



Research Article

Determine seroprevalence and associated risk factors of HBV infection among pregnant women and its relationship with blood transfusion at Hargeisa Group Hospital, Hargeisa, Somaliland

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Keywords: Hepatitis B; Pregnant women; Blood transfusion; Risk factors; Prevalence



Abstract

Background: The measures are being put in place for the management of Hepatitis B virus (HBV) infection in Hargeisa, Somaliland among pregnant women remain the most vulnerable to develop chronic hepatitis. Routine screening in pregnant women is therefore necessary for effective control. However, the performance of the commonly used the HBsAg sero test strips has been available. Also, identifying the risk factors of transmission in pregnant women is importance for the implementation of preventive measures. Hence, the goal of this study was to determining seroprevalence and associated risk factors with HBV infection among pregnant women.

Material & Methods: The study area was carried out at Hargeisa group hospital in Somaliland from May 2018 up to December 2018. The researcher was collected research pregnancy woman data through questionnaire & used diagnostics methods such as Hepatitis B surface antigen (HBsAg) test, antibodies test (HBsAb) by used anti-card test and ELIZA system. In order to find specific full information's about patients & relationship the associated risk factors with hepatitis B in pregnancy. Data processed and analyzed by used both words and SPSS package. The sample size investigated was 80 patients. Of these, 28 were excluded; among the reasons for exclusion were prior HBV vaccination and known HBsAg sero-positive status.

Aims of Study: The study was designed & aimed to determine seroprevalence and associated factors of HBV infection among pregnant women. To assess and establish if there is significant relationship between blood transfusion and hepatitis B virus at Hargeisa group hospital (HGH).

Results and Discussion: The results in the current study shown that the pregnancy with hepatitis BV and its relation with appeared some symptoms in our study was 24(46.15%) of patients appeared they have cirrhosis symptom, 12(23.08%) of patients answered they have liver failure, while 9(17.31%) of patients appeared yellowish of eyes & skin and 5(9.62%) showed hepatic cancer.

Overall, HBV prevalence: HBsAg was detected in fifteen 15(31.3%) of the participants while all fifteen (100%) had total HbCAb (both IgM and IgG). Of the HBsAg sero-positive women, 26(42.7%) were positive for HBeAg; eight (13.3%) were positive for HBeAb and four 4(9%) were negative for both HBeAg and HBeAb which was close similar with other previous studies. On the other hand, We found identify statistically significant p-values < 0.05 and high relationship between HBV and some demographic and clinical risk factors such as blood transfusions, levels of knowledge about HBV infection in addition to age and marital status.

Conclusion: The results of this study showed that the seroprevalence of HBV infections in pregnant women and its relationship with blood transfusion in Hargeisa Group Hospital, Hargeisa, Somaliland is high. However, further studies are needed to assess the role of other demographic and clinical risk. Urgent action is required to improve hepatitis B infection control measures to reduce dependence on blood transfusions and make new policies for treatment of anemia in HGH.

Introduction

The HBV is blood borne pathogens, frequently causing deaths among general populations and various high risk populations. Four hundred million people in the world are living with chronic hepatitis B virus (HBV) infection & the majority of these individuals acquired the infection during the pregnancy period and early childhood [1]. Immunologic changes of pregnancy may induce a state of increased susceptibility to certain intracellular pathogens, including viruses, intracellular bacteria and parasites [2,3].

Pregnant mothers who test positive for both hepatitis B surface antigen (HBsAg) and hepatitis B e antigen (HBeAg) have 70–90% risk of transmitting infection to their newborn infants and about 10–40% risk if they test positive for only HBsAg [2].

Four major serotypes (adw, ayw, adr and ayr) and nine minor subtypes have been serologically identified at the hepatitis B surface antigen (HBsAg) level and the complete sequencing of DNA from HBV isolates worldwide has led to the identification of eight genotypes (from A to H) [7]. Chronic hepatitis B (CHB) in pregnancy is an important and pervasive issue with unique challenges, however, for pregnant women with chronic hepatitis B virus (HBV) infection, unlike the general population, many special problems need to be considered, such as the influence of HBV infection on the mother and fetus, influence of pregnancy on HBV replication, effects of antiviral treatment on maternal and neonatal outcomes, immunization of newborns and the possible flare of hepatitis after delivery [4,5].

Blood transfusion is lifesaving procedure in which blood cells or products of another person is transferred to the blood stream of another person who lost his blood due to bleeding, depression of the bone marrow or any other cause [3]. Hepatitis B is a liver infection caused by the hepatitis B virus (HBV) it is most severe type of viral hepatitis which can lead to chronic liver disease and even death from cirrhosis and liver cancer. According to WHO 2012 report [4] an estimated two billion people have been infected with the HBV and more than 240 million have chronic (long-term) liver infections and about 1000,000 people die every year due to the acute or chronic consequences of hepatitis B.

On the other hand, most of infected persons have acquired their infection through mother transmission & blood transfusion method [5]. Approximately 65 million of all chronically infected individuals live in Africa [6]. In Cameroon, recent studies reported HBV prevalence rates as high as 10.1% and 12.1% among blood donors in hospital blood banks [7,8].

The prevalence of HBV in pregnancy does not vary much from that in the general population [3,9] Globally, prevalence of HBV difference worldwide, the high prevalence countries include Asia, parts of Middle East, and sub Saharan Africa. In India the HBV positivity differs in the different regions of the country, but more recent studies have reported HBsAg positivity among pregnant women ranging from 0.8 to 1.1 % [10,11]. Hepatitis B is a viral infection that causes liver inflammation and damage to tissues & symptoms includes fatigue, dark urine, joint and muscle pain, loss of appetite, fever, abdominal discomfort, weakness and jaundice). Blood transfusion refers to the administration of donated blood products such as red blood cells, platelets or plasma [13].

In Somaliland over all hepatitis B virus is increasing day after day there is high incidence of hepatitis B virus recently the disease has negative impact on different age groups of our society there is trending numbers of hepatitis B virus cases, the disease is severe causing morbidity and greater mortality overall population, there is also high pregnancy hepatitis B virus and mother to child transmission [14,15].

Therefore, that's why I went to conduct a research to assess if blood transfusion and other risk factors cause the high level of seroprevalence and associated factors of HBV infection in pregnant women in Hargeisa.

It is for these reasons this study was designed & aimed to: determine the prevalence of HBV among pregnant women in Somaliland and identify the associated risk factors with hepatitis B in pregnancy.

To assess and establish if there is a significant relationship between blood transfusion and hepatitis B virus at Hargeisa group hospital (HGH).

Materials and Methods

The study area was carried out in Hargeisa Group Hospital (HGH) is the largest hospital in Somaliland. Our study was conducted from May 2018 up to December 2018. The sample size was 60 patients' respondents drawn from the categories of positive patients in the study area and population.

The sample size was calculated by using Slovic's formula $n = N \cdot \sqrt{1 + N \cdot (E)^2}$. The collection of data in this study was based on two forms. Primary form data which involved the use of questionnaire together with information from selected patients. The collection of secondary form data involved review of official documents such as patient files, patient examination papers, patient diagnostic paper and others previous data collecting. The questionnaire in this study also included the demographic characteristics & used close and open end of questionnaire by the researcher.

After collected data of the participants, 3ml of fresh venous blood was collected by vein puncture into an EDTA tube. The plasma of collected samples was tested for presence or absence of HBsAg using a commercial hepatitis B surface antigen test strip, this required the deposition of two drops of the plasma sample onto the corresponding receiving section of the strip and waiting a minimum of five minutes before reading the test result if two bands appear or one band appear. A new commercial test for hepatitis B surface antigen based on an enzyme-linked immunosorbent-assay system based on the "sandwich" principle with use of microtiter plates, was used for the detection of hepatitis B surface antigen (HBsAg). Results were read within one day by the naked eye or by colorimeter. It was of comparable sensitivity to the radioimmunoassay test.

Data processed and analyzed by using SPSS package. After the analyzed results were presented by using tables and charts. For every potential risk factor assessed (clinical history of patient, history of blood transfusion, anemia, bleeding, level of knowledge, educational level, material status, age, condom use, sex partners and history of sexually transmitted infection), the risk ratio of antigen positivity comparing with those potential risk factors to those without the risk factors was determined. The statistical significance of the correlation between each potential risk factor and antigen positivity was assessed using Fisher's exact test. Risk factors with p-values < 0.05 were to be considered significant and associated.

Results

The sociodemographic characteristics of the patients were collected during the study period, 52 out of 80 of patients investigated in the current study and included pregnant and nonpregnant women. The samples selected by using a systematic random sampling method. Of these samples, 28 were excluded; among the reasons for exclusion were prior HBV vaccination and known HBsAg sero-positive status. There are many different blood tests available and done to diagnose hepatitis B. In the following are some of the common tests done in this study and their meanings. Hepatitis B Surface Antigen (HBsAg) is a protein on the surface of the hepatitis B virus. It can be detected in the blood during acute or chronic hepatitis B virus infection. The body

normally produces antibodies to HBsAg as part of the normal immune response to infection. A positive test means: A person has an acute or chronic hepatitis B virus infection and can pass the virus to others. A negative test means: A person does not have the hepatitis B virus in his or her blood.

The demographic characteristics of patients in this study was enrolled and summarized in table 1 results which showed that the ages ranged from 20 to above 30 years with a mean age of 25.7 ± 6.3 years. According to the results showed that 34(65.4%) of these patients was among 20- 25 years and 9(17.3.4%) of them was 31-35 years, while 6(11.5%) of these patients answered that their age was 36 years and above, so We concluded that the majority and predominant was in age group 20-29 years. On the other hand, the results shown that 45(86.5%) of patients was positive with pregnant women and 7(13.5%) was positive with non-pregnant women, so we concluded that the majority of these patients was pregnant women.

The results also shown that almost all the women 30(57.7%) was married while, 19(36.5%) was single and remaining 3 with (5.8%) was divorced revealed that majority of patients was married.

Distribution of educational level on the patients studied 21(40.4%) majority of patients had completed secondary school, 19(36.5%) had university and 12(23.1%) was finished primary school and about occupation the results shown that 20(38.5%) of them were employed in the formal sector , 20(38.5%) of patients was unemployed and 12(23.1%) were housewife's.

The results in table 2 shown that the pregnancy with hepatitis BV and its relation with appeared some symptoms was 24(46.15%) of patients appeared they have yellowish of eyes & skin symptom, 12(23.08%) of patients answered they have liver

Table 1: Distribution of Demographic Characteristics on the Prevalence of HBV among Pregnant Women in Hargeisa, Somaliland.

Characteristics	Frequency	Percentage
*Age (Years)	52 out 80 patients	%
20-25	34	65.4
26-30	3	5.8
31-35	9	17.3
36 and above	6	11.5
*Type of patients		
Non pregnant women	7	13.5
Pregnant women	45	86.5
*Level of education		
Primary	12	23.1
Secondary	21	40.4
University	19	36.5
*Marital Status		
Single	19	36.5
Married	30	57.7
Divorced	3	5.8
* Occupation		
Employed	20	38.5
Unemployed	20	38.5
Housewife's	12	23.1

Table 2: The correlation between pregnancy hepatitis B virus and appearing symptoms in Hargeisa, Somaliland.

Symptoms of patients	Frequency of patients	HBs positive patients N=52	Percentage (%)
Cirrhosis	80	9	(17.31%)
Yellowish of eyes & skin	80	24	(46.15%)
Liver failure	80	12	(23.08%)
Hepatic cancer	80	2	(3.85%)
Others	80	5	(9.62%)

failure, while 9 (17.31%) of patients appeared cirrhosis, 2 (3.85%) appeared hepatic cancer symptom and the rest 5 (9.62%) answered others. So, the majority of patients appeared liver cirrhosis symptom.

Overall, HBV prevalence: HBsAg was detected in fifteen 15(31.3%) of the participants while all fifteen (100%) had total HbcAb (both IgM and IgG). Of the HBsAg sero-positive women, 26(42.7%) were positive for HBeAg; eight (13.3%) were positive for HBeAb and four 4(9%) were negative for both HBeAg and HBeAb.

According to figure 1 the results showed that 61.54% of the patients answered that blood transmission times with hepatitis B was very high 1 to 5 times in HGH, 34.62% of patients answered low 1 to 3 times, while 1.92% was medium and the rest from 1 to 2 times with percentage 92% of patients answered others. The majority of patients answered very high.

According to figure 2 our results shown 21(40.38%) of patients answered hepatitis B is transmitted through blood transfusion, 18(34.62%) of patients answered through sexual intercourse mood, while 7(13.46%) of patients answered through mother to child and 6(11.54%) of patients answered through needle injection.

The majority of patients answered blood transfusion.

According to figure 3 our results showed 39(75%) of patients answered that anemia is the main cause of blood transfusion in this study and 13(25%) of the patients answered sever blood loss from injury so anemia considered the main cause for blood transfusion in Hargeisa Group Hospital, Hargeisa, Somaliland.

Table 3 results showed that a positive association was noted with statistically significantly between participants' levels of knowledge about HBV infection, Blood transfusion, increasing number of current sexual partners and HBsAg sero-positivity

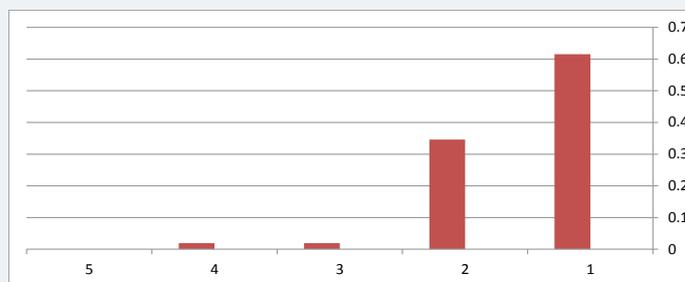


Figure 1: The relationship between number of pregnancy woman with hepatitis and blood transmission times.

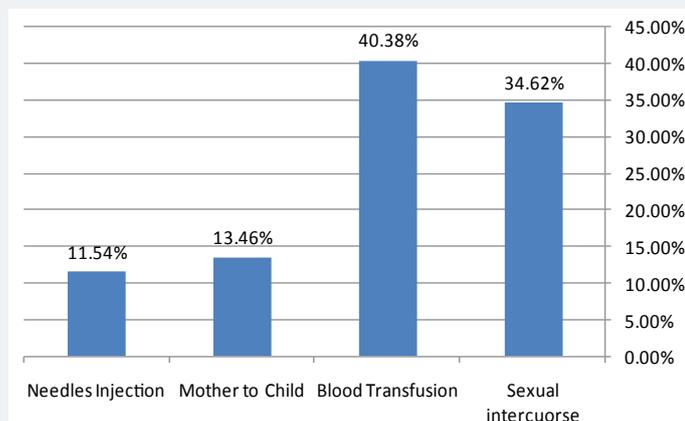


Figure 2: The relationship between of pregnancy women with hepatitis BV and mood of transmission.

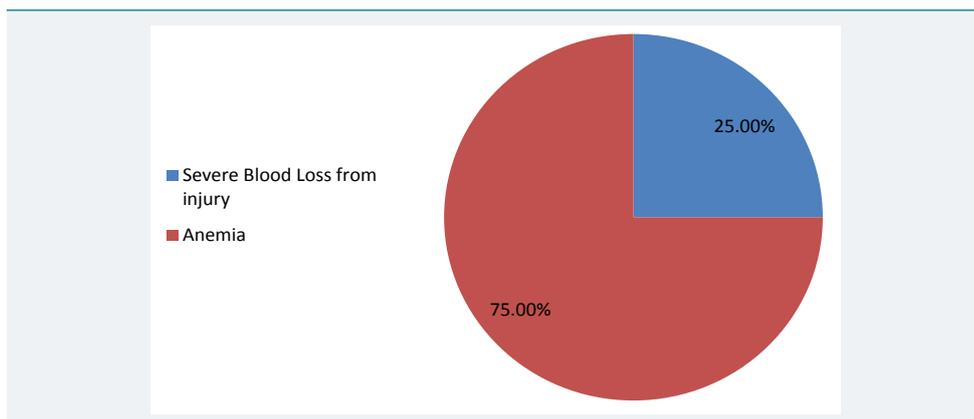


Figure 3: The relationship between of pregnancy women with hepatitis B & causes of blood transfusion.

Table 3: Seroprevalence and its risk factors with HBV positivity prevalence among pregnant women in Hargeisa.

Risk factor Variable	Number of patients	HBsAg positive (%) N=52	Percentage	Risk ratio (RR)	p-value
Blood transfusion	80	19	36.6	0.00	0.037
Sex partners	80	16	31.3	0.84	0.034
Past surgery	80	1	0.52	0.00	0.0
levels of knowledge about HBV infection	80	14	27.04	0.88	0.031
Anemia	80	1	0.52	0,0	0
Bleeding	80	0	0	0	0
Intravenous drug.	80	1	0.52	0.0	0
Total		52	99.9		

(P-value= 0.031, 0.037, 0.034). But a findings showed that not statistically insignificant difference in case anemia, bleeding, intravenous drug as risk factors and presence of HBsAg.

Discussion

This study has been made to determine the prevalence of HBsAg and associated factors among pregnant women in HGH. 52 out 80 pregnant and nonpregnant women were investigated, their serum analyzed for Hepatitis B virus & associated risk factors for HBV infection was also assessed with pretested questionnaires. We found an HBsAg seroprevalence rate of 45(86.5%) was among the pregnant women tested and 7(13.5%) among non-pregnant women, indicating that HBV is highly endemic in Hargeisa city.

We explain the increasing of HBsAg seroprevalence rate in pregnant women lead to a series of physiological changes occur during pregnancy, including vigorous metabolism and increased nutrient consumption, these changes occur to promote the metabolic needs of the mother as well as the needs of the growing fetus, abundant sex hormone produced by the mother needs to be metabolized and inactivated in the liver, metabolism and detoxification in the fetus also depend on the mother's liver, which correlates with aggravation of pre-existing liver diseases and exacerbation of liver damage. Although HBV infection during pregnancy can often be tolerated, severe hepatitis and hepatic failure induced by perinatal hepatic flare reactions still occur, and can have an unfavorable outcome [14].

This result in the current study was similar with the percentage 81.3% & 79.12% prevalence each, found among pregnant women in South East [16], and North East Nigeria [17,18]. This may be due to the similarity in the socio-demographic characteristics, as the studies were hospital based in an urban setting and similar laboratory methods for the analyses. In regional studies also done among pregnant women in different African countries, lower prevalence rate of 53.9% and 46.3% were

recorded in Tanzania [19], 33.7% in Ethiopia [20], 41.2% in Sierra Leone, 36.5% each in Congo and Zambia were reported [19,20], while higher prevalence rate of 75.3% was observed in Cameroon [21].

So, we concluded that the majority of these patients it was between pregnant women and their relationship with age, marital status, level of education and occupation and which may show some high percentages respectively but none of the assessed participant demographic characteristics was significantly associated with HBsAg positivity (Table 1). Level of health education on prevention practices, early seeking of health-care assistance and effective utilization of these health-care facilities and bad demographic characteristics may play a role in this trend. Likewise risk factors such as early marriage, blood transfusion, level of knowledge about HBV infection and high risk sexual behavior highly contribute to the prevalence of HBV among pregnant women.

There is no strong similarity between demographic characteristics of participants of a survey of HBsAg among pregnant women in our study when we compared our results with other studies' results from other parts of the world & which was different as reported by [22,23].

Table 2 shows the results showing the strong correlation between pregnancy with hepatitis B and appearing some complications in our current study particularly with cirrhosis, liver failure and hepatic cancer & it was similar with other results recorded by [24] in Gabon. These similarities could be explained by the fact that it is the same risk group that was studied and also the test used was similar in principle to the one we used in our study. On the other hand, the presence of HBeAg indicates active viral replication in hepatocytes with high risk for developing hepatocellular carcinoma [7,23].

However, we expected this high risk and this is in conformity with the established fact that HBsAg has become an endemic infection in Hargeisa, Somaliland and African countries such as Kenya and Cameroon [25]. According to figure 2 results showed that (61.54%) of the patients answered that blood transmission times with hepatitis B was very high between 1 to 6 times, and 34.62% of patients answered low 1 to 3 times in HGH.

This level of carrier state in women of reproductive age will suggest that there is a high risk of mother-to-infant transmission in the HGH.

The main reasons why we think to identify it as risk factors associated with our study were mentioned in figure 3, so we considered anemia the main cause for blood transfusion in Hargeisa Group Hospital, on the other hand, we found statistically significant p -values < 0.05 with other risk factors associated with HBV and blood transfusion in our study. The results in (Table 3) show that levels of knowledge about HBV infection and blood transfusion played a role in enhancing the relationship between HBV prevalence in pregnant women. This is contrary to many studies carried out elsewhere as most often at least two risk factors are identified.

Table 3 results show that there is statistically significant (p -values < 0.031) with the responses to questions about knowledge of HBV among the pregnant women & blood transfusion who participated in this study. As a whole, majority of the participants 27.04% had never heard of the disease called hepatitis and they did not know that hepatitis B was a virus. Their poor knowledge was explained to them in terms of similarity of transmission with the emphasis on higher infectivity & associated with HBV [12]. When compared these results we found close similarity with earlier studies carried out by [11,21].

Conclusion

The results of the current study showed that the prevalence of HBV infections in pregnant women and its relationship with blood transfusion in Hargeisa Group Hospital, Hargeisa, Somaliland is high and similar with other countries. History of blood

transfusion and the number of blood units transfused, level of knowledge, multiple sexual partners were associated with increased prevalence of HBV infection. However, further studies are needed to assess the role of other demographic and clinical risk factors in these patients. Urgent action is required to improve hepatitis B infection control measures to reduce dependence on blood transfusions and make new policies for treatment of anemia in HGH.

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