Journal of
Medical Microbiology & Diagnosis

Mekonnen et al., J Med Microb Diagn 2018, 7:3
DOI: 10.4172/2161-0703.1000281

Research Article Open Access

Sero-Prevalence of Hepatitis B Virus and Associated Factors Among Pregnant Mothers Attending Antenatal Care in Public Health Facilities, Dire Dawa

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Abstract

Background: According to the WHO report, Ethiopia is regarded as a country with intermediate to hyperendemic viral hepatitis infections, though it has no national strategy for surveillance, prevention and control of viral hepatitis. Without intervention, a mother who is positive for HBsAg and HBeAg has as high as 90% risk of passing the infection to her offspring. Therefore, this study tried to assess the seroprevalence and associated factors of HBV infection among pregnant women attending antenatal care in public health facilities of Dire-Dawa, Eastern Ethiopia.

Materials and methods: A facility based cross-sectional study was conducted from January to March 2018 among 334 pregnant mothers. After obtaining a consent forms, data were collected by face to face interview and blood samples were collected to test for HBsAg. Logistic regression analysis was employed to identify factors significantly associated with HBV infection. A p value <0.05 was considered as level of significance.

Results: The mean age of participated pregnant mothers was 24.93 years (+2 SD 5.21). The prevalence of HBV infection found to be 8.4% in the study area. On multivariate analysis, being single pregnant mothers (p-0.002), having nose/ear pierce (p-0.018), history of blood transfusion (p-0.008), circumcision (p-0.004), and HIV co-infection (p-0.032)} were factors significantly associated with HBV infection.

Conclusion: To halt spread of this virus, increasing awareness on modes of transmission should be considered. Screening all pregnant women for HBV should be made as part of routine antenatal care service. Interventions should be targeted on reduction of circumcision by all concerned bodies.

Keywords: HBV infection; HBsAg; Risk factors; Pregnant mother; Dire Dawa

Introduction

The name "Hepatitis" is derived from the combination of two Greek words "hepatos" (liver) and "itis" (inflammation) which is a disease of the liver usually caused by viral infections [1]. Five different types of hepatitis viruses (A-E) are responsible for causing viral hepatitis [2]. Hepatitis B virus (HBV) is one of these viruses and belong to member of the Hepadnaviridae family which is enveloped partially double-stranded DNA virus [3].

HBV has numerous antigenic components such as Hepatitis B surface antigen (HBsAg), Hepatitis B core antigen (HBcAg), and Hepatitis B envelope antigen (HBeAg) [4]. HBsAg persisting for a period exceeding six months is defined as chronic HBV infection [5]. The virus has a high rate of vertical transmission, causing congenital infection among babies born to infected mothers as well as a major blood-borne and sexually transmitted infectious agent [1,6].

HBV infection is one of the major public health problems in the world [7,8]. Global estimate indicates that 240 million people are chronically infected with HBV and the largest number of people living with chronic HBV live in the Western Pacific region (over 95 million) followed by the African region (over 75 million) [9,10]. Africa is considered as a region of high endemicity and has prevalence of HBV of >8%. Reports also demonstrated that 68,600 people die of HBV infection and more than 300,000 deaths due to liver cancer secondary to hepatitis B every year globally [11,12].

Acute HBV carries a risk both for the mother and the newborn [13]. When the infection is acquired during the perinatal period, the risk of becoming a chronic infection carrier is 95% which is high compared to those acquired during adulthood which is only 5%. Vertical transmission rate reaches approximately 90% when women are seropositive for both HBsAg and HBeAg [14,15]. Fetal and neonatal hepatitis acquired from mother during pregnancy lead to impaired cognitive and physical development in later life of the children [1,16].

According to the WHO report, Ethiopia is regarded as a country with intermediate to hyperendemic viral hepatitis infections, though it has no national strategy for surveillance, prevention and control of viral hepatitis [13,17]. It was estimated that over 5 million people are living with chronic HBV infection among the general population of Ethiopia [10]. Few studies conducted in Ethiopia at different study area and period reported high prevalence rate of HBV infection among pregnant mothers. For instance, a prevalence of 8.1% was reported in Mekelle 2015, 4.9% in Dessei 2014, 5.4% in Bishoftu General Hospital at 2016, and 6.9% in Deder Hospital, Eastern Ethiopia, 2016 [18-21]. Despite the problem, routine HBV screening of pregnant women is not given as routine antenatal care (ANC) service in most health facilities

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Received July 25, 2018; **Accepted** August 06, 2018; **Published** August 11, 2018

Citation: Mekonnen R, Admasu D, Belete M (2018) Sero-Prevalence of Hepatitis B Virus and Associated Factors Among Pregnant Mothers Attending Antenatal Care in Public Health Facilities, Dire Dawa. J Med Microb Diagn 7: 281. doi:10.4172/2161-0703.1000281

of Ethiopia [22]. In Dire-Dawa, Eastern Ethiopia, the magnitude and burden of HBV infection among pregnant women is not known and there is no locally generated information about associated factors of the infection. Therefore, this study tried to assess the sero-prevalence of HBV infection and associated risk factors among pregnant women attended at public health facilities of Dire Dawa Administration.

Materials and Methods

Study area

This study was conducted in public health facilities found in Dire Dawa Administration. Dire Dawa is in the eastern part of Ethiopia about 515 km away from capital Addis Ababa. It lies with a latitude and longitude of 9°36'N, 41°52'E. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), Dire Dawa has total population of 342,827 consisted of 171,930 men and 170,897 women. About 69.92% of the population are considered urban inhabitants, with an estimated area of 1,231.20 square kilometers [23]. The Administration has two public hospital, fifteen health centers and thirty-four health posts; all consisting of 307 units/departments (i.e., 253 units in health center, 23 units in hospital and 34 health posts) [24]. Determination of hemoglobin level, urine analysis, blood group and syphilis screening are given for pregnant women as routine ANC follow-up by all hospitals and health centers, but screening of HBV infection is not practiced in most health facilities found in Dire-Dawa [25].

Study design and period

Facility based cross-sectional study design was employed to determine the sero-prevalence of HBV infection among pregnant mothers in Dire-Dawa health facilities between January to March 2018.

Sample size determination

The total sample size of pregnant women for the study was calculated based on single proportion formula by taking the highest prevalence of HBV infection (8.1%) among pregnant women from a study in Mekelle, 3% (0.03) expected margin of error (d) and 95% confidence interval [18].

$$n=\frac{(Z_{a/2})^2 * p(1-p)}{d^2}$$

$n=318$

Adding 5% non-response rate, which is 16, the final sample size was 334.

Sampling technique

First five public health facilities found in Dire-Dawa Administration were selected by lottery methods. Then the total sample size of pregnant mothers was allocated for each facility proportional to their population size. Finally participated pregnant mothers attending ANC clinic at the time of data collection were select using systematic random sampling method.

Data collection methods

A face to face interview using pre-tested structured questionnaires was administered among 334 pregnant women at the end of their ANC follow-up. Six Clinical nurses were assigned as an interviewer. The questionnaire was adopted from similar study done in Dessei and modified based on the specific objectives of this study [19]. This questionnaire provides detailed information on socio-demographic, behavioral and clinical variables useful for this study. To ensure consistency, the English version of the questionnaire was translated to local language and then back to English by language experts. After obtaining written consent forms from the study participants, data was collected from January to March 2018.

Specimen collection and processing

About 5 ml of venous blood was collected from each participant. Individual blood samples were given unique patient code for easy identification and then transferred to a clean, sterile plain test tube and allowed to clot naturally. After clotting, serum was extracted from each sample by centrifugation at 5000 rpm for 15 minutes and the sera was further isolated using micropipette in to another, sterile plain test tube and stored at -20°C until laboratory analysis. All serum was tested for HBsAg using Enzyme-Linked Immunosorbent Assay (ELISA) (Dialab GmbH, Wiener Neudorf, Austria) based on following manufacturer's instructions [20].

Data quality control

Assigned data collectors were trained health professionals (clinical nurse) who had at least one-year work experience. Then two days training was given for interviewers and blood sample collectors. Another two days orientation was also given to laboratory professionals about sample processing and analysis. Before the start of data collection, pretest was done on 5% of the sample size in health center not included in this study. Two senior laboratory technologists were assigned for each selected Hospitals and Health Centers as supervisors. The principal investigator made daily checkup and monitor the quality of the data and sample collection and analysis procedures.

Data analysis

After checking for completeness, the collected data were first entered and cleaned using EpI data version 3.1 and exported to statistical packaging for social science (SPSS, version 20) for further analysis. Data were analyzed using descriptive statistics and presented by tables and figure. Bivariate analysis was used to evaluate the association between the independent and the outcome variable. Adjusted odd ratio along with 95%CI was employed to identify significant factors associated with HBV infection in multivariable logistic regression analysis. Level of statistical significance was declared at $p<0.05$

Results

Socio-demographic characteristics of study participants

A total of 334 pregnant mothers attending ANC service in selected public health facilities of Dire Dawa Administration were participated with response rate of 100%. The mean age was 24.93 (5.21+2SD) with the minimum and maximum age of 16 and 43 years, respectively.

As displayed in Table 1 below, majority 142(42.5%) of pregnant mothers were in the age group of 25 to 30 years and only 7(2.1%) were in the age of forty years and above. About 259(77.5%) were urban dwellers, 64(19.2%) were illiterate and only 91(27.2%) had Diploma and above. Regarding marital status and occupation of the study participants, majority 291(87.1%) are married, 206(61.7%) are housewife and only 52(15.6%) had office work.

Prevalence of HBV infection relation to risky health behavior and past medical history

As displayed in Figure 1 below out of 334 study participants, sero positivity for HBsAg was detected among 28 pregnant mothers, making the overall prevalence of HBV infections 8.4%.

As shown in Table 2 below about 6(6.1%), 5(15.6%) and 10(13.7%) of HBV infection detected among pregnant mothers who had habit of chewing Khat, smoking and drinking alcohols, respectively. Similarly, 5(23.8%) of the infected pregnant mothers responded they had experienced multiple sexual practice. About 6(14.3%) and 9(23.7%) HBV infection was also detected among pregnant mothers who had tattoo and nose/ear pierce, respectively. Out of 33 participated pregnant mothers who had history of surgery, 6(18.2%) of them found infected. Similarly, from the total of 20 pregnant mothers with history of blood transfusion and/or donation 6(30.0%) were infected, while 10/65(15.4%), 16/115(13.9%) and 4/28(14.3%) pregnant mothers who had history of abortion, circumcision and dental procedures were also found infected with HBV, respectively. On the other hand, a total of 17(5.1%) pregnant mothers were found HIV positive, and HBV was detected among 8(47.1%). So, the HIV/HBV co-infection found to be 47.1% (Table 3).

Bivariate and multivariate analysis of possible factors of HBV infection

On the bivariate analysis, single pregnant mothers, those who had experienced multiple sexual practice, pregnant mothers having nose/ear piercing, previous surgery, history of blood transfusion, history of abortion, circumcision and HIV co-infection showed significant association with sero-positivity of HBsAg ($p<0.05$). However, when these variables were adjusted in multivariate analysis, being single pregnant mothers {AOR (8.5), 95% CI (2.23, 33.04); p-value (0.002)}, having nose/ear piercing {AOR (3.8), 95% CI (1.25, 11.79); p-value (0.018)}, history of blood transfusion {AOR (6.5), 95% CI (1.65, 26.10); p-value (.008)}, circumcision {AOR (4.4), 95% CI (1.59, 12.15); p-value (0.004)}, and HIV co-infection {AOR (4.1), 95% CI (1.13, 15.09); p-value (0.032)} had statistically significant association with positivity of HBV infection (Table 4).

Variables	Frequency	Percent
Age of Mothers		
<18 years	31	9.3
19-24 years	125	37.4
25-30 years	142	42.5
31-39 years	29	8.7
≥ 40 years	7	2.1
Residence		
Urban	259	77.5
Rural	75	22.5
Educational Status		
Illiterate	64	19.2
Primary	84	25.1
Secondary	95	28.4
Diploma and Above	91	27.2
Marital Status		
Married	291	87.1
Single	25	7.5
Divorced or Widowed	18	5.4
Occupation		
House wife	206	61.7
Merchant	31	9.3
Farmer	4	1.2
Cleaner	14	4.2
Office work	52	15.6
Others	27	8.1
Ethnicity		
Amara	64	19.2
Oromo	167	50.0
Somali	45	13.5
Others	58	17.4

Table 1: Demographic characteristics of pregnant mothers attending ANC service in public health facilities in Dire Dawa, Eastern Ethiopia (n=334).

Variables	HBsAg Test Status		
	Positive N (%)	Negative N (%)	Total
Khat Chewing			
Yes	6(6.1%)	92(93.9%)	98(29.3%)
No	22(9.3%)	214(90.7%)	236(70.7%)
Smoking Cigarette/Shisha			
Yes	5(15.6%)	27(84.4%)	32(9.6%)
No	23(7.6%)	279(92.4%)	302(90.4%)
Drinking Alcohols			
Yes	10(13.7%)	63(86.3%)	73(21.9%)
No	18(6.9%)	243(93.1%)	261(78.1%)
Have Multiple Sexual Partners			
Yes	5(23.8%)	16(76.2%)	21(6.3%)
No	23(7.3%)	290(92.7%)	313(93.7%)
Tattooing			
Yes	6(14.3%)	36(85.7%)	42(12.6%)
No	22(7.5%)	270(92.5%)	292(87.4%)
Nose/Ear Piercing			
Yes	9(23.7%)	29(76.3%)	38(11.4%)
No	19(6.4%)	277(93.6%)	296(88.6%)
Sharing of Needles			
Yes	1(14.3%)	6(85.7%)	7(2.1%)
No	27(8.3%)	300(91.7%)	327(97.9%)

Table 2: Prevalence of HBV infection relation with substance use and risky behaviours of pregnant mothers attending ANC service in public health facilities in Dire Dawa, Eastern Ethiopia (n=334).

Discussion

Studies in our country and around the world recommended that pregnant women should be screened for HBV. This is because identifying the infection status of the mother is not only important for herself but also important for her baby to halt the transmission of the virus and the complications resulted by the virus [26].

The prevalence of chronic HBV infection varies greatly in different part of the world. According to WHO classification, the world-wide prevalence of chronic HBV infection can range from high >8% (as in most resource-limited settings), intermediate when the prevalence is between 2% to 8% and low when <2% (as in most developed settings) [27,28].

The finding of this study revealed that the sero-prevalence of HBV infection among participated pregnant mothers in the study area was 8.4% which is higher than reported prevalence of 5.4% in study conducted in Bishoftu General Hospital, 6.9% in Deder Hospital, Eastern Ethiopia, 4.9% in Dessei [19-21]. But this study finding was nearly similar with reported prevalence of 7.8% in Hawassa, 8.1% in Mekele, 7.7% in Cameroon 2013, 8.0% in Mali 2012 and 9.3% in Nigeria 2011 [29-32]. On the other hand, it was lower compared with the reported prevalence of 12.3% in Nigeria 2008 and 10.8% in Yemen 2008 [33,34]. The observed discrepancies in the magnitude of HBV prevalence across different geographical location might be attributed by variation in socio-demographic characteristics of the study population such as socio-cultural environment, tribal practices, traditional operation, sexual practices and medical exposure and the difference in hepatitis epidemiology. Moreover, the variation might be due to geographical situation, methodological difference, the level of awareness, cultural and behavioral differences for the potential risk factors of HBV infection.

The findings of the researches done in Ethiopia and other Africa countries indicated the presence of different factors contributing HBV infection in pregnant mothers. The present study revealed that except marital status, none of the other socio-demographic variables were significantly associated with HBV infection. Accordingly, single pregnant mothers were 8.5 times more likely to be infected with HBV than married pregnant mothers {AOR (8.5), 95% CI (2.23, 33.04); p-value (0.002)}. One possible explanation might be having more than one sexual partner that put single mothers at higher risk for sexually transmitted infections like HBV. Other justification for the observed high prevalence of HBV positivity among single pregnant mothers could be defined with the high probability of exposure for high risk health behavior [35].

This study also revealed that the probability of acquiring HBV infection was higher among pregnant mothers with history of nose/ear pierce and this was statistically significant. The odd of having the infection was 4(3.8) times more likely higher among pregnant mothers who had nose/ear piercing {AOR (3.8), 95% CI (1.25, 11.79); p-value (0.018)}. This was in line with similar study conducted in Deder hospital (AOR 9.1; 95% CI: 1.34–61.79) [21] and in Shashemene

Variables	HBsAg Test Status		
	Positive N (%)	Negative N (%)	Total
Stage of Pregnancy			
First TM	19(9.3%)	186(90.7%)	205(61.4%)
Second TM	4(5.2%)	73(94.8%)	77(23.1%)
Third TM	5(9.6%)	47(90.4%)	52(15.6%)
History of Surgical Procedures			
Yes	6(18.2%)	27(81.8%)	33(9.9%)
No	22(7.3%)	279(92.7%)	301(90.1%)
History of Home Delivery			
Yes	7(13.7%)	44(86.3%)	51(15.3%)
No	21(7.4%)	262(92.6%)	283(84.7%)
Blood Transfusion or Donation			
Yes	6(30.0%)	14(70.0%)	20(6.0%)
No	22(7.0%)	292(93.0%)	314(94.0%)
History of Abortion			
Yes	10(15.4%)	55(84.6%)	65(19.5%)
No	18(6.7%)	251(93.3%)	269(90.5%)
History of Circumcision			
Yes	16(13.9%)	99(86.1%)	115(34.4%)
No	12(5.5%)	207(94.5%)	219(65.6%)
History of Dental Procedure			
Yes	4(14.3%)	24(85.7%)	28(8.4%)
No	24(7.8%)	282(92.2%)	306(91.6%)
HIV Positivity status			
Yes	8(47.1%)	9(52.9%)	17(5.1%)
No	20(6.3%)	297(93.7%)	317(94.9%)
History of Hospitalization			
Yes	5(4.9%)	98(95.1%)	103(30.8%)
No	23(10.0%)	208(90.0%)	231(69.2%)

Table 3: Prevalence of HBV infection and medical history of pregnant mothers attending ANC in public health facilities in Dire Dawa, Eastern Ethiopia (n=334).

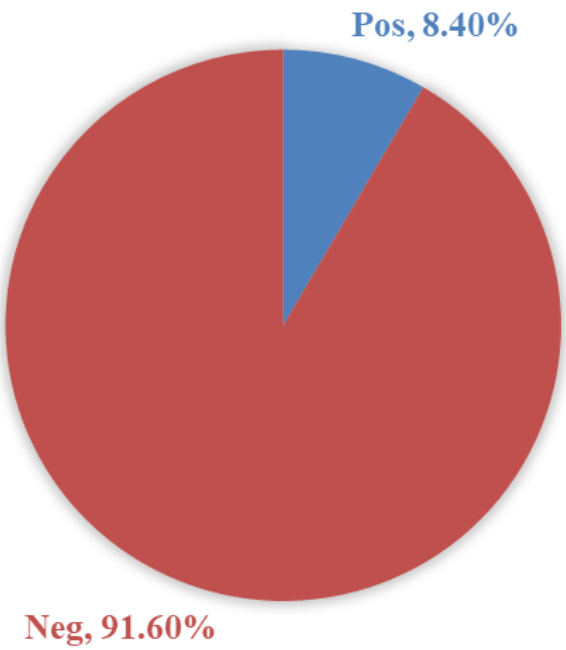

Figure 1: HBV seroprevalence of pregnant mothers attending ANC service in public health facilities in Dire Dawa, Eastern Ethiopia (n=334).

Variables		HBsAg Test Result		COR (95%CI)	AOR (95%CI)	p-value
		Pos (%)	Neg (%)			
Marital Status	Married	20(6.9%)	271(93.1%)	1[R]	1[R]	--
	Single	6(24.0%)	19(76.0%)	4.3(1.54, 11.91)	8.5(2.23, 33.04)	0.002
	Divorced or Widowed	2(11.1%)	16(88.9%)	1.7(0.36, 7.89)	4.3(0.79, 23.83)	0.092
Stages of Pregnancy	First TM	19(9.3%)	186(90.7%)	0.96(0.34, 2.70)	--	--
	Second TM	4(5.2%)	73(94.8%)	0.51(0.13, 2.02)	--	--
	Third TM	5(9.6%)	47(90.4%)	1[R]	--	--
Multiple Sexual Partner	Yes	5(23.8%)	16(76.2%)	3.9(1.32, 11.72)	3.8(0.98, 15.17)	0.053
	No	23(7.3%)	290(92.7%)	1[R]	1[R]	--
Tattooing	Yes	6(14.3%)	36(85.7%)	2.0(0.78, 5.38)	1.3(0.39, 4.43)	0.658
	No	22(7.5%)	270(92.5%)	1[R]	1[R]	--
Nose/Ear Piercing	Yes	9(23.7%)	29(76.3%)	4.5(1.88, 10.91)	3.8(1.25, 11.79)	0.018
	No	19(6.4%)	277(93.6%)	1[R]	1[R]	--
Sharing of needles	Yes	1(14.3%)	6(85.7%)	1.8(0.21, 15.95)	4.4(0.36, 54.15)	0.245
	No	27(8.3%)	300(91.7%)	1[R]	1[R]	--
Surgical Procedures	Yes	6(18.2%)	27(81.8%)	2.8(1.05, 7.55)	2.3(0.68, 7.80)	0.177
	No	22(7.3%)	279(92.7%)	1[R]	1[R]	--
History of Blood Transfusion	Yes	6(30.0%)	14(70.0%)	5.7(1.99, 16.25)	6.5(1.65, 26.10)	0.008
	No	22(7.0%)	292(93.0%)	1[R]	1[R]	--
History of Abortion	Yes	10(15.4%)	55(84.6%)	2.5(1.11, 5.79)	2.7(0.94, 7.58)	0.066
	No	18(6.7%)	251(93.3%)	1[R]	1[R]	--
History of Circumcision	Yes	16(13.9%)	99(86.1%)	2.8(1.27, 6.12)*	4.4(1.59, 12.15)	0.004
	No	12(5.5%)	207(94.5%)	1[R]	1[R]	--
HIV Status	Yes	8(47.1%)	9(52.9%)	13.2(4.6, 37.89)	4.1(1.13, 15.09)	0.032
	No	20(6.3%)	297(93.7%)	1[R]	1[R]	--

* is p-value <0.05, COR: Crude Odd Ratio, AOR: Adjusted Odd Ratio, CI: Confidence Interval

Table 4: Bivariate and multivariate analysis of possible risk factors of HBV infection among pregnant mothers in public health facilities in Dire Dawa, Eastern Ethiopia (n=334).

[36]. The observed association might be due to sharing of infected needles during ear/nose piercing among households or neighborhood. Although high (18.2%) HBV infection was detected among 33 pregnant mothers who had history of surgical procedure, statistically significant association was not observed with HBV infection; in contrast with the study findings in Deder hospital and in public hospitals, Ethiopia [21,37]. But it agreed with the study done in Egypt 2010 [38].

Transfusion-transmissible infectious agents such as HBV, HCV, HIV and syphilis are among the greatest threats to blood safety for transfusion recipients and pose a serious public health problem. The current study revealed that out of the total 20 pregnant mothers who had history of blood transfusion, 6 (30%) were infected with HBV and this was significantly associated. Accordingly, pregnant mothers with history of blood transfusion were 6.5 more likely infected than those with no history of blood transfusion {AOR (6.5), 95% CI (1.65, 26.10); p-value (0.008)}. A similar picture was observed in previous studies conducted in Pakistan 2010, in Kano State of Nigeria 2012 and Egypt 2013 [39-41]. One possible justification could be contamination arise from HCWs itself or failure in following aseptic procedure during transfusion at health facility level or transfusion of HBV infected blood due to failure of screening of the donated blood at testing sites. In the present study we noticed higher number 115/334 (34.4%) of participated pregnant women had history of circumcision. Out of these mothers 16 (13.9%) were infected with HBV and this was significantly associated factor. Accordingly, pregnant mothers with history of circumcision were 4.8 times more likely infected than those without circumcision {AOR (4.4), 95% CI (1.59, 12.15); p-value (0.004)}. This finding is supported by a study in Sana'a, Yemen which stated circumcision had significant association with the infection [34].

The antibody test for HIV revealed that the prevalence of HIV in the study area among pregnant mothers attending ANC service was found to be 17 (5.1%). The finding is in line with Ethiopia 2005 reported HIV prevalence of 5.3% but lower than the reported prevalence of 6.6% in Bahir Dar Ethiopia 2014 [42,43]. Similarly, out of the seventeen HIV positive pregnant mothers, 8 (47.1%) had infected with HBV. Hence the prevalence of HIV/HBV co-infection in this study (47.1%) was higher than the study done during 2011 in rural hospital, Ethiopia (0.6%), in Addis Ababa Ethiopia (14.3%), and in Bahir Dar Ethiopia (19%) [43,44]. The observed higher prevalence of HIV/HBV co-infection in the current study can be justified by the fact that in areas where HBV infection is either endemic or intermediate to high (i.e. >8% which is in agreement with 8.4% prevalence in this study), the prevalence rate of HIV/HBV co-infection is recorded as high as 10% to 20%, even the rate can be as high as 20–25% in countries where the viruses are highly endemic [45,46].

In multivariate analysis, having HIV comorbidity increased the risk of having HBV infection more than four times as compared with those who are HIV negative {AOR (4.1), 95% CI (1.13, 15.09); p-value (0.032)}. There are other reports that documented similar findings in Ethiopia [20]. The major justification for the observed association and simultaneous appearance of HBV and HIV might be explained by their nature of sharing similar mode of transmission. In contrary, the study in Dessei reported no significant association between sero-prevalence of HBV and HIV status of the women [19].

Although significant association was not observed in multivariate analysis, pregnant mothers who had one or more history of abortion and those who had experienced multiple sexual practice had higher infection rate and were associated in the crude odd ratio. This finding is

in contrary to previous studies in Bishoftu and Dessei Referral hospital which documented a reverse phenomenon. But our finding is similar in the case of a study at Shashemene that having multiple sex partners was not significantly associated with HBV infection [35].

Conclusion

The sero-prevalence of HBV infection among pregnant mothers in the study area was comparatively higher, which indicates hyper-endemicity and high nature of the infection.

On multivariate analysis, being single pregnant mothers, having nose/ear piercing, history of circumcision, blood transfusion, and HIV co-infection had statistically significant association with positivity of HBV infection. This suggests that being single pregnant mothers, having had invasive procedures like nose/ear piercing and circumcision, history of blood transfusion and or donation as well as HIV co-infection predispose pregnant women for HBV infection compared with the reverse phenomena.

Although association was not significant when adjusted with other variables, in the crude analysis pregnant mothers who experienced multiple sexual practice, who had tattooing, history of previous surgery and abortion showed significant association with sero-positivity of HBsAg.

Recommendations

- To halt spread of these viruses, increasing awareness on modes of transmission should be considered.
- Awareness should be created among parents to avoid sharing of needles for invasive procedures like nose or ear piercing.
- Safety procedures should be followed during blood transfusion at all health facilities.
- Screening all pregnant women for HBV should be made as part of routine antenatal care service in the study area.
- Postpartum HBV immunization of pregnant mothers should be undertaken.
- Interventions should be targeted on reduction of female circumcision by city administrator, regional health bureau and other stakeholders.
- Since higher prevalence of HBV is observed in pregnant mothers, further community-based study should be conducted to determine the exact prevalence of HBV among the general population in the study area.

Ethical Approval

Ethical clearance was obtained from Social and Public Health Research Ethics Review Committee, College of Medicine and Health Sciences, Dire Dawa University. All processes started after safe and sound written permission obtained from Dire Dawa Regional Health Bureau, head of the health facilities and participated pregnant mothers.

Acknowledgement

The authors are grateful to the study participants, data collectors and health facility authorities. Robel Mekonnen was major contributor designed the study, participated in the data collection, analysis, interpretation and write-up, drafted the manuscript and critically revised the manuscript. Dawit Admasu and Meseret Belete participated in the study design, interpretation and write-up. All authors read and approved the final manuscript. This study was supported by Dire Dawa University, Ethiopia.

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