



PREVALENCE OF HEPATITIS B VIRUS SURFACE ANTIGEN AND HEPATITIS C VIRUS ANTIBODY AMONG PROSPECTIVE BLOOD DONORS AT MURTALA MUHAMMAD SPECIALIST HOSPITAL, KANO, NIGERIA

Mukhtar, Isyaku Gwarzo	Department of Human Physiology, Bayero University, Kano, Nigeria.
Yakasai, Bashir Wada	Department of Human Physiology, Bayero University, Kano, Nigeria.
Muhammad, Sagir Mukhtar	Department of Human Physiology, Bayero University, Kano, Nigeria.
Salisu, Ahmad Ibrahim	Department of Human Physiology, Bayero University, Kano, Nigeria.

Abstract

Hepatitis B and C viral infections with their attendant acute and chronic complications have continued to be important causes of morbidity and mortality especially in sub-Saharan Africa. Transfusion of blood and blood products, life-saving as it may, poses significant risk of acquiring transfusion transmissible infections, such as hepatitis B and hepatitis C viral infections. The aim of this study was to determine the sero-prevalence of HBsAg and HCV antibodies among prospective blood donors at Murtala Muhammad Specialist Hospital, Kano, north west Nigeria. Blood bank records of all prospective blood donors who presented themselves for Phlebotomy between January 2016 to January 2017 were reviewed. All the prospective donors were males. Out of the total of 12,233 reviewed, 819 (6.7%) were sero-positive for HBsAg and 63 (0.52%) were sero-positive for HCV antibody. The highest age specific prevalence of 29.91% for the HBsAg was observed among the age group of 31-35 years, with lowest prevalence of 3.05% recorded in the age group of 51-55 years. Therefore, it is concluded that the prevalence of HBsAg and HCV antibody among prospective blood donors at Murtala Muhammad Specialist Hospital, Kano is relatively low.

Key words: HBV, HCV, Donors, Kano, Nigeria.



Introduction

Blood transfusion is an essential component of emergency and non-emergency patient management. However, there has been increasing public concern over the safety of blood and blood products (El Beltagy *et al.*, 2008). This concern continues to make blood transfusion, even though life-saving, a potential means of transmission of infections especially viral hepatitis (La Torre and Saulle, 2016; Salisu *et al.*, 2017). Of the hepatotropic viruses known to cause liver inflammation, only hepatitis B, hepatitis C, and hepatitis D viruses cause chronic infection (Karoney and Siika, 2013). Hepatitis B virus (HBV) infection runs in phases from simple acute infection with spontaneous resolution to chronic life-long infection eventually leading to mortality (World Health Organization, 2017). Mortality depends largely on age at infection and to a lesser extent immune status (Merrill *et al.*, 2011). About 20% - 60% of children infected between the age of 1 - 5 years become chronically infected (Sibley *et al.*, 2015). Hepatitis B virus is transmitted through two main routes: vertical transmission from mother to child and horizontal transmission through infected blood, blood products, and body fluids (Durro and Qyra, 2011).

Globally, over 2 billion people are said to be exposed to viral hepatitis (Udeze *et al.*, 2009). An estimated 325 million people are said to be carriers of HBV and HCV worldwide in 2015 with 257 million and 71 million having chronic HBV and HCV infections respectively (World Health Organization, 2017). Viral hepatitis caused an estimated 1.34 million global deaths in 2015, 96% of which was accounted for by HBV and HCV (World Health Organization, 2017). Sub-Saharan Africa and Western Pacific bears the greatest burden of global HBV and HCV infections and the incidence is rising (World Health Organization, 2017). Chronic liver disease caused by cirrhosis of the liver and primary liver cell carcinoma are the common final pathways in HBV- and HCV- related mortality (Xiao *et al.*, 2015).

Background of the Research

There has been wide variation in the reported global estimates of HBV and HCV infections in terms of incidence, prevalence, and absolute numbers (Basnayake and Easterbrook, 2016). Africa is said to have an estimated prevalence of 6.1% with wide variation between and within countries (World Health Organization, 2017).

Reported prevalence of HBV and HCV infections in Nigeria varies from one region to another, the population studied, and the nature of study design. In a systematic meta-analysis of reported prevalences across the country Musa *et al.* (2015) reported a pooled prevalence of 13.6% for HBV. Salisu *et al.* (2017) reported a prevalence of 13% among blood donors in a general hospital in Dutse and 9.89% among a similar group at another general hospital in Gumel, both in Jigawa state. Adekeye *et al.* (2013) reported a prevalence of 9.8% among blood donors in Jos, Plateau state, north central Nigeria.

To our knowledge, there's paucity of information on the prevalence of HBsAg and HCV



antibody among prospective blood donors in Kano, north west Nigeria. This study aimed to determine the prevalence of HBsAg and HCV antibody among prospective blood donors at Murtala Muhammad Specialist Hospital, Kano, North West Nigeria.

Methodology

Study Area

The study was conducted at the blood bank unit of Murtala Muhammad Specialist Hospital, Kano, North West Nigeria. The hospital currently has 12 wards with 648 bed spaces. It provides general and specialized health care services to the people of the state and other neighboring states and countries. Established in 1928 by the then British colonial government with the sole responsibility of providing health care to African workers in the employment of the government and native authority, it has grown to become the largest state government owned hospital in the state and arguably the largest in the region in terms of patient turn-out. The hospital has a well-developed medical laboratory department consisting of chemical pathology, microbiology, and haematology unit. The haematology and blood transfusion unit has a blood bank section, which screens prospective blood donors and stores blood for the hospital. Kano state is one of the 36 states of Nigeria made up of 44 local government areas. It has an estimated population of 9,383,682 according 2006 census (National Population Commission (NPC) [Nigeria] and ICF International, 2013).

Study Design

Retrospective, descriptive study

Hospital records of all prospective blood donors who were screened for HBsAg and HCV antibody at the blood bank unit of the hospital between January 2016 to January 2017 formed the subjects of the study.

Hepatitis B viral surface antigen and hepatitis C virus antibodies were determined using SD BIOLINE Hepatitis tests kit for of the biomarker (BIOLINE Inc. Korea). It is an immunochromatographic assay for the quantitative detection of HBsAg and HCV antibodies. Those found to be sero-reactive were send to appropriate clinic for further evaluation and treatment. Prospective donor's age, sex, HBsAg status and HCV antibody status were extracted from the register, tallied and entered in to an excel spreadsheet (2016 version).

Ethical Consideration

Ethical approval was obtained from the ethics committee of Kano state ministry of health and permission of the hospital authorities obtained prior to commencement of the study.

Data Analysis

Data was tallied and then entered into an excel spreadsheet (2016 version), filtered and sorted out and descriptive statistics obtained.



Results and Discussion

A total of 12,333 prospective blood donors were screened at the unit in the period under review. The whole of the study population comprised of males aged 18 to 55 years; blood donation being a male dominated activity in this environment. Of the 12,233 prospective blood donors screened, 819 (6.7%) were reactive for HBsAg, the highest prevalence (29.91%) being among those between 31 – 35year age group. The prevalence rate declined progressively with age. Those in the 51 – 55year age bracket had the lowest prevalence of 3.05%. Sixty three (0.52%) of the study participants were reactive for HCV antibody (table 1).

Table 1: Distribution of HBsAg among prospective blood donors by age

Age groups (years)	HBsAg Reactive N (%)	HBsAg Non-reactive N (%)	HCV antibody	Total N
15 – 20	57 (6.96%)	881(7.72%)	3(4.76%)	938
21 – 25	65 (7.94%)	914 (8.01%)	2(3.17%)	979
26 – 30	123 (15.02% %)	171 (1.50%)	3(4.76%)	1834
31 – 35	245 (29.91%)	3424 (30.00%)	11(17.46%)	3669
36 – 40	124 (15.14%)	1711 (14.99%)	13(20.63%)	1835
41 – 45	139 (16.97%)	1941 (17.01%)	9(14.29%)	2080
46 – 50	41 (5.01%)	571 (5.00%)	15(23.81%)	612
51 – 55	25 (3.05%)	261 (2.29%)	7(11.11%)	286

We reviewed the records of prospective blood donors at the blood bank unit of Murtala Muhammad Specialist Hospital, Kano, North West Nigeria from January 2016 to January 2017. The prevalence of HBsAg among prospective blood donors was found to be 6.7%. This is below the value reported by Salisu *et al.* (2017) in Dutse and Gumel general hospitals (13% and 9.89% respectively) among different categories of intending blood donors. This difference could be due to the fact that their study had a lower sample size of 546. Higher level of formal education, better social interactions that promote healthy lifestyle and access to health services among our study population could be the possible reasons for lower prevalence rate in our study. In another study in Aba, Abia state, South East Nigeria, Kanu *et al.* (2015) reported a prevalence of 5.8% among prospective blood donors. This is lower than the 6.7% reported from this study and may represent regional differences that was alluded to in a meta-analysis by Musa *et al.* (2015). The small sample size (120) and the short duration (3 months) in the Abia study compared less to a larger size and duration of our study could be responsible for the observed differences. Alao *et al.* (2008) reported a prevalence of 20% among prospective blood donors in Benue state, north central Nigeria.

This is one of the highest prevalence reported from any region in Nigeria. They attributed the observed prevalence to the fact that Benue State has the highest HIV/AIDS prevalence and the two infections share similar routes of transmission. Yakubu *et al.* (2016) reported a prevalence of 16.6% among prospective blood donors in Kebbi State, North West Nigeria. This is higher than what we reported and other reports from the region (Salisu *et al.*, 2017). Researchers from the South Western parts of Nigeria also reported varied prevalence rates



of 5.9% by Afolabi *et al.* (2013) in Ibadan and 19.9% reported by Opaleye *et al.* (2013) in Osogbo.

Globally, there has been varying reported prevalence of HBV similar to what was reported within countries (Basnayake and Easterbrook, 2016). Rufai *et al.* (2014) reported a prevalence of 13.3% among Ghanaian blood donors. La Torre *et al.* (2016) reported a pooled global prevalence of HBsAg of 2.1% among intending blood donors. Some researchers from Saudi Arabia reported a prevalence of 3.0% among blood donors (El Beltagy *et al.*, 2008). Yanase *et al.* (2007) reported a prevalence of 4.2% among Filipino blood donors. They analyzed a total of 144,000 Filipino intending blood donors who presented for bleeding between 2002-2004. This current study found the prevalence of HCV antibody among prospective blood donors to be 0.52%. This is lower than the reported prevalence of 2.5% from Maiduguri, North East Nigeria (Baba *et al.*, 1999). Afolabi *et al.* (2013) reported a prevalence of 1.4% from South West Nigeria. Dapus *et al.* (2013) reported a prevalence of 6.1% among prospective blood donors at a teaching hospital in Lagos.

This study found 31-35year age bracket to have the highest age specific HBsAg prevalence of 29.91% followed by 41 - 45year with prevalence of 16.97%. This is similar to what was reported in Dutse and Gumel in Jigawa state with age-specific HBsAg sero-positivity among those aged 31-40 years. And, 36-45 year was reported by Kanu *et al.* (2015) among blood donors in Aba city, Abia State, South East Nigeria. However, Okonko *et al.* (2012) reported the highest age specific HBsAg prevalence among those 16-29 years. Similarly, Gambo *et al.* (2012) reported highest age specific HBsAg prevalence of 8.2% among 25-29year contrary to our finding of 31-35 year. The higher prevalence among younger age group could be due higher rate of risky sexual behavior, intravenous drug abuse, and other risky social practices like tattooing etc. lowest HBV prevalence was found in 51 - 55year age group. This could be due to the high rate of mortality associated with HBV infection leading to death of those infected at early age.

Conclusion

The prevalence of HBsAg and HCV antibody among prospective blood donors at Murtala Muhammad Specialist Hospital is relatively low compared to what was reported from various parts of the Nigeria. Harmful traditional practices like uvulectomy, female genital mutilation, traditional circumcision, and scarification marks should be discouraged in Kano state, Nigeria. Efforts to strengthened routine immunization, effective health education, and periodic screening for HBV and HCV should be adopted in the state with the aim of preventing spread of HBV infection and providing timely treatment to those already infected.



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