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Prevalence of Hepatitis B Virus among Butchers in Port Harcourt Metropolis

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ABSTRACT Hepatitis b surveillance among butchers was undertaken in Port Harcourt metropolis. The study population comprised 700 apparently healthy butchers, selling within the selected slaughter houses. The survey covered a period of 1year, from February, 2010 to January 2011. The exclusion criteria used included history of Hepatitis B immunization and professional duration less than one year. HBV infection was detected by assay of Hepatitis B surface antigen (HBsAg), using Pitis immunochromatographic and Clinotech Diagnostic Immunochromatographic Strips. HBV Seroprevalence was 13.71% (butchers). In the sections, cattle butchers scored the highest seroprevalence (18%). In the categories, slab butchers had the highest seroprevalence (26.79%). The age brackets with the highest HBV seroprevalence (28.4%) and (22.32%) were respectively 42-52yrs (biological) and 22-28yrs (professional). and although these were significantly (p<0.05) higher than those of their controls, there was no linear relationship between ages and seroprevalence. Seroprevalence significantly (p<0.05) associated with risk factors in connection with butchery than social and medico-activities among butchers while reverse was the case with non-butchers and more butchers.

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Introduction

Several studies have shown that Hepatitis B Virus (HBV) is one of the most common infectious diseases that infect all human races on the surface of earth. And that its infectivity cut across ethnic, professional and age groupings comprising male, female, adult and children (World Health Organization 2002). Acquisition of HBV is by parenteral route which include, percutaneous, sexual and perinatal transmissions (Behal,et al.,2008 Bond, 1972, Ola, et al 2009, Shi, et al 2010). But its pathogenesis follows a hepatic course as the virion binds to a functional receptor - Sodium Taucholate Co transporting Polypeptide (NTCP) on the Liver cell, via the Pre-S domain on the viral surface antigen. The liver becomes infected as the bound virion subsequently becomes internalized by endocytosis .The host adaptive immune response to this infection results in absolute or partial viral clearance as well as hepatocellular damage with expulsion of intracellular enzymes to extracellular space (Chang, 1983 Coffin et al 2011, Iannocone et al 2005, Mahoney and Kane, 1999, Yan et al 2012). Acute HBV infection presents with mild fever, anorexia, nausea, vomiting, body aches, dark urine and progresses to jaundice. Chronic infection may be asymptomatic or associated with chronic inflammation of the liver, leading to cirrhosis over a period of several years, and may culminate in hepatocellular carcinoma (Gan et al 2005, Terrault et al 2005). Perinatal or vertical transmission, which is preventable may lead to low birth weight and, or low intelligent quotient (Oguntola, 2008, Shi, et al 2010).

It has been estimated that more than 2 billion people live today with HBV and that about 350 to 400 million of these remain infected chronically and become carriers of the virus (El-Magrahe et al 2010, Liaw, and Chu,2009, World Health Organization 2002, World Health Organization 2011). World Health Organization reveals that three quarters of the world's population are living in areas where there are high levels of

Tele: E-mail addresses: bayoadeghq@yahoo.com infection, while one million people die every year from chronic active hepatitis, cirrhosis and primary liver cancer (CDC Geographical Distribution/HBV Infection 2003, CDC-2011, Uyar et al 2009, World Health Organization 2002).

Indeed estimates of the prevalence of acute infections and chronic carriers vary from one geographical area to another and among different occupational groups, sex and age brackets. Thus a prevalence rate of 3.8% has been reported in Bulgaria, 0.5% prevalence in Canada, 1.5% in Libya and 6.5% in Bangladesh. In countries such as china, Senegal and Thailand, infection rates are very high in infants, and continue throughout early childhood (El-Magrahe et al 2010, Elizabeth et al 2011, Guilhot et al 1993, PHA-Canada 2012, Riaz et al 2011).

Nigeria is classified among the group of countries endemic for HBV infection with a current infected population of 18 million. Other most endemic areas of the world include South East Asia and the pacific Basin, sub-Sahara Africa and Amazon basin, part of the middle East, the central Asian Republic, some countries of Eastern Europe and other parts of Africa (Hollinger, and Liang,2001, Liaw, and Chu,2009, Mbaawuaga et al 2008). Many interest groups have studied Nigerian population in the area of social, health-care and other professional groupings with respect to HBV seroprevalence. However, a lot more professional, social or ethnic groups still remain to be studied in connection with HBV. This study was aimed at evaluating butchers, given the high risk nature of their professional group to HBV (Akani et al 2005, Bello, 2000, Buseri et al 2008, Ejele, and Ojule, 2004, Forbi, et al 2008, Bond, 1972).

Materials and Methods

Questionaire design

A structured questionnaire was formulated to supply information bordering on personal data and professional identity, health status with respect to hepatitis B, sign and symptoms and any vaccine received previously with date. The purpose of the study and unfamiliar terms in the questionnaire were explained orally to the butchers and non-butchers at the time of interview.

Experimental design

A total of 8 slaughter houses were selected by simple random method from 15 registered slaughter houses situated in Port Harcourt metropolis, south-south of Nigeria. The study approval was obtained from the Veterinary Department, Ministry of Agriculture, Rivers state and the butchers union of the selected slaughter houses.

Using multistage sampling technique, blood samples were collected from 700 butchers operating at different sections (cattle, goat and pig) through venepuncture between February and September 2010.The subjects were within different biological and professional age brackets.

The sera obtained were screened for HBV worker (HBsAg) using pistis immunochromatographic strip, USA. The results were further confirmed with smart check HBsAg immuno Assay kit produced by Global medicals, South Africa (PTY) Ltd, Cape Town. Test procedures followed the specification of the manufacturers of both kits. Butchers who had previous hepatitis B immunization and those with professional duration less than lyr were eliminated from the study.

Statistical Analysis

The data generated were analyzed using SPSS Version 16 software.

Result

The total subjects who was seropositive to hepatitis B virus in butchers was 96(13.7%). In age group 20-30years 20(12.4%) was the positive rate while it was 39(13.5%), 25(28.4%), 8(8.4%), 3(5.4%) and 1(8.3%) in age groups 31-41years, 42-52years, 53-63years, 64-74years and >75years respectively in butchers as shown in Table 1.

In age group 20-30years 10(5%) was the positive rate while it was 6(3.31%), 4(4.17%), 12(12.24%), 5(10.63%) and 1(5.6%)in age groups 31-41years, 42-52years, 53-63years, 64-74years and >75years respectively in non butchers as shown in Table 1. **Table 1: Prevalence of Hepatitis in Butchers in different age**

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group								
Age	No of	HBV	HBV	р				
group(Years)	group(Years) Subjects		Negative					
		(%)	(%)					
20-30	161	20(12.4)	141(87.6)	P<0.05				
31-41	288	39(13.5)	249(86.5)	P<0.05				
42-52	88	25(28.4)	63(71.6)	P<0.05				
53-63	95	8(8.4)	87(91.6)	P<0.05				
64-74	56	3(5.4)	53(94.6)	P<0.05				
>75	12	1(8.3)	11(91.7)	P<0.05				
Total	700	96(13.7)	604(86.3)	P<0.05				

Duration in the profession showed that butchers who spent 1-7years had 34(11.89) positive rate while it was 22(15.38), 5(4.50), 24(21.82), 3(7.89) and 2(14.29) in 8-14years, 15-21years, 22-28years, 29-35years and >36years respectively in years of professionalism as shown in Table 2.

Table 2: Hepatitis in Butchers based on duration of

profession							
Age group	No of	HBV	HBV	р			
(Years)	Subjects	Positive (%)	Negative (%)				
1-7	286	34(11.89)	252(88.11)	P<0.05			
8-14	143	22(15.38)	121(84.62)	P<0.05			
15-21	111	5(4.50)	106(95.5)	P<0.05			
22-28	110	24(21.82)	86(78.18)	P>0.05			
29-35	38	3(7.89)	35(92.11)	P<0.05			
>36	14	2(14.29)	12(85.71)	P<0.05			
Total	700	92(13.14)	608(86.86)	P<0.05			

The incidence of HBV among cattle butches was 90(18%) of the total tested (500). The prevalence was 4(2.56%) out of 156 among goat butchers while it was 2 (4.55%) from the 44 tested among the pig butchers as shown in table 3.

Table 3: Hepatitis in Butchers based on section of butcher

section	Total	Prevalence (%)
Cattle	500	90(18%)
Goat	156	4(2.56%)
Pig	44	2 (4.55%)
Total	700	96(13.71)
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The result for risk ratio in in each group is as shown in table 4 below.

Table 4: Risk ratio in the study groups

Answer	Ν	HBV	Relative	Ν	HBV	Risk	Р
		Positive	Risk		Negative	Ratio	Value
			Ratio				
Yes	52	14(26.92)	0.17	16	1(6.25)	0.03	< 0.05
No	648	82(12.64)		634	37(5.93)		
Yes	34	19(55.88)	0.25	2	0(0.00)	0	< 0.05
No	666	77(11.56)		638	38(5.96)		
Yes	16	10(62.5)	0.11	10	1(10)	0.003	< 0.05
No	684	86(12.1)		630	37(5.87)		
Yes	104	6(5.75)	0.07	125	10(7.94)	0.36	>0.05
No	596	90(15.1)		514	28(5.45)		
Yes	330	45(13.64)	0.78	200	28(14.00)	2.75	>0.05
No	370	13.78)		440	10(5.96)		
Yes	2	0(0.0)	0	1	0(0.0)	0	>0.05
No	698	96(13.75)		639	38(5.96)		
Yes	18	1(5.56)	0.007	14	1(7.14)	0.03	>0.05
No	682	95(13.95)		621	37(5.91)		
Yes	16	1(6.25)	0.008	19	2(10.53)	0.05	>0.05
No	684	95(27.6)		621	36(5.8)		
Yes	23	2(13.04)	0.003	6	0(0.0)	0	< 0.05
No	677	93(13.74)		634	38(5.88)		
Yes	410	62(15.12)	1.82	378	24(6.35)	1.73	< 0.05
No	290	34(11.72)		262	14(5.34)		
	Answer Yes No Yes No Yes No Yes No Yes No Yes No Yes No Yes No Yes No Yes No	Answer N Yes 52 No 648 Yes 34 No 666 Yes 16 No 684 Yes 104 No 596 Yes 330 No 370 Yes 2 No 698 Yes 18 No 682 Yes 16 No 682 Yes 16 No 682 Yes 16 No 684 Yes 23 No 677 Yes 410 No 290	Answer N HBV Positive Yes 52 14(26.92) No 648 82(12.64) Yes 34 19(55.88) No 666 77(11.56) Yes 16 10(62.5) No 684 86(12.1) Yes 104 6(5.75) No 596 90(15.1) Yes 330 45(13.64) No 370 13.78) Yes 18 1(5.56) No 682 95(13.75) Yes 16 1(6.25) No 682 95(13.95) Yes 16 1(6.25) No 682 95(13.95) Yes 16 1(6.25) No 684 95(27.6) Yes 23 2(13.04) No 677 93(13.74) Yes 410 62(15.12) No 290 34(11.72)	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $

Discussion

Several studies have shown that Hepatitis B Virus (HBV) is one of the most common infectious diseases that infect all human races on the surface of earth. And that its infectivity cut across ethnic, professional and age groupings comprising male, female, adult and children (World Health Organization 2002). The study has shown a prevalence of Hepatitis B Virus (HBV) in 96(13.7) out of 700 subjects studied. This is an indication of endemicity of HBV in slaughter houses within Port Harcourt city among butchers, although no previous report had been published by the state Ministry of Health in this regard.

The study showed that among different biological age groups of butchers the highest incidence of HBV seroprevalence (28.4%) was found in the 42-52year age bracket. Indeed estimates of the prevalence of acute infections and chronic carriers vary from one geographical area to another and among different occupational groups, sex and age brackets.

The study also showed that at cattle section (18%) had the highest risk of infection was and the goat section with lowest risk of infection (2.5%). HBsAg has been demonstrated in 1 out of 300 mosquitoes by Smith *et al* (1972) in Nigeria. Prince (1970) also identified HBsAg in 28 out of 187 pools of mosquitoes caught in the wild in Kenya and Uganda. So it is possible that an arthropod vector (wild) may transmit HBV in African (Edington, and Gilles, 1969). However, in recent years HBsAg have been detected in domesticated animals such as cattle (Shao et al 2004), sheep (Din et al 2001), Pig (Li,et al 2010), and also in chicken (Din et al 1999), which are slaughtered on daily bases for human consumption.

Male to female ratio of HBV seroprevalence in this study tapered towards female in both butchers (13.98%:9.52%) and non-butchers (5.7%:4.6%). This is in line with the findings of

Behal et al (2008) in his study in Northern India, which reported 2.23%: 1.31% and remarked that gender among other variables was significantly associated with HBV seroprevalence, while Chiu et al (2007) concluded that there is a physiologic mechanism of increased vulnerability of men to HBV. The study was also in tandem with the findings of Ola et al (2009) in South Western Nigeria who recorded higher seroprevalence among male (9.9%) than their female counterpart (0%), indicating still that male are more prone to Hepatitis B infection than female.

The two peak prevalence among the female subjects in particular may depict their sexual status among other potential risk factors which tend to climax within the (20-30)years) age bracket with another surge just after menopause, coinciding with the age bracket (42–52)years) in this study.

In the sections of slaughter Houses (Cattle section, goat section and pig section) peak HBV sero-prevalence (18%) was observed among butchers in the cattle section, goat section showed the least sero-prevalence (2.5%). The high sero-prevalence observed among butchers in the cattle section may represent higher risky practices among cattle butchers than butchers in the remaining sections and an increased probability of HBV zoonosis associated with cattle than with other animals slaughtered for human consumption. However, this is not an established fact by this study, but it is a serious probability given the fore-going situation.

Slab butchers constituted the highest susceptible group among categories of butchers (sub-groups- main butchers, table butchers, slab butchers, carriers and rosters) with a seroprevalence of 26.7% leaving main butchers at the trail with 7.5% sero-prevalence among others.

The observed remarkably high sero-prevalence obtained among slab butchers majority of whom were from cattle slab could still be attributed to repeated involvement in risky practices including cuts and constantly standing with bare-foot on pools of animals blood and faeces on the slaughter slab during slaughter period, while the low sero-prevalence seen among the main butchers could be due to their less involvement in meat handling and its associated risky practices as masters, other things being equal.

On slaughter to slaughter bases, the study recorded the highest incidence of HBV among butchers (20.25%) and nonbutchers (6.8%) in Trans-Amadi slaughter and the least incidences (4.17% and 3.23%) in Emenike slaughter and Rumuokuroshi slaughter respectively while no incidences of HBV were recorded in Agip slaughter and Emenike Slaughter respectively, among butchers and non-butchers.

Conclusion

The study revealed high prevalence of 96(13.7%) of HBV among butchers in the selected slaughter houses in Port Harcourt City. Efforts should be made by the government to curb the menace of HBV infection in slaughter houses in Port Harcourt city and its environ

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