SEROPREVALENCE OF HEPATITIS B SURFACE ANTIGEN(HBsAg)IN AKOKO-EDO LOCALGOVERNMENTAREA OF EDO STATE, NIGERIA.

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ABSTRACT

Aims: To determine the seroprevalence of Hepatitis B surface antigen (HBsAg) in Akoko-Edo Local Government Area of Edo State, Nigeria.

Study Design: The study focused on socio-demographic characteristics of volunteers such as age, sex, marital status and location

Place and Duration of Study: This study was carried out among apparently healthy individuals of Akoko-Edo Local government area of Edo State, Nigeria between October 2012 and December 2012.

Methodology: The HBsAg One step hepatitis B surface antigen test strip, a rapid chromatographic immunoassay for the qualitative detection of Hepatitis B surface antigen in serum/plasma, was used for screening the volunteers.

Result: Out of the 455 volunteers screened, 125 people (27.5 %) were positive which consist of 49 male (28.7%) and 76 females (26.8%). Age related prevalence for HBsAg was 18.2 % and 9.2% among those aged 10-40 and 40-70 years respectively. Among single individuals of 101, prevalence of 25.3% was recorded while only 6% (24) was recorded as prevalence among married individuals. This study also reveals that the highest prevalence of HBsAg was observed in Ojirami-Dam community with 40.3% prevalence while the least was observed in Umeme-Osu community with 16.4% prevalence.

Conclusion: This study shows high prevalence of hepatitis B among children and young adult in Akoko-Edo Local Government Area of Edo State, Nigeria. The incidence of the infection among individuals between ages of 10-40 years with 83 people infected (66.4%) calls for concern among the people of the area. This provides evidence for urgent public awareness and mass immunization of the people in area.

Keywords: Hepatitis B Virus (HBV), HBsAg, Prevalence, Apparently healthy individuals, Community.

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1. INTRODUCTION

The awareness campaign against hepatitis B virus, when compared to other diseases like HIV/AIDS, Tuberculosis, Poliomyelitis e.t.c., has not been laudable. This disease is very deadly and it has a similar and broader mode of infection than HIV/AIDS; which today is a global killer, and a threat to global health especially with the youth. Today, hepatitis B virus has caused epidemics in parts of Asia and Africa, and it is endemic in China [1].

Hepatitis is a medical condition defined as the inflammation of the liver and characterized by the presence of inflammatory cells in the tissue of the organ [2]. The condition can be self-limiting or can progress to fibrosis (scarring) and cirrhosis[2]. The different types of hepatitis are caused by different things, but they all produce inflammation of liver. Viral hepatitis refers to several common contagious diseases caused by viruses that attack liver. The most important types of viral hepatitis are hepatitis A, hepatitis B and hepatitis C. Newly discovered forms of viral hepatitis also include D, E, F and G [3]. Another form of hepatitis is non-viral form caused by toxic agents (drugs or chemicals), alcohol or autoimmune processes [3]. Hepatitis may occur with limited or no symptoms but often leads to jaundice, anorexia (poor appetite) and malaise. Hepatitis is acute when it last less than six months and chronic when it persist longer. A person may have a genetic problem, metabolic disorder or an immune related injury. Obesity can be a cause of liver damage which can lead to inflammation. These are known as non-infectious, because they cannot spread from person-to-person [4].

Hepatitis B is an infectious illness caused by hepatitis B virus (HBV) which infect the liver of hominoidea, including humans and causes an inflammation called hepatitis. It was originally known as “serum hepatitis”. Transmission of hepatitis B virus results from exposure to infectious blood or body fluids such as semen and virginal fluids, while the viral DNA has been detected in saliva, tears and urine of chronic carriers with high DNA titre in serum. Perinatal infection is a major route of infection in endemic (mainly developing) countries [5]. Other risk factors for developing HBV include blood transfusion, working in a health care settings, dialysis, acupuncture, tattooing e. t. c. [6]. However hepatitis B virus cannot be spread by casual contact, such as holding hands, sharing eating utensils or drinking glasses, breast feeding, kissing, hugging, coughing and sneezing. The acute illnesses causes liver inflammation, vomiting, jaundice and (rarely) death. Chronic hepatitis B may eventually cause cirrhosis and liver cancer-a fatal disease with very poor response to current chemotherapy [7]. The infection is preventable by vaccination [8]. Hepatitis B virus infection may be either acute (self-limiting) or chronic (long-standing). Persons with self-limiting infection clear the infection spontaneously within weeks to months.

2. MATERIALS AND METHODS

2.1 Study Area

The research work was carried out in Akoko-Edo Local Government Area of Edo State, Nigeria with headquarters at Igarra town. It has an area of 1371 km^2 and a population of 262,110 in the 2006 census. It was created in 1947 as Akoko division from old western state from which they became a local government in 1967, it is composed of over 48 communities which include Igarra, Ugboshi-Afe, Ibilo, Lampese, Imoga, Ososo, Akuku, Ojirami-Dam, Ojirami-Peteshi, Ojirami-Afekunu. Dagbala, Makekee.t.c. with four ethnic groups; the Uneme, Okpameri, Ethuno and Ososo. They are engage in various socio-economic activities like farming, trading, blacksmithing and Civil service.

The study population is a mixture of people from different parts of the country; Igbo, Hausa, Yoruba, Fulani, Egbira, Isane.t.cAkoko-Edo is a center of trade for farm produce such as Cocoa, yam, oil-palm, cassava, corn, cola-nut and cashew. There is also inter-marriage between the indigenes and foreigners because of the hospitality and peaceful co-existence of the people of the town. The aim and details of the

study was explained to the subjects and their parents who gave a verbal consent. The study focused on socio-demographic characteristics of volunteers such as age, sex, marital status and location.

2.2 Sample collection

A total of 450 serum samples were collected from asymptomatic volunteers residing in ten various communities in Akoko-Edo Local Government Area of Edo State, Nigeria. The samples were collected from various primary and secondary schools, religious setting (Mosques and Churches), hospitals, medical laboratories, homes within the Local Government Area. Two milliliter of blood was aseptically collected by vein puncture into plain bottles with no anticoagulant and were allowed to clot and centrifuged for five minutes at 2,000 rpm in order to separate the serum from the clotted blood[9].

2.3 Determination of HBV in serum

The presence of hepatitis B was determined using the HB strip surface antigen test. The blood samples were centrifuged for 4 minutes at 4000 rpm and the serum collected with a needle and syringe. The tip of the test strip was deep into the serum which then reacts with the particles coated with anti HBsAg antibodies [9]. The presence of coloured line in the test region indicates positive results, while absence of coloured line indicates a negative result.

Percentage of infected people

$$\% \text{ of Infected people} = \frac{\text{Number of infected individuals}}{\text{Number of examined individual}} \times 100$$

Table 1: Incidence of HBV among Male and Female individuals in Akoko-Edo L.G.A.

	Male Individual				Female Individual				Total				
Study Area	**Total Male**	**+ve Male**	**-ve Male**	**% of +ve Male**	**Total Female**	**+ve Female**	**-ve Female**	**% of +ve Female**	**Total Screened (Male& Female)**	**Total +ve**	**Total -ve**	**Total % +ve**	**Total % -ve**
Igarra	14	3	11	21.4	26	9	17	34.6	40	12	28	30	70.0
Ibilo	21	6	15	28.6	28	7	21	25.0	49	13	36	26.5	73.5
Uneme-Ekpedo	22	4	18	18.2	28	8	20	28.6	50	12	38	24.0	76.0
Ososo	19	2	17	10.5	22	7	15	31.8	41	9	32	21.0	78.0
Uneme-osu	32	5	27	15.6	29	5	24	17.2	61	10	51	16.4	83.6
Ojirami-Dam	19	11	8	57.8	48	16	32	33.3	67	27	40	40.3	59.7
Ikpeshi	7	2	5	28.5	36	7	29	19.4	43	9	34	20.9	79.1
Uneme-Ethurun	17	3	14	17.6	18	7	11	38.9	35	10	25	28.6	71.4
Imoga	5	4	1	80.0	20	5	15	25.0	25	9	16	36.0	64.0
Lampese	15	9	6	60.0	29	5	24	17.2	44	14	30	31.8	68.2
Total	171	49	122	28.7	284	76	208	26.8	455	125	330	27.5	72.5

Key: +ve= Positive, -ve= Negative

Table 2: Incidence of HBV in married and single individual in Akoko-Edo L.G.A.

Study Area	TNE	TNI	NME	MM	+ve MM	SM	+ve SM	NFE	MF	+ve MF	SF	+ve SF
Igarra	40	12	14	8	1	6	2	26	10	1	16	8
Ibilo	49	13	21	7	1	14	5	28	4	3	24	4
Uneme-Ekpedo	50	12	22	15	-	7	4	28	12	-	16	8
Ososo	41	9	19	6	1	13	1	22	3	-	19	7
Uneme-osu	61	10	32	12	1	20	4	29	11	1	18	4
Ojirami-Dam	67	27	19	7	2	12	9	48	18	9	30	7
Ikpeshi	43	9	7	2	-	5	2	36	-	-	36	7
Uneme-Ethurun	35	10	17	1	-	16	3	18	1	1	17	6
Imoga	25	9	5	-	-	5	4	20	-	-	20	5
Lampese	44	14	15	5	2	10	7	29	13	1	16	4
Total	455	125	171	63	8	108	41	284	72	16	212	60

KEY: TNE-Total number examined, **TNI-**Total number infected, **NME-**Number of male examined, **MM-**Married male, **+ve MM-** Positive Married male, **SM-**Single Male, **+ve SM-** Positive single Male, **NFE-**Number of female examined, **MF-** Married female, **+ve MF-** Positive married female, **SF-** Single female, +ve**SF-** Positive Single female

Table 3: Age prevalence of HBV infected individuals in Akok-Edo L.G.A.

Study Area/Age	10-20	21-30	31-40	41-50	51-60	61-70	Total
Igarra	1	4	5	-	1	1	12
Ibilo	-	5	5	1	1	-	12
Uneme-Ekpedo	2	1	2	3	-	4	12
Ososo	4	1	2	1	1	1	10
Uneme-osu	5	-	3	-	-	2	10
Ojirami-Dam	10	3	3	1	3	7	27
Ikpeshi	1	1	4	1	2	-	9
Uneme-Ethurun	2	5	1	2	-	-	10
Imoga	-	3	3	2	1	-	9
Lampese	3	4	-	6	1	-	14
Total	28	27	28	17	10	15	

Table 4: Age prevalence of HBV infected individuals in Akok-Edo L.G.A.

Study Area/Age	Number Examined	No of Infected Individuals	Percentage Infected
Igarra	40	12	30
Ibilo	49	13	26.5
Uneme-Ekpedo	50	12	24
Ososo	41	9	22
Uneme-osu	61	10	16.4
Ojirami-Dam	67	27	40.3
Ikpeshi	43	9	21
Uneme-Ethurun	35	10	28.6
Imoga	25	9	36
Lampese	44	14	31.8
Total	455	125	49.5

3. Result and Discursion

A total of 455 individuals participated in this study which consists of 171 males and 284 females. The result shows that 125 people (27.5%) were positive for HBsAg. These consist of 49 males (28.7%) and 76 females (26.8%). This study shows that more females were infected than male which is in accordance of a study by Bwogi*et al.*[10]. Who reported a lower prevalence of HBV in men than female and suggested the interplay of circumcision as protective. The incidence of the infection among different age group of individuals of the local government reveals that individuals of between 10-40 years had the highest number of incidence with 83 people infected (66.4%). This may be due to factors such as multiple sex partners, child circumcision, scarification marks, tattoo, sharing of sharp body-piercing instrument like razor blades, sharing toothbrush, promiscuity, lack of sex education, lack of awareness about infections and diseases, vertical transmission and poor health care [11].

It was also observed that the infection is common among single individual with 101 people (25.3%) as compared to married individual with 24 infected people (6%). This is justified by reports by Chang [7] and Uneke*et al.*[12] that high risk individuals have higher probability of getting infected with HBV to its low infectious dose; this encompasses individuals at the age of greatest sexual activities thus supporting the role of sexual transmission of the virus [13].

Of the 455 apparently healthy individuals screened for hepatitis, 125 people (27.5%) were infected which is relatively high in comparison to studies from other parts of the country. The prevalence of the infection reported in this study was higher than the 4.9% and 10.3% reported in Port Harcourt and Jos respectively [14], higher than the 21.3% recorded in Ibadan [15] 15.1% in other two studies in Jos, Nigeria [12,16] and 17.1% among sex workers in Nasarawa State [17]. The 27.5% prevalence of HBV infection in apparently healthy individuals of different local community reported in this study is a cause for alarm in the locality especially with its attendant consequences [18]. These results also show the endemicity and the rising profile of HBV infection in apparently healthy individuals with the consequent risk of transmitting the virus unknowingly. This underscores the need for preventive measures. There is therefore an urgent need for public enlighten campaigns, effective collaboration with Sexually Transmitted Disease programs and the introduction of routine screening of prospective blood donors in Nigeria.

To eliminate HBV transmission in Akoko-Edo, not only will the currently high level of infant vaccination coverage need to be sustained or even increased, but specific efforts to vaccinate populations at high risk for transmission will have to be made. From this study, it was also observed that women had the highest population of infection with 22%. The risk factors associated with Hepatitis B infection are largely obscure to the people of Akoko-Edo. This calls for more studies into the epidemiology of HBV infection in other to develop effective strategies to curb the spread of the diseases. Also needed to ensure the continued success of Hepatitis B immunization is the capacity to measure the impact of vaccination and investigate the potential threats to its continued success. Accurate surveillance data are essential to characterize the population at risk and assess the impact of vaccination-a task that becomes increasingly challenging as morbidity declines. Potential new causes of vaccine failure such as HBV variants, will need to be assessed and the need for booster doses to preserve vaccine-induced immunity should be evaluated regularly as vaccinated cohorts' age.However, there are limitations in the use of HB test strip for diagnosis of HBsAg which include; HBsAg Test Device is for in vitro diagnostic use only, HBsAg Test Device will only indicate the presence of HBsAg in the specimen and should not be used as the sole criteria for the diagnosis of Hepatitis B viral infection.HBsAg Test Device cannot detect less than 1 ng/mL of HBsAg in specimens. If the test result is negative and clinical symptoms persist, additional follow-up testing using other clinical methods is suggested. A negative result at any time does not preclude the possibility of Hepatitis B infection.

4. CONCLUSION

This study shows that there was high prevalence of hepatitis B among children and young adult in Akoko-Edo Local Government Area of Edo State, Nigeria. Hepatitis B surface antigen was determined among 455 volunteers with 125 (27.5%) were seropositive. The incidence of the infection among individuals between ages of 10-40 years with 83 people infected (66.4%) calls for concern among the people of the

area. Further studies should be conducted with the use of third generation ELISA for the seroprevalence of hepatitis B in the locality. It is also recommended that governmental and non-governmental organizations should increase the awareness of the disease caused by the virus and other preventive measures to guide against its spread. Immunization against the disease in the area should also be encourage.

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COMPETING INTEREST

Authours have declared that no competing interests exist.

AUTHOURS' CONTRIBUTIONS

All the authors have cordially supported to the work and preparation of manuscript. Author "AIA and IEI" have designed the entire study and protocols with interpretations of the results and prepared the first draft of the manuscript. Authors "AIA" and "AOO" managed the analyses of the study and computational work respectively. Author "AIA and AOO" guided in the entire research and documented the final draft of the manuscript. All the authors have read and approved the final manuscript.

CONSENT

The aim and details of the study was explained to the subjects and their parents who gave a verbal consent and participated actively in the study.

ETHICAL APPROVAL

Approval to carry out this study was granted by the state Ministry of Health and Education

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