

# Seroprevalence and Associated Factor of hbv Infection Among Pregnant Woman Attending anc at Hidase Health Center Addis Ababa, Ethiopia 2021.

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## Introduction

### Background

Hepatitis B virus is a potentially life-threatening cause of liver disease in the world. It both causes chronic infection and puts people at high risk of death from cirrhosis and liver cancer (1). Globally, it is estimated that more than 2 billion people are still living with HBV infection. Over 350 million are believed to be chronically infected with the virus and are thought to be at a high risk of developing chronic hepatitis, cirrhosis, and primary hepato-cellular carcinoma. About 1.2 million die annually from chronic hepatitis, cirrhosis, and hepatocellular carcinoma (2).

Viral hepatitis during pregnancy is associated with high risk of maternal complications and high rate of vertical transmission. Fetal and neonatal hepatitis acquired from mother during pregnancy lead to impaired cognitive and physical development in latter life of the children (3). The risk of vertical transmission depends on the time at which pregnant woman acquired HBV infection and on her statuses of HBsAg and hepatitis B early antigen (HBeAg) (4). In the absence of immunoprophylaxis 10–20% of women seropositive for HBsAg transmit the virus to their neonates. Vertical transmission rate reaches approximately 90% when women are seropositive for both HBsAg and HBeAg (5).

The prevalence of chronic HBV infection is categorized as high ( $\geq 8\%$ ), intermediate (2–7%), and low ( $< 2\%$ ) (6). In developed countries, the incidence of hepatitis is around 0.1% whereas in developing countries it ranges from 3 to 20% and even higher in some areas. In Africa and Asia, the prevalence of HBV is  $> 8\%$  and 2 billion people have markers of current or past infection with HBV [9]. About half of new infections result from vertical transmission during pregnancy, a statistic that is linked to the fact that HBV screening is not part of routine antenatal care in the area (7).

Immunization is estimated to avert between 2 and 3 million deaths globally each year. In Ethiopia, routine immunization was launched in 1980. Ethiopia has successfully introduced hepatitis B vaccine in the form of pentavalent combination vaccine into the routine schedule in 2007. Children under the age of one year are the target group for the vaccination (8). There is no ideally available treatment for chronic hepatitis B and the other sequelae of HBV infection in the country, and if they are available, this treatment cost falls on the individual patient (9).

In Ethiopia, the prevalence of liver disease is high and accounts for 12% of the hospital admissions and 31% of mortality rate (10). The prevalence of HBV infection among pregnant mothers in Addis Ababa was 7% and 50% had evidence of infection at the age of 20 years (11). In similar studies conducted among pregnant women in Jimma, the prevalence of HBV infection was 3.7% (12) while it was 4.9% and 8.1% among pregnant women in Dessie and Mekelle, respectively.

Several studies around the world recommended that pregnant women should be screened for hepatitis B before delivery, as this offers an opportunity to prevent another generation from being chronically infected by the virus. However, in Ethiopia laboratory diagnosis of HBV infection is not part of routine care in ANC of all health facilities. Moreover, there is little information concerning sero prevalence of HBV infection among pregnant women and the existing data indicate that it differ from region to region, and even at sub regional levels like zonal, Sub-city or woreda levels as indicated above. Therefore, the present study is aimed to estimate seroprevalence of HBV infection and to identify associated risk factors among pregnant women attending ANC in Hidase H/C in Addis Ababa, Ethiopia.

### Statement of the problem

Hepatitis B virus is a hepatotropic deoxyribonucleic acid (DNA) virus which occurs through immune-mediated killing of infected liver cells. It is also recognized as oncogenic virus that can cause a higher risk of developing hepatocellular carcinoma (1). It is 50–100 times more infectious than HIV (10). The infection with the hepatitis B virus can be lifelong, causing cirrhosis (liver scarring), liver cancer, liver failure, and death. It can be acute (with discrete onset of symptoms and jaundice or elevated serum ALT  $> 100$  IU/L or chronic with no symptoms. The rate for chronicity is approximately 5% in adult infections, but it reaches 90% in neonatal infections.

Hepatitis B virus (HBV) is transmitted by vertical transmission, between family members within households by contact of non-intact skin or mucous membrane with secreting or saliva containing, unsafe sexual intercourse, transfusion of HBV infected blood and blood products, perinatal transmission, horizontal transmission, nosocomial infection (commonly transmitted blood-borne virus in the healthcare setting), and percutaneous inoculation (contaminated medical equipment

and sharing of contaminated syringes and needles among injecting drug users) (12). Perinatal and early childhood transmissions are the main routes of HBV infection in endemic areas. The risk of HBV infection transmission decreases where there is periodic perinatal HBV screening, immunoprophylaxis given infants born with HBV infected mother and hepatitis vaccine given both to the high risk mother and the newborn. Therefore, administration of hepatitis B immunoglobulin (HBIG) in combination with hepatitis B vaccines as post exposure prophylaxis is very important since vertical transmission rate is nearly 100%.

The studies conducted in many parts of the globe reported variable prevalence of HBV among pregnant women. Prevalence ranges from 0.1-4.4% in Western Europe (10), 23.7% in Eastern Europe, 20.3% in China, 1.1% in India (11) and average of 18.6% in sub Saharan Africa (5). In Ethiopian study the pooled prevalence of hepatitis B virus infection among pregnant women from a meta analysis was 7% (3,4). In comparison the overall prevalence of HBV among pregnant women in A.A was 6%(11). In addition same study reported positive attitude of responders to be 53.3% while good practice was 43.4%.

As part of reducing maternal and child mortality to achieve one of the millennium development goals (MDGs), Ethiopia rolled out childhood immunization against HBV in 2007. The vaccine is delivered in a pentavalent form as part of expanded program on immunization (EPI) of newborns. Despite this effort, newborns are vaccinated without a prior screening of mothers for underlying hepatitis infection. This study aims to assess the current estimate of HBV infection among pregnant mothers attending one of the antenatal care facilities around Addis Ababa and investigate possible factors for HBV infection.

#### Significance of the study

Hepatitis B virus (HBV) infection is a major public health problem worldwide. HBV is 50 to 100 times more infectious than HIV, and it is an important cause of liver diseases such that chronic infection with HBV is a common cause of death associated with liver failure, cirrhosis, and liver cancer. Viral hepatitis during pregnancy is associated with high risk of maternal complications and high rate of vertical transmission. Several studies around the world recommended that pregnant women should be screened for hepatitis B before delivery, as this offers an opportunity to prevent another generation from being chronically infected by the virus. To ensure this prevalence and factors associated with it will be identified. This assessment will help determine the current picture of Seroprevalence of HBV in Addis Ababa and related factors. It improves our knowledge and will be used as necessary information for health care capacity-building intervention. This study will also be used as an input for health care providers, administrators, patient educators and policymakers to use it as baseline information for further development and possible intervention to avert the gap

## Objective of the Study

### General Objective

To assess Sero-prevalence and associated factor of HBV infection among pregnant woman attending at Hidase health center Addis Ababa, Ethiopia 2021.

### Specific Objectives

The specific objectives of this study are to:

- Assess Sero-prevalence of HBV infection among pregnant woman attending ANC
- Assess associated factor of HBV infection among pregnant woman attending ANC

## Methods and Materials

### Study Area and Period

The study was conducted at Hidase Health center in Addis Ababa city. Addis Ababa, the capital of Ethiopia, which is by far the largest in the country is located in the central part of Ethiopia and belongs to the Western highlands. All sides of the capital city is bordered by Oromiya Regional state, and covers an area of 530 square kilometers (53,000 ha) and a total population of 3,041,002 million persons (CSA, 2011). Addis Ababa has a history of 125 years. Thus, one can say with certainty that it had its earliest beginnings in the mid 1880s and had evolved to be the capital of Ethiopia around 1886/87. In 1986 the city changed its name to Addis Ababa City Municipality and also in 2005 called as Addis Ababa City Administration. Astronomically, Addis Ababa is located at 09002' N Latitude and 38044' E Longitude. It is situated on the foot of escarpment of Mt. Entoto in the North. There are 118 health centers in each woreda in AA. Hidase health center is selected for the purpose of this study.

Hidase health center is a governmental health center under Addis Ababa health bureau, Gullale sub-city. It is one of the eight government owed health centers in Gullale Sub-city and it is also known as Woreda 8 Health center. It is located about three Kms in a road from St. Mary University, behind "kechene medhaniyalem" Church.

This study was conducted in hidase health center from Jun 01, 2021, until Jul 30, 2021. **Study Design**

The descriptive institution-based cross-sectional study design was conducted.

### Population

### Source Population

All pregnant mothers on ANC follow up in Hidase health center.

### Study Population

All pregnant mothers on ANC follow up in Hidase health center fulfilling the inclusion criteria.

### Eligibility Criteria

#### 4.4.1 Inclusion Criteria

- All pregnant mothers on ANC follow up in Hidase health center coming for the followup.

- All pregnant mothers on ANC follow up in Hidase health center willing to participate

#### Exclusion Criteria

- Those mothers with severe pain or other debilitating medical conditions

- Mothers who are transferred to the labor wards.

#### Sample Size Determination and Procedure

##### Sample Size Determination

The sample size calculated using a single proportion formula..A study conducted by Desalegn et al. (2016), about seroprevalence of HBV and associated factors in Addis Ababa reported 6% of prevalence (46). The average of the three variables i.e 44.4% will be taken for computation.

With a 95 % confidence level, a precision of 5%, p-value 6%,  $Z_{\alpha/2} = 1.96$ ,  $d = 0.05$  and 10% non-response rate ,the sample size calculated using the formula;

Sample size (n)

$$n = ((Z_{\alpha/2})^2 \times P(1-P)^2) / (d)^2$$

n=sample size

$Z_{\alpha/2}$  = Standard proportion population at 95% confidence interval (1.96)

P= Estimated proportion of HBV

d=margin of error

$$N = (1.96)^2 \times 0.44 \times 0.56 / (0.05)^2 = 87.$$

Final Sample size will be 171 After taking 10 % non-response rate, the final sample size will be 96.

To mitigate for design effects calculated sample size will be multiplied by design factor (Diff) =2 ; hence final sample size will be 192.

#### Sampling Procedure

Simple random sampling technique was utilized to take the study participants. Among the four weeks of data collection period, the total number of participant's i.e 96 was divided in to 24 each successive weeks of study, so as to keep participants as diverse as possible. Data was collected five working days per week and the first 5 females fulfilling the above inclusion criteria will be selected for interview randomly. A questionnaire prepared in Amharic (Annex 2) will be distributed for participants after informing them about the aim and objectives of the study.

#### Study Variables

##### Dependent Variables

Hepatitis B Surface Antigen Prevalence

##### Independent Variables

Socio-demographic characteristics:

- Age

- Marital status
- Place of residence
- Educational status,

Obstetric history

- Gravidity
- Parity
- Abortion
- Place of delivery

Cultural/cosmetic practice

- Ear piercing
- Ethnic scar
- Tattooing

Medical-Surgical history

- History Surgery
- History of blood transfusion
- Tooth extraction

Sexual history

- Having history multiple sexual partner
- STI

Vaccination

Vaccination against HBV status

#### Data Collection Tool and Procedure

A pre-tested and validated structured questionnaire which is adopted from Dabsu et al. (2018) was used to collect data (12). The tool has shown a good acceptability, reliability and content validity as indicated by good response rate (80–98.3%), high consistencies (Cronbach's Kappa coefficient) ranging from 0.546–0.897 (all  $p < 0.001$ ) (11). The tool consists of three parts of and 30 questions. The first part of the survey contains 9 questions on socio-demographic data and the second part of the survey contains 20 questions to assess the risk factors associated with Hep B virus infection. The Third part contains 3 questions on laboratory parameters to assess prevalence of HBV as well as HIV and HCV. For risk factor questions Score 1 for "Yes" & Score 0 for "No" answers was used.

Data was collected by pre-coded structured questionnaire. To collect the data three Diploma nurses and one supervisor will be trained for 3 days by the principal investigators about how to administer the questionnaire, ethical issues and rights of participants. Those three diploma Nurses will be assigned to the selected health center independently to collect the data. The entire data collection period was supervised by one trained health professional and the principal investigators.

#### Data Analysis and Presentation

The data was coded, entered and cleaned using EPI Data version 3.1 and then exported into SPSS statistical software version 26 for analysis. Descriptive statistical analysis such as simple frequencies, measures of central tendency, and variability measures will be used to describe the characteristics of participants. Then the information was presented using

frequencies, summary measures, tables and figures. Bi-variable and multivariable analysis was used to see the association between each independent variable and the outcome variable, using binary logistic regression Analysis. Chi-square test was done and variables that show P -value of  $\leq 0.05$  with 95% CI was considered statistically significant.

### Ethical Consideration

Ethical clearance was obtained from the Kea med college research committee, College of health sciences, school of nursing, and midwifery. A formal letter from the college was submitted to health center to obtain their cooperation. The goal of the study was explained to the study subjects. At the time of data collection, verbal and written consent was taken to confirm whether they are willing to participate. Those not willing to participate were given the right to do so. Confidentiality of responses was also ensured throughout the research process.

Conducting research in the midst of a global pandemic presents new ethical issues that require reflection and responses. Consequently, there is a great need for guidance to ensure ethical conduct of research. Hence the WHO recommendations referenced annexed under Annex IV was maintained during the process.

### Dissemination plan

This study's findings will be presented to Kea med college, College health sciences school of Nursing and Midwifery, and the hard copy will be available at the library. It will also disseminate to the health center as well as A.A health bureau and finally, it will be published in peer-review journals.

## Results

### Socio-Demographic Characteristics of Participants

A total of 192 mothers following ANC clinic were included for this study, 190 of them responded for the questionnaire, making the response rate of 98.9%. Regarding age of respondents, the minimum and maximum age of respondents was 22 and 38 years respectively. mean while the mean (+SD) age of respondents was 29.2 (+3.4). 99 (51.8%) were from Sululta while the remaining were from Gulale sub city. 118 (61.8%) were urban dwellers, 72 (37.7%) were rural dwellers. 96 (50.3%) of respondents were atleast primary school complete, while only 8 (4.2%) attained higher education. Concerning occupation 143 (74.9%) were doing private jobs while 47 (24.6%) were housewives. 182 (95.3%) of respondents were married. The mean family size was 2.4 with SD of +0.67, the mean (+SD) of number of children alive 0.46 (+0.5). The average (+SD) of income was 3200.00 EtB (+503.43) while income ranged from 2000.00-4500.00 EtB.

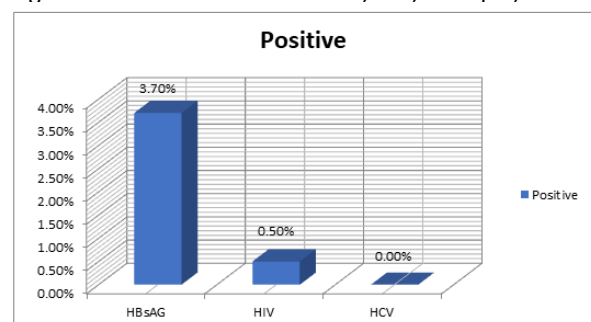
**Table 1:** Socio-Demographic Characteristics of Participants in Hidasse Health center, A.A, 2021 (n = 190).

| Characteristics    |                  | Frequency | Percentage (%) |
|--------------------|------------------|-----------|----------------|
| Age                | 22-26            | 44        | 23.2           |
|                    | 27-31            | 105       | 55.3           |
|                    | 32-36            | 36        | 18.9           |
|                    | >36              | 5         | 2.6            |
| Address            | Gullale S/C      | 91        | 48.2           |
|                    | Sululta          | 99        | 51.8           |
| Residence          | Urban            | 72        | 38.2           |
|                    | Rural            | 118       | 61.8           |
| Educational Status | Illiterate       | 7         | 3.7            |
|                    | Primary school   | 96        | 50.5           |
|                    | Secondary school | 79        | 41.6           |
|                    | Higher Education | 8         | 4.2            |
| Occupation         | Housewife        | 47        | 24.7           |
|                    | Private          | 143       | 75.3           |
| Marital Status     | Divorced         | 1         | 0.5            |
|                    | Married          | 182       | 95.8           |
|                    | Single           | 7         | 3.7            |
| Income             | <2000            | 18        | 9.5            |
|                    | 2000-2500        | 102       | 53.7           |
|                    | 2501-3000        | 37        | 19.5           |
|                    | 3001-3500        | 32        | 16.8           |
|                    | >3500            | 1         | 0.5            |

### Prevalence of Hepatitis B Infection among participants

The overall seroprevalence for HBsAg among the study population was about 3.7 % (7/190). In addition the overall seroprevalence of HIV and HCV were found to be 0.5% (1/190) and 0% respectively.

**Figure 1:** Seroprevalence of HBsAg Among Pregnant women visiting ANC of Hidasse Health center, A.A, Ethiopia, 2021.



## Factors Associated with Hepatitis B Infection among Pregnant Women

Cultural (cosmetic) practices, Medical and Surgical History, Obstetric history, Sexual History and Vaccination against Hepatitis B Virus were assessed with a total of 20 questions. 188 (98.9%) of responders reported to have ear/nose piercing at jewelers shop while only 21 (11.1%) reported to have had tattoo practices. 7 (3.7%) reported dental extraction practices out of health institutions as an adult while, 21 (11.1%) reported extraction in health facilities. Regarding obstetric history, 75 (39.5%) reported to have previous delivery by TBA, 74 (38.9%) of respondents reported Previous delivery at health facility while 21 (11.1%) reported to have had an abortion. Only one (0.5%) of study participant had history of home delivery, while 3 (1.6%) had previous delivery with Caesarian section. Regarding contraceptive use, only 17 (8.9%) had previous history of using loop contraceptive; in contrast, 85 (44.7%) had history of using injectable contraceptives.

Only 4 (2.1%) of participants had previous admission for any surgical condition while 2 (1.1%) had surgical procedure. 5 individuals (2.6%) had previous history of venipuncture for treatment. Only one respondent (0.5%) had prior history of blood transfusion; to the contrary, 13 (6.8%) had previous contact with jaundiced person.

17 (8.6%) of the study participants reported to have had history of multiple sexual partners. Despite that, only 13 (6.8%) reported to have had previous history of sexually transmitted illnesses that was diagnosed and treated by a physician. Table 2 summarizes the factors associated with hepatitis B infection considered for the purpose of this study.

**Table 2:** Frequency Distribution of Associated Factors with Seroprevalence of HBsAg Infection among Hidase Health Center, Addis Ababa, Ethiopia 2021 (N=190)

| Characteristics                       |     | Frequency | Percentage (%) |
|---------------------------------------|-----|-----------|----------------|
| Ear/Nose piercing (in jeweler's shop) | No  | 2         | 1.1            |
|                                       | Yes | 188       | 98.9           |
| Tattooing on body                     | No  | 169       | 88.9           |
|                                       | Yes | 21        | 11.1           |
| Dental extraction at home             | No  | 183       | 96.3           |
|                                       | Yes | 7         | 3.7            |
| Dental extraction at health facility  | No  | 169       | 88.9           |
|                                       | Yes | 21        | 11.1           |
| Circumcision (FGM)                    | No  | 190       | 100            |
|                                       | Yes | 0         | 0              |

|   |     |     |      |
|---|-----|-----|------|
| Shaving Practices                         | No  | 106 | 55.8 |
|   | Yes | 84  | 44.2 |
| Delivery by TBA (trained birth attendant) | No  | 115 | 60.5 |
|   | Yes | 75  | 39.5 |
| Previous delivery at health facility      | No  | 116 | 61.1 |
|   | Yes | 74  | 38.9 |
| Abortion                                  | No  | 169 | 88.9 |
|   | Yes | 21  | 11.1 |
| Previous hospital admission               | No  | 186 | 97.9 |
|   | Yes | 4   | 2.1  |
| Surgical procedure                        | No  | 188 | 98.9 |
|   | Yes | 2   | 1.1  |
| Receiving blood transfusion               | No  | 189 | 99.5 |
|   | Yes | 1   | 0.5  |
| History of Contact with jaundiced         | No  | 177 | 93.2 |
|   | Yes | 13  | 6.8  |
| Home delivery                             | No  | 189 | 99.5 |
|   | Yes | 1   | 0.5  |
| Previous Caesarian section                | No  | 187 | 98.4 |
|   | Yes | 3   | 1.6  |
| Using Loop contraceptive                  | No  | 173 | 91.1 |
|   | Yes | 17  | 8.9  |
| Injectable contraceptive                  | No  | 105 | 55.3 |
|   | Yes | 85  | 44.7 |
| Venous or body piercing for treatment     | No  | 185 | 97.4 |
|   | Yes | 5   | 2.6  |
| Multiple Sexual partners                  | No  | 172 | 90.5 |
|   | Yes | 17  | 8.9  |
| History of STD (Venereal disease)         | No  | 177 | 93.2 |
|   | Yes | 13  | 6.8  |



## Association between Dependant variables and Independent variables

I. Logistic Regression analysis of Seroprevalence of HBsAg with related variables

Bivariable and Multivariable logistic regression analysis used to identify the factors that are associated with Hepatitis B infection. On Bivariable logistic regression analysis all socio-demographic variables (Address, Income, Living Area, Educational background, Occupation and Marital status) were not significantly associated with Hepatitis B Virus Infection as assessed with sero-prevalence at p-value <0.05 with 95% C.I. On the contrary Older Age group was found to have significant correlation with Hep B infection with [COR=0.083; 95%CI (0.011-0.66)].

The variable that was found to be statistically significantly related with Hepatitis B infection was Dental extraction practices outside of health institutions, Delivery through TBA, Previous delivery at a health institution, Previous contact with jaundiced person, Previous venipunctures for procedures.

Dental extraction works out side health facilities (usually at home) was found to be significantly correlated with Hep B Infection with [COR=0.03; 95%CI (0.005-0.179)]. Delivery practices at any places outside health institutions with or without the presence of TBA were also significantly associated with Hep B infection with [COR=0.101; 95%CI (0.012-0.856)]. Interestingly previous delivery at health institutions were also found to have significant correlation with Hep B Infection with [COR=0.099; 95%CI (0.012-0.836)].

Previous contact of our responders with Jaundiced individuals also revealed significant association with Hep B infection with [COR=0.018; 95%CI (0.003-0.109)]. Finally, Previous history of venous or body piercing for treatment were found to be correlated with Hepatitis B infection with [COR=0.042; 95%CI (0.006-0.307)].

After Bivariate analysis, only those variables, which were significantly, associated (p- value < 0.02) with Hep B Infection was entered for further multivariate analysis. By adjusting potential confounders in multivariate logistic regression analysis, Study participants who happen to have previous encounter/contact with Jaundiced individuals were found to have significant association with [AOR=0.027; 95% C.I (0.003-0.208)]. Table 3 summarizes the regression findings.

**Table 3:** Association Between Socio-Demographic Factors With Seroprevalence of HBsAg At Hidassie H.C, A.A, Ethiopia, 2021 (n=190).

| Variable     | Seroprevalence of HBsAg |     | Odds Ratio at (95% CI) |         |             |         |
|--------------|-------------------------|-----|------------------------|---------|-------------|---------|
|              | Neg                     | Pos | COR (95%CI)            | P-Value | AOR (95%CI) | P-Value |
| Age in years |                         |     |                        |         |             |         |
| 22-26        | 44                      | 0   | 1                      |         |             |         |

|                        |     |   |                  |       |                 |       |
|------------------------|-----|---|------------------|-------|-----------------|-------|
| 27-31                  | 105 | 0 | 0.00(0.00-)      | 0.997 | 0.00(0.00-)     | 0.997 |
| 32-36                  | 32  | 4 | 0.00(0.00-6.49)  | 0.996 | 0.00(0.00-)     | 0.993 |
| >36                    | 2   | 3 | 0.08(0.01-0.66)* | 0.019 | 0.15(0.01-2.95) | 0.209 |
| Address                |     |   |                  |       |                 |       |
| Gullale S/C            | 94  | 5 | 2.4(0.45-12.51)  | 0.311 |                 |       |
| Sululta                | 89  | 2 | 1                |       |                 |       |
| Residence              |     |   |                  |       |                 |       |
| Urban                  | 67  | 5 | 4.33(0.82-22.9)  | 0.085 |                 |       |
| Rural                  | 116 | 2 | 1                |       |                 |       |
| Educational Background |     |   |                  |       |                 |       |
| Illiterate             | 7   | 0 | 1.27(0.00-1.5)*  | 0.99  |                 |       |
| Primary school         | 89  | 7 | 1.0(0.00-)       | 1     |                 |       |
| Secondary school       | 79  | 0 | 1.0(0.00-)       | 1     |                 |       |
| Higher Education       | 8   | 0 | 1                |       |                 |       |
| Occupation             |     |   |                  |       |                 |       |
| House wife             | 140 | 3 | 1.71(1.03-7.57)* | 0.01  |                 |       |
| Private                | 43  | 4 | 1                |       |                 |       |
| Marital Status         |     |   |                  |       |                 |       |
| Divorced               | 7   | 0 | 2.3(0.9-6.1)*    | 0.05  |                 |       |
| Married                | 175 | 7 | 0.41(0.37-3.9)   | 0.41  |                 |       |
| Single                 | 1   | 0 | 1                |       |                 |       |
| Income                 |     |   |                  |       |                 |       |
| <2000                  | 18  | 0 | 1                |       |                 |       |
| 2000-2500              | 99  | 3 | 4.8(0.00-)       | 0.99  |                 |       |
| 2501-3000              | 34  | 3 | 1.4(0.00-)       | 0.99  |                 |       |
| 3001-3500              | 31  | 1 | 5.2(0.00-)       | 0.99  |                 |       |
| >3500                  | 1   | 0 | 1                | 1     |                 |       |

## Discussion

This study aimed to assess Seroprevalence of HBsAg and associated factors among pregnant mothers attending ANC at Hiddase Health Center, Addis Ababa, Ethiopia.

Findings of this study revealed that overall seroprevalence for HBsAg among the study population was about 3.7 % (7/190). Whereas the studies conducted at an International level in China (11) and Yemen (12) showed a sero-prevalence of 5.49% and 10.8% respectively. This discrepancy might be due socio-demographic as well as economic differences, Study time gap and study setting difference. While at the sub Saharan African level sero- prevalence of HBsAG among mothers following ANC was 5.15%, 10.2%, 7.9%, 8.3%, 7.7%, 8%, 11.8% and 11% from West African pooled report (2), Cameroon (3), Nigeria (4), South Western Nigeria (3), Ghana (5), Mali (6), Uganda (7) and South Sudan (8) Respectively. Apart from study design difference and difference in socio economic status, these can be due to better health literacy among our study participants; better health literacy of a society is usually the direct outcome of the health policy a country is following.

At a national level, Pooled report from Ethiopian studies, Study from Tigray (3), Gambella (7), Dadar- Oromiya (5) and A.A (5,6) reported that 7%, 5.5%, 7.9%, 6.9% and 6% of Participating mothers were respectively found to have positive Seroprevalence of HBsAg. The discrepancy could be as a result of difference in sociodemographic nature of participants, the relatively better health literacy of our participants which could be attributed to their urban area of residency. As mentioned above, health policy of a country and its implementation also plays a role in minimizing the prevalence of Hepatitis B virus infection. Hepatitis B infection was thematic strategic focus area as per the FMOH, and it is included in the ANC follow up of pregnant women in Ethiopia. This implies the responsibility of hospital management as well as federal and regional policy makers for providing the Knowledge and skills development program while updating the knowledge of the mothers towards Hepatitis B Infection. There is a need to update the knowledge of mothers, training through mass medias is essential and should be integrated into their lives regularly.

A review conducted in Korea (5), pooled report from sub-saharan Africa (2), Kenya (3), Eriteria (4) from International and Regional sources; while from Arbaminch (13), Atat (12), Dawro (10) and Amhara districts (11) from National sources reveled Sero-prevalence to be 3.32%, 3.3%, 3.8%, 3.6%, 4.3%, 4.5%, 3.5% and 3.8% respectively. These findings go in congruent with findings from our study. This could be as a result of similarity in Sociodemographic status, public health measures to control infectious diseases, similar health literacy of the society, the similarity in hepatitis epidemiology, tribal practices, traditional operation, sexual practices, and medical exposure for the potential risk factors of HBV infection. This will call for future research to identify the cause of the significant difference and other related factors in the study area.

Most International studies from North India, South India, Spain, Haiti and Turkey revealed sero-prevalence of 1.1%, 1.01%, 0.42%, 2.5% and 2.1% respectively. This might be owing to previous awareness creation made regarding hepatitis B transmission.

Older Age group was found to have significant correlation with Hep B infection with [COR=0.083; 95%CI (0.011-0.66)] in our study. Older age group was found to be 8.3% more infected with Hep B compared with their younger compatriots. Older age was a significant risk factor for HBV infection in many studies. An Indian study revealed, Highest prevalence was in age group 26-30(46%) followed by age group 31-35(30.8%) (1), that was reinforced by another study from India that stated Most common age group with HBV infection was 25–30 years (12). Similarly, A 2018 survey from Haiti showed, Women aged 30 and older had more than double the odds of positive total anti-HBc than women aged 15–19 years ( $p < 0.001$ ) (13). Coming to western Africa, a study from western Nigeria showed the highest HBV infection rate occurred in 25-29 year age group (3). This could be due to increment of probability as well as other risk factors also increases as age increases. In addition, the younger generation might also have better health literacy and infectious disease prevention cultural behaviors than their older counterparts.

Our study revealed, Participants undergoing dental extraction out of health institutions to have 3% more likely to develop Hep B infection that their counter parts, similarly those who have history of delivery out of health institutions were also found to have 10.1% more likely hood to be infected with Hep B. Similarly a 2019 Hospital based cross sectional study from Atat, Ethiopia reported that, the prevalence of hepatitis B virus infections was significantly higher among those with home delivery by traditional birth attendants (adjusted odds ratio = 9.06; 95% confidence interval = 2.01–13.36,  $p = 0.005$ ). The results reveal even though myriad of activities has been done by the Ethiopian Government home delivery and it's health sequels remains to be a challenge.

In addition, previous history of contact with jaundiced patient, usually history of household/close contact was found to be a risk factor in our study. The findings in this study also suggest that, 2% more mothers with Hep B infection were found to have previous contact with jaundiced family member attending them. Similarly, a Turkish study revealed, a history of household/close contact (AOR = 11.10, 95% CI = 1.56-78.65,  $p = 0.016$ ) were significantly associated with the risk of HBV infection (19). While from eastern Africa, a study from juba reported Significant risk factors for Hepatitis B infection history of Jaundice (OR 1.7 and CI of 1.2-2.1) (7). A 2017 Cross sectional study from Northern Ethiopian regions, zones of Tigay revealed, those who had HBV-infected person in their family (AoR = 8, 95%CI, 1-58,  $P = 0.02$ ) were found to have higher risk of HBV infection.

## Conclusion

The prevalence of HBsAg carrier rate of pregnant women in the study area falls within the medium/intermediate endemic according to the criteria set by WHO. Study participants who

were in older age group were significantly affected with HBV. Previous contact with family/close contact with jaundiced person, non-institutional dental extraction, non-institutional deliver and previous treatments requiring venipunctures were also found to significantly affect the prevalence of HBV. Therefore, initiating screening tests during follow up period for antenatal care services is mandatory. And further study with a large scale sample size on HBsAg positivity is required to enrich the data in the study are

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