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Prevalence and risk factors of Hepatitis B infection in patients attended at the S. D. A. Cooper Hospital, Sinkor, Liberia

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Abstract: Infection with hepatitis B virus causes both significant morbidity and mortality accounting for an estimated 400 million chronic liver infections and diseases. This study aims at determining the prevalence and risk factors of HBV infections among adults in Sinkor, Greater Monrovia. This retrospective study used information recorded in the database of the SDA Cooper Hospital. Records of one hundred and thirty-four (134) adult patients (⩾18) who attended the hospital from January – December, 2016 and were tested for HBV. the overall prevalence of HBV infection was 57 (45.24%). The prevalence was higher in males 43/87 (49.4%) than females 14/39 (35.9%). In terms of age group, the prevalence of HBV was highest, 27/39 (69.2%) in the age group of 30–39 years and lowest, 1/12 (8.3%) age group 70-79 years. Sexual contact and intravenous drug use were the main possible sources of infection as 43.9 % and 28.1 % of the patients were probably infected through these routes. The least possible sources of infection were surgical operations (1.8%) and blood transfusions (10.5%). Findings from this study revealed a high prevalence of HBV infections among adult patients, especially through intravenous drug use and sexual contact. The risk of HBV infection was also found to decrease with age.
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1. Introduction

Hepatitis is an inflammation of the liver, most commonly caused by a viral infection. Of these viruses, hepatitis B virus (HBV) and hepatitis C virus (HCV) infections account for a substantial proportion of liver diseases worldwide. These viruses are responsible for liver damages ranging from minor disorders to liver cirrhosis and hepatocellular carcinoma (HCC). Hepatitis B infection is the 10th leading cause of death worldwide, as a significant number of the chronic carriers go on to develop liver cirrhosis or hepatocellular carcinoma (HCC) and over 1 million die annually from HBV associated liver disease (Wright, 2006). HBV is highly infectious and transmitted mainly via blood, body-fluid contact, and vertical transmission (Lok and McMahon, 2007).

Approximately 7% of the world's population (350 million people) are infected with HBV (Shaw-Stiffel, 2000). The World Health Organization (WHO) has estimated that there are 360 million chronically HBV infected people and 5.7 million HBV-related cases worldwide (WHO, 2009). Infection with hepatitis B virus causes both significant morbidity and mortality accounting for an estimated 400 million chronic liver infections and diseases. It is the most important life threatening viral hepatitis predisposing infected individuals to death from liver cirrhosis and liver cancer. An estimated 1 million people die annually from these chronic HBV and associated complications and pathologies (W.H.O, 2008).

The world has been broadly classified into regions of high, intermediate and low HBV endemicity. A major part of Africa especially the Sub-Saharan region has been classified as having high endemicity and parts of North Africa has been classified as having intermediate endemicity (WHO, 2011).

2. Literature Review

Generally, a high prevalence of chronic HBV is categorized as ⩾8%, intermediate (2-8%) and low (<2%) (W.H.O, 2011). The prevalence of HBV and its modes of transmission vary geographically, and it can be classified into three endemic patterns (Knipe and Howley, 2013; Goldstein *et al*., 2005; Kowdley, 2004). Around 45% of the world's population live in regions of high endemicity, defined as areas where 8% or more of the population are positive for HBsAg such as Southeast Asia and Sub-Saharan Africa. The moderately endemic areas, such as in Mediterranean countries and Japan, are defined as those areas where 2–7% of the population are HBsAg positive, and around 43% of the world's population live in regions of

moderate endemicity. Western Europe and North America are considered as areas with low endemicity (<2% of the population is HBsAg positive) and it constitutes 12% of the world's population (Knipe and Howley, 2013; Nicoletta and Daniel, 2002). In Western Europe and the United States of America, HBV is usually transmitted horizontally by blood products or mucosal contact. In highly endemic areas like Southeast Asia or Equatorial Africa, the most common mode of transmission is vertical transmission perinatally from an HBV-infected mother to the newborn child (Knipe and Howley, 2013; Nicoletta and Daniel, 2002; Thomas *et al*., 2005).

HBV is hyper-endemic (i.e. >8% of the population infected) in Sub-Sahara Africa (SSA) and a major cause of chronic liver disease (Ola *et al*., 2007; Lesi *et al*., 2004; Ndububa *et al*., 2005). Perz *et al*. estimated that 44% of cirrhotic liver disease and 47% of heptocellular carcinoma cases in SSA are attributed to HBV.

Certain types of behaviours increase the risk for contracting HBV such as: use of contaminated needle during acupuncture, intravenous drug abuse, ear piercing and tattooing, sexually active heterosexuals or homosexuals (having more than one sexual partner in the last 6 months), infants/children in highly endemic areas, infants born to infected mothers, health care workers, haemodialysis patients, blood receivers prior to 1975 (blood transfusion), haemophiliacs, prisoners with long term sentences as well as visitors to highly endemic regions (Nicoletta and Daniel, 2002). Several socio-demographic variables have also significantly been associated with the prevalence of hepatitis B virus infection. In a study by Janahi (2014), it was observed that among children 0–15 years of age, the prevalence was low (1.8%), while it significantly increased among the age groups 25–34 & 35–44 ($p<0.0001$, and it dropped again in older ages (7.9%). Sixty-one percent of all HBV–positive persons were 25 to 44 years old. Most notable was the difference in prevalence when it came to gender, the prevalence was significantly higher among males (62.3%; $P<0.01$).

However, the scarcity of data on Liberia and the extent to which existing ones are outdated obviated the need to conduct a survey aimed at determining the prevalence and risk factors of HBV infections among adults in Sinkor, Greater Monrovia, with specific reference to the SDA Cooper Hospital. This will provide useful information for estimation, surveillance and intervention.

3. Methodology

Study Setting

Sinkor is a section of the Monrovia metropolitan area in Liberia where many embassies, health facilities, educational institutions, and non-governmental organizations are located. Tubman Boulevard is the main route in Sinkor, which connects the neighbourhood to central Monrovia. Seventh-day Adventist Cooper Hospital, located in Sinkor, Monrovia, Liberia, is a fully operational hospital which has been managed by Adventist Health International since 2008, and is very active in the community. This hospital approximately 90 staff members and has a regular flow of 150 patients showing up for emergency care every day.

Data Collection

This study used information recorded in the database of the SDA Cooper Hospital. The records of one hundred and thirty-four (134) adult patients (18 and above) who attended the hospital from January – December, 2016 and were tested for HBV, were eligible to participate in this study. One hundred and twenty-six (94%) were included in this study while 8 (6%) were not included in this study because there was insufficient information about the patient in the medical records.

Information extracted from medical records included demographic data (gender, age, marital status, occupation and area of residence), HBV status, risk-behavior patterns (number of sexual partners, history of STI, blood transfusion, alcohol and/or drug use).

Data Analysis

Standard descriptive statistical analysis was performed, for qualitative data analysis. Prevalence rate was calculated to determine the relative frequency of HBV infection. Regression analysis will be carried out to estimate the strength of the association between each infection and potential risk factors with a probability value of $p < 0.05$, considered to be statistically significant.

4. Results

Demographic Characteristics

The records of one hundred and twenty-six (126) adult patients were reviewed in this study. Of the total, 87 (69%) were males and 39 (31.1%) females. Majority, 69.2% were below the age of 50 years and 103 (81.75%) were married with 23 (18.25%) single. Most, 62 (49.2%) of the patients were employed with private institutions, 38 (30.2%) were employed with government, 9 (7.1%) traders, 6 (4.8%) students and 11 (8.7%) unemployed. In terms of area of residence, 119 (94.4%) of the patients lived in urban centres while 7 (5.6%).

Prevalence of HBV Infection

As shown in Table 2, the overall prevalence of HBV infection was 57 (45.24%). The prevalence was higher in males 43/87 (49.4%) than females 14/39 (35.9%). In terms of age group, the prevalence of HBV was highest, 27/39 (69.2%) in the age group of 30–39 years and lowest, 1/12 (8.3%) age group 70-79 years.

Prevalence among married patients was 41/103 (39.8%) while single were 16/23 (69.6%). Patients employed with government showed a prevalence of 20/38 (52.6%), private institution employees 25/62 (40.3%), traders 7/9 (77.8%), unemployed 3/11 (27.3%) and students 2/6 (33.3%).

Possible risk Factors among HBV Patients

Sexual contact and intravenous drug use were the main possible sources of infection as 43.9 % and 28.1 % of the patients were probably infected through these routes respectively (Figure 1). History of STI was considered to be the source of infection for about 15.8% of the infected patients. The least possible sources of infection were surgical operations (1.8%) and blood transfusions (10.5%).

Table 1: Prevalence of hepatitis B in relation to socio-demographic characteristics of patients

Socio-demographic characteristics	HBV Positive No. (%)	HBV Negative No. (%)	Total (%)
Gender			
Males			
Female	43 (49.4)	44 (50.6)	87 (100)
Marital Status	14 (35.9)	25 (64.1)	39 (100)
Married	41 (39.8)	62 (60.2)	103 (100)
Single	16 (69.6)	7 (30.4)	23 (100)
Residence	52 (43.2)	67 (56.3)	119 (100)
Urban	5 (71.4)	2 (28.6)	7 (100)
Rural	7 (77.8)	2 (22.2)	9 (100)
Occupation	20 (52.6)	18 (47.4)	38 (100)
Trader	25 (40.3)	37 (60.1)	62 (100)
Gov. Employed	2 (33.3)	4 (66.6)	6 (100)
Private Employed	3 (27.3)	8 (72.7)	11 (100)
Student Unemployed			

Table 2: Prevalence of hepatitis B in relation age group

Age	HBV Positive No. (%)	HBV Negative No. (%)	Total (%)
17-29	2 (13.3)	13 (86.7)	15 (100)
30-39	27 (69.2)	12 (30.8)	39 (100)
40-49	14 (43.8)	18 (56.3)	32 (100)
50-59	8 (47.1)	9 (53)	17 (100)
60-69	5 (33.3)	10 (66.7)	15 (100)
70-79	1 (12.5)	7 (88)	8 (100)

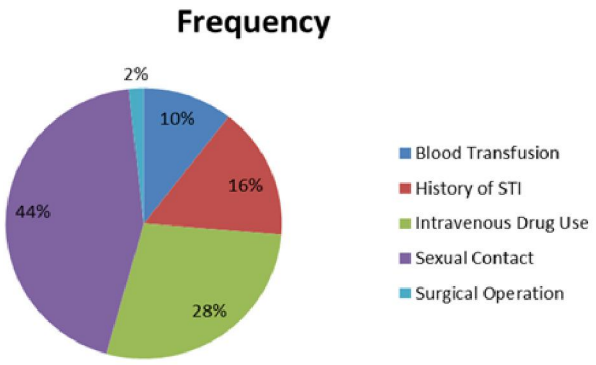

Figure 1: Possible risk factors among HBV positive patients

5.0 Discussions

The result of the present study showed that the prevalence of HBV infection among adults at the SDA Cooper Hospital, Sinkor, Greater Monrovia, was 45.24%. This is dissimilar to other studies conducted in Bahrain and Brazil which revealed lower prevalence of 0.58% and 5.7% to 24.3% respectively (Mendes-Correa *et al*., 2000; Santos *et al*., 2003; Treitinger *et al*., 1999; Braga *et al*., 2006; Souza *et al*., 2004). Prevalence rates in Latin-America and Europe have been reported at 7.9 to 17.0% (De los Angeles *et al*., 2004; Ola and Odaibo, 2007; Lesi et al., 2004; Ndububa *et al*., 2005). Hepatitis B vaccination is the most efficient method to prevent HBV infection and its critical outcomes and most members of the World Health Organization have implemented universal HBV vaccination programs (WHO, 2013). The high prevalence observed may be attributed to low uptake of the Hepatitis vaccine among adults in Liberia. Males accounted for a higher percentage, 49.4%, of patients testing positive for hepatitis B infection in our study. This finding is supported by studies done in Ethiopia, Bahrain and Brazil where the proportion of males infected with Hepatitis B infection was also

higher than females (Ayele and Gebre-Selassie, 2013; Janahi, 2014; Zago *et al*, 2007).

In a study conducted on the prevalence of Hepatitis B infection among African immigrants in Philadelphia, Malomo (2012) found that the risk of having HBV decreased with age. The AOR is: 0.378 C.I:0.033, 4.388 in age group 50-79 compared to AOR 1.00 in age group 18-29. Similar results were published by Antony and Celine (2014), with the lowest proportion of viral hepatitis in 80 years and above. Results from this research corroborate these findings as out of 57 HBV positive cases, the least number was in the highest age group, 70-79 (1).

Identifying risk factors for HBV infection is vital for development of intervention programs. Several studies have shown that sexual and injection drug use exposures are the main risk factors for HBV infection among adolescents and adults in countries of low or intermediate endemicity (Goldstein *et al*., 2002; Shepard *et al*., 2006; Souto *et al*., 2001; Pereira *et al*., 2009; Ayele and Gebre-Selassie, 2013). Findings from this research show similar results with intravenous drug use (28%) and sexual contact (44%) accounting for the highest risk factors and blood transfusion and surgical operations as the lowest, 10% and 2% respectively. in this study. From 2000 through 2010, Janahi (2014) conducted a cross-sectional study on the prevalence and risk factors of Hepatitis B Virus Infection in Bahrain and similar findings were reported with intravenous drug use (24%) and sexual contact (46%) also accounting for the main risk factors.

6.0 Conclusion

The significance of data on HBV infection in adult patients is important for understanding epidemiological trends and for developing prevention strategies. The prevalence of HBV infections among adult patients in this study is high, especially among intravenous drug users and through sexual contact. This emphasizes the need to create adequate awareness and provide counseling on the risk of transmission of HBV to others through needle sharing and sexual intercourse, and to include HBV counseling in educational programs in an effort to decrease the rate of occurrence of the infection. Immunization program against HBV in Liberia should also be enhanced to full coverage.

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