, 2000 through March, 2001 were retrospectively retrieved from the Department of MedicalLaboratory Scienceresults register

Sample collection and testing:

These were done based on the laboratory routine standard operating procedures in FNPH, Barnawa.

Statistical Analysis

The various data obtained in the study were statistically expressed as mean ± Standard Deviation or Standard Error of the Mean, percentages method and the level of significance was determined using Chi-square (X^2). A value of $p<0.05$ was considered as significant.

RESULTS

HbsAg prevalent rates according to different age groups (Table 1) shows that the highest prevalence (50.0%) was recorded among the age brackets 51-55 and 56-60. Table 2 shows that those who put in 26-30 years of service are the most affected with a prevalence of 66.7%. Table 3, shows that none of the medical laboratory staff is HBsAg sero-positive (0.0%), Nurses are the least infected with a prevalence of 17.0% and medical record staff has the highest percentage of 50.0%.

Table 4, shows that males with 32.3% have a higher prevalence than females with 25.0%, while in table 5, junior staff with a prevalence of 31.9% are higher than senior staff with a prevalence of 22.7%.

Table 1: Distribution of HBsAg of MHCWs by Age group

Age Groups (Years)	No. Screened	No. Positive (%)
< 25	13	5 (38.5%)
26 – 30	34	8 (23.5%)
31 – 35	54	17 (31.5%)
36 – 40	73	24 (32.9%)
41 – 45	47	9 (19.1%)
46 – 50	22	5 (22.7%)
51 – 55	06	3 (50%)
56 – 60	02	1 (50%)
Total	**251**	**72 (28.7%)**

Table 2: Distribution of HBsAg by duration of service

Length of Service	No. Screened	No. Positive (%)
< 1	25	9 (36%)
1 – 5	135	38 (28.1%)
6 – 10	11	5 (45.5%)
11 – 15	22	8 (31.8)
16 – 20	31	4 (12.9%)
21 – 25	23	6 (26.1%)
26 – 30	3	2 (66.7%)
31 – 35	1	0 (0.0%)
Total	**251**	**72 (28.7%)**

Table 3: Distribution of HbsAg by departments or job specification

Occupational Groups	No. Screened	No. Positive (%)
Clinicians (Doctors)	5	2 (40.9%)
Nurses	47	8 (17.0%)
Hospital Maids	59	14 (23.7%)
Medical Laboratory Staff	3	0 (0.0%)
Artisans	15	7 (46.7%)
Pharmacy Staff	6	3 (50.0%)
Medical Records Staff	5	3 (60.0%)
Social Welfare Staff	4	1 (25.0%)
Occupational Therapy Staff	5	2 (40.0%)
Security	35	15 (42.9%)
Accounts Staff	20	6 (30%)
Administration Staff	47	11 (23.4%)
Total	**251**	**72 (28.7%)**

Table: 4Distribution of HbsAg by gender

Sex	No. Screened	No. Positive (%)
Male	127	41 (32.3%)
Female	124	31 (25.0%)
Total	**251**	**72 (28.7%)**

Table 5: Distribution of HBsAg by cadres

Cadre	No. Screened	No. Positive (%)
Junior Staff	163	52 (31.9%)
Senior Staff	88	20 (22.7%)
Total	**251**	**72 (28.7%)**

DISCUSSION

This study has shown that hepatitis B virus (HBV) is prevalent among MHCWs in Kaduna, North-West, Nigeria. This is in agreement with earlier reports that HBV is known to be endemic in Nigeria with special risk groups such as health care workers (HCWs) having a higher incidence (Baker, *et al*., 1970; Olubuyide, *et al.*, 1997; Belo, 2000). The overall prevalent rate of 28.7% obtained in this study is high and may be a reflection of the endemicity of HBV-infection associated with mentally ill patients and MHCWs (Tey, *et al*., 1987; Ares, *et al.,* 1989; Chang, *et al.,* 1993; Ascensio, *et al.,* 2000; Rosenberge, *et al.,* 2001; de-souza, *et al.,* 2004; CDC, 2012). It was observed that more studies were conducted on the patients than the MHCWs. This is an indication that the MHCWs do not take good care of themselves both in the studies carried on HBV and in the observation of universal safety precautions (USP).

The mental health patients and MHCWs have been reported to have a high Prevalence of HBV-infection (Gmelin, *et al.,* 1983; Franson, *et al.,* 1986; Prats, *et al.,* 1990). The mental health patients are stigmatized, traumatized, abused and neglected by their relations and the general society which make them vulnerable to all sorts of infections, HBV-infection inclusive, so the high prevalence of hepatitis B virus infection obtained in this study may be a picture of the patients status in Nigeria, because it was reported that the risk of HBV infection in health care workers (HCWs) depend on the prevalence of HBV-infected patients' the HCWs are exposed to and the frequency of exposure to infected blood and or other body fluids (Gibas, *et al.,* 1992; Finlayson, *et al.,* 1999; CDC, 2001; CDC, 2003).

In this study there was no statistically significant association recorded between the prevalence of HBV-infection and age, sex, occupation, cadres and years of service.

Males have been reported to have higher HBV prevalence than females (Mojan, *et al.,* 1990; Chang, *et al.,* 1993; Samuel, 2010). This is similar with the present study and the high prevalence seen in males in this study may be due to struggling with difficult patients who on several occasions have to be compelled to even come to the hospital by their relations, therefore they have to be forced to accept hospital procedures, such as injections, blood sample collections, etc and in the struggle that ensured between the MHCWs and the patients, the MHCWs may sustain injuries through which the HBV may gain access to the blood stream. Hepatitis B Virus is known to survive on surfaces such as needles, table tops etc for up to 7days (Magolis, *et al.*, 1991; Emechebe, *et al.,* 2009; Samuel, 2010). In this study the high prevalence of HBV-infection recorded among the Junior staff (majority of whom are the hospital maids) may be attributable to the stability of HBV on surfaces such as table tops, needles etc, which these categories of HCWs comes in constant contact, without observing universal safety precautions, on daily basis. The present study recorded the highest HBV prevalence of 50% in the age groups 51-55 and 56-60 years and those who put-in 26-30 years in the service (66.7%), this may be associated to lowered immunity seen in this group of people (Ayoola and Adelaja 1986). Based on occupational groups, the highest prevalence (60%) was recorded among the medical record personnel, this may be linked to non-observation of universal safety

precautions (USP) and struggling with difficult patients, this finding contradicts other reports (Olubuyide *et al.,* 1997; Gibas, *et al.,* 1992; Belo, 2000) whom observed 39%, 44.4% and 25.7% and among Surgeons, Nurses and Doctors, respectively as the highest HBV prevalence among health care workers (HCWs). The medical laboratory staff recorded zero (0.0%) prevalence probably as a result strict observance of universal safety precautions. There are some similarities (such as drug abuse, reckless life, etc) between psychiatric patients (through whom MHCWs can contract HBV) and prisons inmates. This study recorded 28.7% and was in agreement with 23.0% recorded among inmates in a Nigerian prison (Adoga, *et al.,* 2009).

CONLUSION

The high prevalence of HBsAg sero-positivity among MHCWs in Northern Nigeria is an indication that pre-vaccination screening should be instituted in mental health facilities through-out the Federation. This may enable early detection and selective treatment of those affected. Additional USP should be strictly observed and public awareness on HBV infection should be put in place.

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