

The Prevalence of Viral Hepatitis: A Case Study of Aliero Metropolis

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ABSTRACT

The scourge viral hepatitis is life threatening and is about to become an epidemic particularly in Aliero metropolis. This study tries to survey the prevalence of hepatitis B and C viruses in Aliero metropolis from 2011 to 2015. This was done by scientifically and systematically gathering data from the hospital laboratory records. Furthermore, surveys were conducted from human subjects; after collecting an ethical clearance from the state ministry of health, informed consents and assents were all sought for from eligible participants respectively (1-65 years) then blood samples were drawn from volunteers for screening against HBV and HCV respectively according to protocol: commercial kits were used, according to the manufacturer's instructions (Abbott Laboratories, Abbott Park, IL), to detect hepatitis B surface antigen (HBsAg; AUSZYME monoclonal EIA) and hepatitis C virus (HCV). The Blood samples collected after informed consent and assent from volunteers were evaluated for the presence and qualitative determination of HBV and HCV surface antigens. The maximum line on the strip would be observed; the strip will be placed on a non-absorbent surface. The strip will be set for 15 min, awaiting the red line to appear or not. Two distinct red lines, one on the control (C) region while other on the test (T) region. The intensity of the red color on the test line varies depending on the concentration of the HBsAg and HCV in the specimen. Therefore shade of red line in (T) region will be considered positive while on the control (C) region and no shade of red color on the test (T) region it as negative. The result of this work along with the existing data which was given to us as additional information from the hospital staff suggests that the prevalence of hepatitis B virus and hepatitis C virus is year dependently increasing.

Keywords: Assent, Blood, Consent, Hepatitis, Metropolis, Prevalence, Virus

INTRODUCTION

Approximately 350 million people are infected with HBV worldwide and the World Health Organization (WHO) estimates that approximately 170 million people are infected with HCV. HBV and HCV infection account for a substantial proportion of liver diseases worldwide. Because the two hepatotropic viruses share same modes of transmission, co-infection with the two viruses is not uncommon, especially in areas with a high prevalence of HBV infection and among people at high risk for parenteral infection. The exact number of patients infected with both HCV and HBV is unknown. Hepatitis is simply an inflammation of the liver; it may be caused by exposure to certain chemicals, autoimmune diseases or by bacterial infections but is often caused by one of several viruses [1,2]. The Hepatitis virus lives in the blood and other body fluids and is transmitted from one person to person through unprotected sexual intercourse with an infected person, sharing infected needles or other sharp agents that break the skin [1]. Hepatitis is a serious health concern worldwide. Countries with the greatest prevalence include Africa, South America, eastern European countries and Asian countries. Incidence and mortality rates vary with each type of the

disease: Being an inflammatory disorder of the liver that may be caused by viruses, drugs and toxins, etc., symptoms include jaundice (yellowing of skin and eyes) and fever-like symptoms. The three major viruses that affect the liver, hepatitis A, B and C (HAV, HBV and HCV) differ according to mode of transmission, pathology and prognosis. Generally, the viruses are transmitted through feces, blood or bodily fluid that contains blood. Fecal contamination of water and food, eating undercooked shellfish and using contaminated intravenous drug needles are all common routes of transmission. Toxins like alcohol and anti-HIV drugs can lead to non-viral hepatitis.

Hepatitis is considered a sexually transmitted disease (STD)

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because it can be contracted and spread through intercourse, contact with genitals and the anus, semen, vaginal fluids and saliva. It is over 100 times more infectious than HIV. Certain high-risk sexual behaviors have led to an increased prevalence of hepatitis in men who have sex with men (MSM).

HBV is a major cause of liver disease morbidity and mortality worldwide, accounting for over 360 million cases of chronic hepatitis and 620,000 deaths per a year [3]. It is hyper endemic (i.e., >8% of the population infected) in Sub-Saharan Africa (SSA) and a major cause of chronic liver disease [4-6]. Perz et al. [7] estimated that 44% of cirrhotic liver disease and 47% of hepatocellular carcinoma cases in SSA are attributed to HBV [8]. A highly effective and inexpensive recombinant DNA vaccine for hepatitis B has been available since 1982 and debuted in Nigeria in 1995. Unfortunately, vaccination programs in Nigeria have not received adequate attention or funding by the government. Further, community misconceptions have hindered increasing coverage rates [9,10]. The United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) estimated that only 41% of Nigerians were vaccinated against HBV in 2013 [11]. The risk of contracting HBV in Nigeria is substantial, not only due to low vaccination rates but also given that as many as 75% of the population will be exposed [12]. Investigators have reported varying national and risk group-specific estimates. Prior reports suggest a prevalence of 10-15% in the average risk Nigerian population [13]. In Nigeria, investigators have found high HBV prevalence among surgeons (25.7%) [14], voluntary blood donors (23.4%) [15] and infants (16.3%) [16]. A 2012 study in Kano Nigeria found that among 440 HIV positive patients, 12.3% were co-positive for HBV [17]. Although, pregnant women are generally considered low risk for HBV infection, rates as high as 11% have been reported in Nigeria [18]. Hepatitis B is the commonest cause of chronic liver disease in Nigeria. In southern parts of the country, up to 58.1% of patients with chronic liver disease were found HBsAg positive [14]. Several authors report on the prevalence of HBV among sub-populations in Nigeria with estimates varying depending on population studied and methods used. However, there is no reliable national survey of HBV exposure in the average risk population and in subgroups most likely to benefit from early detection, surveillance, and treatment.

AIM

The aim of this work is to establish the prevalence of hepatitis B virus and also hepatitis C virus in Aliero metropolis.

The objectives are:

- (i) To collect systematic and scientific data already gathered and documented by the hospital staff of the

General hospital of people who have been tested positive for HBV and HCV.

- (ii) To draw blood from volunteer patients after their consent/assent is well sought for and screen the blood for the presence of HBV and HCV, respectively.

Justification for the study

Justification for this work is based on the fact that, many women who come for Antenatal care, child birth and blood donors both men and women in this health facility (New General Hospital Aliero) were found to be positive for either HBV or HCV or even both and continued to live with the disease in ignorance hence the need for the study.

MATERIALS AND METHOD

Sample collection

Data from the laboratories and card records office of the General Hospital Aliero were gathered for the purpose of this work. Additionally, after informed consent/assent was sought samples of blood were collected from human subjects (male and female of 1 to 65 years old) who often come to the General Hospital Aliero, using 5 ml syringes and transfer in to test tubes containing 2 to 3 drops of anticoagulant and spun for 2 to 3 min using centrifuge machine and plasma was obtained which was used to determine both HBsAg and HCV, respectively.

Serologic testing

Commercial kits were used, according to the manufacturer's instructions (Abbott Laboratories, Abbott Park, IL), to detect hepatitis B surface antigen (HBsAg; AUSZYME monoclonal EIA), anti-HBsAg antibodies (AUSAB), and hepatitis C virus (HCV) antibodies (HCV EIA 2.0). Sera positive for HCV antibodies by EIA were tested by use of the RIBA HCV 2.0 strip immunoblot assay (Chiron, Emeryville, CA).

Determination of HBV and HCV

The blood samples collected after informed consent and assent from volunteers were evaluated for the presence and qualitative determination of HBV and HCV surface antigens, followed by immersion of the strip in to the plasma for 10-15 s. The maximum line on the strip would be observed in order to avoid exceeding the line; the strip will be placed on a non-absorbent surface. The strip will then be set for 15 min, awaiting the red line to appear or not. Two distinct red lines, one on the control (C) region while other on the test (T) region. The intensity of the red color on the test line varies depending on the concentration of the HBsAg and HCV in the specimen. Therefore shade of red in the test (T) region will be considered positive while one red line on the control (C) region and no shade of red color on the test (T) region it as negative.

RESULTS

The result of this work reveals that the communities in question have some degree of hepatitis year dependently. Being a pilot study, the participants were randomly selected from both Aliero town and its environments the only barrier or exclusion is 0 to 11 months old peditrics, who were not allowed to participate in the blood draw or the study due to fear of hyperthermia and other possible related adverse effects on the peditrics. **Table 1** show that in 2011 about

0.73% of the men were found to be positive for HBsAg while women about 0.49% were found to be positive for the same HBsAg. Subsequently, in 2012, 0.79% and 0.62% were found to be positive for men and women respectively and in 2013 we have 0.88% positive for men and 0.49% positive for women, while in 2014 we have 0.92% and 0.51% positive for men and women respectively, finally we have 0.90% and 0.39% HBsAg positive for men and women, respectively.

Table 1. Results of HBV of 4-65 years old volunteers.

| Years | Population | Men | Women |
|-------|------------|----------------------|---------------------|
| 2015 | 1792 | 16.17 ± 2.21 (0.90%) | 9.00 ± 1.44 (0.39%) |
| 2014 | 1466 | 13.42 ± 1.62 (0.92%) | 7.50 ± 1.20 (0.51%) |
| 2013 | 1453 | 12.83 ± 1.44 (0.88%) | 7.08 ± 1.60 (0.49%) |
| 2012 | 1113 | 8.75 ± 1.10 (0.79%) | 6.92 ± 1.00 (0.62%) |
| 2011 | 1027 | 7.50 ± 0.63 (0.73%) | 5.00 ± 0.53 (0.49%) |

In the same vein, those who tested positive for HCV from 2011 to 2015 for men and women respectively are as listed below: 0.07% men 0.05% women, 0.09% men 0.09% for

women, 0.10% for men and 0.06% for women, 0.10% men and 0.09% women and 0.07% men and 0.08% for women who tested positive for HCV (**Table 2**).

Table 2. Results of HCV of 4-65 years old volunteers.

| Years | Population | Men | Women |
|-------|------------|----------------------|---------------------|
| 2015 | 1792 | 1.33 ± 0.319 (0.07%) | 1.50 ± 0.55 (0.05%) |
| 2014 | 1466 | 1.42 ± 0.31 (0.09%) | 1.25 ± 0.30 (0.09%) |
| 2013 | 1453 | 1.50 ± 0.28 (0.10%) | 0.92 ± 0.22 (0.06%) |
| 2012 | 1113 | 1.00 ± 0.30 (0.10) | 1.00 ± 0.20 (0.09%) |
| 2011 | 1027 | 0.67 ± 0.18 (0.07%) | 0.50 ± 0.23 (0.08%) |

DISCUSSION

Dual infection with HBV and HCV is not uncommon just as reported by Liu and Hou [19] that particularly in geographic areas where a high endemic level of both infections is documented, such as Southeast-Asia and Mediterranean. In general, the prevalence is around 10-20% in patients with chronic HBV infection and 2-10% of anti-HCV-positive patients to have markers of HBV infection. Aliero is one of the local Government headquarters in Kebbi State, North-Western Nigeria, Africa, with a population of hundreds of thousands of people and is a commercial center due to its high onions cultivation. The results of this study shows that men appear to be more predisposed to the susceptibility of both hepatitis B virus as well as the hepatitis C virus. All the more, there appears to be a gradual but steady increase in the incidence rate of the infections year dependently for both HBV and that of HCV, respectively. This might likely be due to unawareness of the community and its environment and hence no regulatory measures to reduce or control the incidence or possibly due to the same reason of unawareness

plus cultural practices which encourage intra-marriages (very common) and therefore, spreading the disease unawares among family members. The prevalence of hepatitis B and C among the men might not suggest a greater incidence/endemicity as polygamy is the order of the day in the metropolis, which will eventually bridge the gap or even exceed as the case may be. The year 2011 and 2013 which appears to have low incidence might actually represent a true picture or not of the incidence/endemicity this due to the fact that some people only come to health facilities when they fall sick particularly in the rainy seasons when malaria incidence is usually high. Another reason for the steady gradual increase of the infection is probably due to one Government School of Health Technology Jega, Kebbi State Nigeria meant to improve on the lives of the community health wise; ignorantly people involve into administrations of drugs using one syringe and needle for a whole people in the family per time when sick (personal communications) and even worst blood draws and blood transfusions are being done without proper blood check and cross matching before

the transfusion (which is usually obtained in the health facilities) on the assumptions that these people are the same health workers you meet in the health facilities and also that they will reduce cost of transporting themselves as well purchase of cards and other items in the hospitals.

CONCLUSION/RECOMMENDATION

Understanding the community-specific epidemiology of disease, which may vary greatly among other communities, is crucial for identifying the most appropriate preventive and control measures. An overview of the local epidemiology of viral hepatitis in Aliero metropolis is given in this paper. The overall prevalence of hepatitis B and C in the community cannot be reported as low despite the so called low values because only a small fraction were actually sampled in the general population of the community due to so many limitations/factors, because so many people are carrying the disease ignorantly. It is reported that Hepatitis B incidence and prevalence began to decline significantly following the introduction of universal hepatitis B vaccination in 1999 in Croatia. Information on HBsAg seroprevalence is derived from routine testing of certain subpopulations (pregnant women, blood donors) and seroprevalence studies mostly targeted at high-risk populations. Universal childhood vaccination against hepatitis B remains the main preventive measure. Similarly, we recommend a general mobilization for people to know their status, testing for immunity one to two months after the third dose of hepatitis B vaccine for children, health-care workers and general population of the community. We also recommend a major preventive measure, i.e., ensuring safety of blood products/transfusions, prevention of drug misuse/abuse.

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