

SERO-PREVALENCE OF HEPATITIS B AND C AMONG MENTALLY ILL PATIENTS ATTENDING A TERTIARY HOSPITAL IN NIGERIA

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Summary

Background: Hepatitis B and C are of global concern and Nigeria is a high endemic zone for the viruses. Persons with severe mental illness have a greater vulnerability to sexual transmitted infections including hepatitis B&C due to risky behaviour they engage in. The aim of this study is to determine the sero- prevalence of hepatitis B and C among persons with mental illness (MII) and compare them with blood donors (BDs) at University of Ilorin Teaching Hospital (UITH), Nigeria.

Methods: A prospective cross-sectional study conducted over a period of 1year, starting from June, 2010, involving 350 each of BDs and MII in an out-patients department of UITH. HBsAg testing was by a one stage hepatitis B surface antigen test strips, while hepatitis C was tested using commercially prepared kits from ACON, USA.

Result: A total of seven hundred participants including 350 patients with MII and 350 blood donors (BDs) were recruited for the study. Most 324(92.6%) and 349 (99.7%) were of the age range ≤ 55 years. There were 179(51.2%) males and 171(48.8%) females. More married BDs live with their spouses (99.0%) and had higher education than MII. Unemployment rate was higher among MII than BDs. The sero-prevalence of Hepatitis B and C among patients with mental illness (MII) was 10.0% and 12.6% respectively as compared to a sero-prevalence of 10.9% and 1.1% in the blood donors.

Conclusion: The prevalence of hepatitis B infection was similar in both subjects (MII) as well as in the blood donors but, in contrast however was higher prevalence of hepatitis C in the MII ($p=0.001$). Routine screening of MII for hepatitis B and C is advocated to control the complications that may arise from these diseases

Key words: *Sero-prevalence, hepatitis B, C, mental illness, blood donors, Nigeria.*

INTRODUCTION

Viral hepatitis particularly, hepatitis B & C are common with the two accounting for up to 75% of all cases of liver disease worldwide making it a disease of global concern.¹ Chronic hepatitis B infection is estimated to occur in about 350 million people worldwide and is commoner between the ages of 25-44 years.² The modes of transmission of hepatitis B&C include sexual contact, exposure to infected blood, body secretions, and breast feeding.³ Reports have indicated higher rate of hepatitis B transmission compared with HIV as a result of the ability of the virus to remain viable and infectious for more than a week in the environment.⁴ Nigeria is classified among the high endemic zone for viral hepatitis B with a prevalence of HBsAg between 2.7-13.3%.^{5,6,7}

Hepatitis C which was discovered in 1989 as a global disease has a worldwide prevalence of 3.3% with about 170-200 million infected individuals.^{2,8} Higher prevalence however has been reported from some African nations such as 14.5% in Egypt.⁹ It is commoner within age 30-49 years and can be transmitted through contact with infected blood.¹⁰ Intravenous drug injection currently accounts for more than half of modes of transmission in USA.¹¹

Persons with serious mental illness have a greater vulnerability to sexual transmitted infections than the general population. Studies have shown that patients with severe or persistent mental illness engage in behaviours that predispose them to sexually transmitted infections including HIV, hepatitis B & C and Syphilis.^{12,13} Risky behaviours like promiscuity, sex trade, and intravenous drug use with shared needles, and unprotected sex predisposes them to blood borne diseases.^{14,15} Other factors such as poor reality perception, affective instability, impulsiveness, vulnerability to victimization, inconsistent condom use as well as inaccurate informations about sexually transmitted infections play significant role^{16,17}

Study from Australia shows a prevalence of 19.4% of hepatitis C in patient with mental illness,¹¹ this figure is quiet high as against 2% prevalence rate for hepatitis C infection in normal individuals in USA.⁷ Most reports on hepatitis B and C infections among people with mental illness are from countries other than Nigeria hence, the need for this study. The aim of this study is therefore to determine the sero-prevalent of hepatitis B and C among patient with mental illness and compare with blood donors at University of Ilorin Teaching Hospital.

SUBJECTS AND METHODS

Description of study Area

This study was conducted at Department of Behavioural Sciences and Blood Bank in the University of Ilorin Teaching Hospital, Ilorin, the capital of Kwara State. Ilorin is located at latitude 8° 30'N and longitude 4° 35'E. There are 16 local government areas in the state with 4 in the Kwara central, 5 in Kwara North and 7 in the Kwara South. The population based on 2006 census and annual population growth rate of 2.5% is 786,426. The inhabitants are largely civil servants in various federal, state and local government offices and parastatals. Farming, trading and operation of small scale industries are other common occupation. Unilorin Teaching Hospital is a referral centre and serves people within the state and neighbouring states like Oyo, Osun, Kogi, Ekiti and Niger

Study Design

The research was prospective cross-sectional study of hepatitis B and C prevalence among patients with mental disorders and compare with blood donors. The study was conducted over a period of twelve months.

The subjects comprises of 350 patients with mental disorder who are on follow up visits to the department of Behavioural sciences of Unilorin Teaching Hospital, Ilorin, Nigeria and

350 blood donors(BDs) were used as control. Many of the donors were family replacement and few were voluntary non-renumerated blood donors. The socio-demographic details (e.g. age, sex, occupation, and risky behaviours etc.) were obtained using a structured questionnaire designed for the study. The questionnaire is self -administered and only those who were unable to read and write were assisted by research assistants in completing the questionnaires. Standard ethical procedure was complied with, in accordance with Helsinki declaration.¹⁹ Unilorin Teaching Hospital Ethical Review Committee which is one of the members of the National Ethics Council in Nigeria approved the study protocol as part of larger study to determine the sero-prevalence of HIV, Hepatitis and Syphilis among the mentally ill patients via a letter referenced UITH/CAT182/12/726. Written informed consent of the participants was equally obtained. Patients that did not give consent to the study were excluded. About 5ml of venous blood was obtained by venipuncture using aseptic technique from all participants. The samples were dispensed into well labeled vacutainer plain bottles. The blood was centrifuged at 2500 rpm for 10 minutes and serum was separated using disposable pipette. The sera were kept at -20⁰C until analyzed for hepatitis B and C. HBsAg testing was by a one stage hepatitis B surface antigen test strip, a qualitative lateral flow immunoassay product of Grand Medical Diagnostic, USA and testing procedures was according to manufacturer's instruction. Antibody to hepatitis C virus was tested using commercially prepared kits from ACONS, USA, according to manufacturer's instruction.

All results were manually sorted out and then imputed into computer and analysis was done by Statistical Package for Social Sciences, SPSS (Windows version 13.0; SPSS Inc, Chicago, IL, US) software.²⁰ Results were calculated as frequencies, means, standard deviations (SD), cross-tabulation, and chi-square. Fisher's exact test, odd ratio at 95% confidence interval calculation was done where necessary, with p-value set at 0.05.

Results

A total of seven hundred participants including 350 patients with mental disorders and 350 blood donors were recruited for the study. Most 324 (92.6%) and 349(99.7%) were of the age range ≤ 55 years. There were 179(51%) males and 171(48.8%) females giving a male: female ratio of 1.1:1. Out of the 144 MII who were married, 105 (72.9%) were living with their spouses compared with 204 (99.0%) of 206 married BDs. Reasons for not living together included “mental illness” (15 MII, 38.5%); “job location”(18, or 46.2%) “misunderstanding” (6 MII, 15.4%). Majority of the married couple were from monogamy setting (251 or 71.9% MII and 242 or 69% BD). Most (140 or 40% MII, and 185 or 52.9% BDs) had up to a tertiary level of education. Significantly more of the BDs had higher educational status than the MII, which had more respondents in the “primary” category than the BD group. About (71 or 21.4% MII and 96 or 27.4% BD) were civil servant, while more of the MII were found in the unemployed and petty traders occupational group (Table 1).

One hundred and seventy six MII (50.3%) were Christians compared with 174 (49.7%) of BDs while 174 MII (49.7%) were Muslims compared with 210 (60%) of BDs. In comparing other lifestyle and risky behaviour practices (i.e. alcohol and cigarette consumption, sexual practices, extramarital engagement, sex trade and self-injection practices), significantly more respondents in the BDs had consumed alcohol than the MII (37 or 10.6% Vs. 11 or 3.1%, respectively), smoked than the MII (19 or 5.4% Vs. 8 or 2.3%, respectively), and had engaged in extramarital sex than the MII (105 or 30.0% Vs. 59 or 16.9%, respectively). However, more of the MII has had blood transfusion in the past than the BDs (40 or 11.4% and 13 or 3.7% respectively), and had also engaged in sex trade than the BDs (12 or 3.4 % and 1 or 0.3 % respectively) (Table 2).

The prevalence of Hepatitis B and C among patients with mental illness (MII) in this study was 10.0% and 12.6% respectively as compared to a sero-prevalence of 10.9% and 1.1% in the blood donors (Table 3,4). The 10.0 and 10.9% prevalence rate of Hepatitis B virus among person with MII as well as in the blood donor group, though not statistically significant as further confirmed that Nigeria is a hyper-endemic zone for this virus. There was statistically significant difference in the prevalence rate of Hepatitis C among person with MII ($p=0.001$). More of MII with hepatitis C infection practice homosexuality (8 or 2.3% and 6 or 1.7%) extramarital sex (27.3% and 25%) and received more blood transfusion (9.1%), take more alcohol(4.5%) and smoke cigarette (4.5%) than the BDs(Table 6)

TABLE 1: Socio-demographic distribution of MII and BD

Variables	MII (N=350) n (%)	VBDs (N=350) n (%)		OR(95% CI)
Gender: male female	179(51.1) 171(48.9)	339(96.9) 11(3.1)	$X^2=190.08$ P-value= 0.000	0.034(0.021-0.05)
Age: 16-35 36-55 56-75 >75	193(55.2) 131(37.4) 25(7.1) 1(0.3)	252(72.0) 97(27.7) 1(0.3) 0(0)	$X^2=11.47$ P=0.0096	0.57(0.41-0.79)
Mean age:	36.5 ±12.3	31.4 ± 8.3	F=41.35 p-value=0.000	
Marital status: divorced married single widowed	18 (5.1) 144 (41.1) 170 (48.6) 18 (5.1)	- 206 (58.9) 143 (40.9) 1 (0.3)	$X^2=42.32$ p-value=0.000	1.34(0.63-2.95)
Family type: monogamy polygamy	123 (71.9) 48 (28.1)	185 (89.8) 21 (10.2)	$X^2=18.791$ p-value=0.000	0.29(0.17-0.51)
Religion Christian Muslim	176 (50.3) 140(40)	174(49.7) 210 (60)	$X^2 = 7.06$ p-value=0.0079	1.517(1.12-2.06)
Occupation: professionals civil Servant businessman/woman skilled Artisan pensioner petty Traders unemployed/housewife	- 75 (21.4) 10 (2.9) 56 (16) 8 (2.3) 56 (16) 145 (41.4)	4(1.1) 96 (27.4) 30 (8.6) 88 (25.1) - 16 (4.6) 116(33.1)	$X^2=50.54$ P=0.95	0.59(0.26-1.3)
Level of education: illiterates others primary secondary tertiary	 32 (9.1) 4 (1.1) 65 (18.6) 109 (31.1) 140 (40)	 18 (5.1) 8 (2.3) 21(6) 122 (34.9) 185 (52.9)	 $X^2=46.275$ p-value=0.000	 3.5(2.08-5.9)

Others = included in this group are home taught Arabic & Islamic education and other teachings in local languages that could not be classified.

TABLE 2: Lifestyles/Risk behaviours of respondents

Variables	MII (N=350) n (%)	BDs (N=350) n (%)	Chi square statistics	OR(95%CI)
Alcohol consumption: yes no	11(3.1) 339 (96.9)	37(10.6) 313 (89.4)	$X^2=13.979$ p-value=0.000*	0.27(0.14-0.55)
Cigarette smoking: yes no	8 (2.3) 342 (97.7)	19 (5.4) 331 (94.6)	$X^2=3.852$ p-value=0.05*	0.41(0.17-1.0)
Anal sex: yes no	6 (1.7) 344 (98.3)	3 (0.9) 347 (99.1)	$X^2=0.45$ p-value=0.502	2.0(0.26-15.64)
Blood transfusion: yes no	40 (11.4) 310 (88.6)	13 (3.7) 337 (96.3)	$X^2=13.8$ p-value=0.000	3.34(1.77-6.33)
Extramartial sex: yes no	59 (16.9) 291 (83.1)	105 (30.0) 245 (70.0)	$X^2=16.126$ p-value=0.000	0.47(0.33-0.68)
Sex trade: yes no	12 (3.4) 338 (96.6)	1(0.3) 349 (99.7)	$X^2=7.838$ p-value= 0.005	12(2.12-72.26)
Oral sex: yes no	11(3.1) 339 (96.9)	6 (1.7) 344 (98.3)	$X^2=0.965$ p-value=0.326	1.86(0.54-6.43)
Self -injection: yes no	- 350 (100)	1 (0.3) 349 (99.7)	$X^2=1$ p-value=1.000	Indeterminate

TABLE 3: Hepatitis B screening

	MII (N=350) <i>n</i> (%)	BD (N=350) <i>n</i> (%)	X^2	p-value	OR(95% CI)
Positive	35 (10.0)	38 (10.9)	0.061	0.8048	0.91(1.88-0.44)
Negative	315 (90.0)	312 (89.1)			

TABLE 4: Hepatitis C screening

	MII (N=350) <i>n (%)</i>	BD (N=350) <i>n (%)</i>	X^2	p-value	OR(95% CI)
Positive	44 (12.6)	4 (1.1)	33.972	0.0001	12.44(5.33-29.03)
Negative	306 (87.4)	346 (98.9)			

TABLE 5: Socio-demographic and risk characteristics of sub-cohort with hepatitis B

Variables	MII (N=35) n (%)	BD (N=38) n (%)	p-value	Fisher's exact (one-Tail)	OR(95% CI)
Gender: male female	24 (68.6) 11 (31.4)	38(100) -	$X^2=11.55$ p-value=0.0007		
Marital status: single married divorced widowed	22 (62.9) 11 (31.4) 2 (5.7) -	21 (60) 17 (40) - -	$X^2=0.54$ p-value=0.765		1.626(0.45-5.88)
Mean age	39.68 ± 10.634	32.0 ± 12.806	0.215		
Education: illiterate primary secondary tertiary others	1 (2.9) 4 (11.4) 12 (34.3) 18 (51.4)	1 (2.6) 2 (5.2) 16 (42.2) 18 (47.4) 1 (2.6)	$X^2=0.17$ p-value=0.996		0.73(3.28- 0.16)
Smoking: yes no	0 35 (100)	2(5.3) 36 (94.7)	$X^2=0.42$ p-value=0.513		
Alcohol: yes no	1 (2.9) 34 (97.1)	5(13.2) 33(86.8)	$X^2=1.36$ p-value=0.245		0.19 (3.05-0.012)
Blood transfusion: yes no	3 (8.6) 32 (94.4)	2(5.3) 36 (94.7)	$X^2=0.01$ p-value=0.925		1.69(0-856)
Self- injection: yes no	- 35 (100)	- 38 (100)			
Number of sexual partners: 0 1 2 3	21 (60.0) 10 (28.6) 3 (8.5) 1(2.9)	17 (48.6) 19 (54.3) 2 (5.7) -	$X^2=1.53$ p-value=0.676		2.07(0.65-6.60)
Extramarital sex: yes no	11 (31.6) 24 (68.4)	5 (13.2) 33 (86.8)	$X^2=2.53$ p-value=0.112		3.03(0.77-11.8)
Same gender sex: yes no	1(2.9) 34 (97.1)	- 38 (100)	NA		
Oral sex: yes no	1(2.9) 34 (97.1)	- 38 (100)	NA		
Anal sex: yes no	- 35 (100)	- 38 (100)	NA		
Sex trade: yes no	1(2.9) 34 (97.1)	1(2.6) 37 (97.4)	$X^2=0.43$ p-value=0.513		1.09 (0.84-1.40)

NA= Not applicable

TABLE 6: Socio-demographic and risk characteristics of sub-cohort with hepatitis C

Variables	MII (N=44) n (%)	BD (N=4) n (%)	p-value	OR(95% CI)
Gender: male female	25 (56.8) 19 (43.2)	3(75) 1(25)	$X^2=0.03$ p-value=0.861	0.44 (4548.41-0)
Marital status: single married divorced widowed	21 (47.7) 18 (40.9) 4 (9.1) 1(2.3)	3 (75) 1 (25) - -	$X^2=0.08$ p-value=0.994	0.39(293-0.000)
Mean age	39.68 ± 10.634	32.0 ± 12.806	0.215	
Education: illiterate primary secondary tertiary others	6 (13.6) 8 (18.2) 10 (22.7) 18 (40.9) 2(4.5)	- - 2 (50.0) 2 (50.0) -	$X^2=1.72$ p-value=0.634	0.6(0-7835)
Smoking: yes no	2(4.5) 42 (95.5)	- 4(100)	NA	
Alcohol: yes no	2 (4.5) 42 (95.5)	- 4(100)		
Blood transfusion: yes no	4 (9.1) 40 (90.9)	- 4 (100)		
Self-injection: yes no	- 44 (100)	- 4 (100)	NA	
Number of sexual partners: 0 1 2 3 4 5 6	32 (72.7) 9 (20.5) 1 (2.3) - 1(2.3) - 1(2.3)	2(50.0) 2(100) - - - - -		
Extramarital sex: yes no	12 (27.3) 32 (72.7)	1 (25.0) 3 (75.0)	$X^2=1.13$ p-value=0.628	0.23(0.70-1.81)
Same gender sex: yes no	2(4.5) 42 (95.5)	- 4(100)	NA	
Oral sex: yes no	2(4.5) 42 (95.5)	-- 4 (100)	NA	
Anal sex: yes no	- 44 (100)	- 4 (100)	NA	
Sex trade: yes no	1(2.3) 43 (97.7)	- 4(100)	NA	

NA= Not applicable

DISCUSSION

Nigeria is reported among nation in hyper-endemic zone for hepatitis B viral infection and the prevalence varies from different part of this country. The prevalence in Nigeria is put between 2.7-13.3%.^{5,6,7} In this present study the sero-prevalence of hepatitis B is 10% and 10.9% among MII and BDs respectively. Finding of 10% from this study though, not statistically significant ($p=0.805$) when compared it with prevalence among the blood donors still further confirmed Nigeria as high endemic zone for hepatitis B infection. Previous study among mothers and their babies from this centre reported a prevalence of 5.7%.²⁴ The higher prevalence rate in this present study probably indicated that men are at higher risk than women. More of blood donors consumed alcohol, smoked cigarette than MII, might be the facts that MII are on follow-up and under close supervision might accounted for this findings. The MII engage in extramarital sex, homosexuality, and sex trade and had received more blood transfusion than the BDs and these probably contributed to the prevalence recorded. Other serological markers of hepatitis B infection such as anti-HBsAg and anti-HBc antibodies were not assayed for in this study.

The sero-prevalence of hepatitis C in this study among MII and BDs is 12.6% and 1.1% respectively. The observed prevalence of 12.6% among MII is statistically significant than in the blood donors ($p=0.001$). The finding from this present study is similar to the finding of 19.4% among person with mental disorders in Australia and as well similar to 14.5% reported in Egypt.⁹ Some persons with mental disorder engage in risky behaviours such as intravenous drug injection with shared needle, unprotected sex, and sex trade making them more vulnerable to STIs such as HIV, Hepatitis B & C and Syphilis.^{12,13} In this study rate of sex trade, homosexuality and blood transfusion was higher in MII than in blood donors. Many of the married subjects were not living with their spouses and reasons given included mental illness and misunderstanding making them more prone them to sex trade and promiscuity as a

means of livelihood and thus increased exposure to STIs. Individuals with MII are found more in the lower socio-economic class and lower education status than BDs and thus can easily be lured into sex for a token. Stigmatization, family rejection, high unemployment rate might predispose them to risky behaviour such as sexual services as a means of obtaining food, money and drugs. Trading sex is particularly worrisome behaviour since it is highly correlated with other STI risk behaviours: drug use, sex with high risk partners, decreased condom use, higher rate of intravenous drug use and needle sharing.^{15,16} According to Rosenberg et al, individual with mental illness who ever traded sex for money and /or drugs are more than 5 times likely to be infected with HIV and approximately twice as likely to have HBV and HCV infection.¹²

Patient with mental disorder shows little knowledge as regard mode of transmission of these diseases and thus prone to STIs. Blood transfusion rate was also higher among MII than in BDs and thus increases risk of transmission of blood borne disease especially if there is no proper pre-transfusion screening of blood for transmissible transfusion infections. There is inconsistency in condom usage among MII due to little knowledge about STIs this was also observed in our study. An Australian study found that approximately 15% of males compared to only 2% of females with severe mental illness always use condoms with a casual or non-primary partner.²¹ Similarly a US study also found that women with severe mental illness had significantly more unprotected vaginal intercourse than their male counterparts²²

Chronic hepatitis B and C infection could result in development of liver cirrhosis and hepatocellular carcinoma, the treatment of which is beyond the reach of common people including person with severe mental illness who may not be gainfully employed and therefore may not be able to afford the treatment.

In conclusion, the sero-prevalence of hepatitis B and particularly, hepatitis C is high compared with the blood donors, we therefore recommend routine screening of all mentally ill patients for hepatitis B and C particularly those suspected to have engaged in some of the risky behaviours mentioned above. This will help in early detection and prevention of long term complications of liver cirrhosis and hepatocellular carcinoma

Limitation

This result can not be generalized to entire Nigeria because it was done in a centre only. The entire country could not be covered due to financial and logistic reason. A multi –center study would have been the best. We hope this would be done in the near future

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