SERO-PREVALENCE AND ASSOCIATED FACTORS OF HEPATITIS-B VIRUS INFECTION AMONG ATTENDANTS OF OUT PATIENT CLINIC AT HAMDI MEDICAL AND SURGICAL SPECIALITY CENTER, HARAR TOWN EASTERN ETHIOPIA

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A RESEARCH THESIS SUBMITTED TO JIMMA UNIVERSITY, COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCES, DEPARTMENT OF INTERNAL MEDICINE; IN PARTIAL FULFILLMENT FOR THE REQUIREMENTS OF CERTIFICATE OF SPECIALITY IN INTERNAL MEDICINE

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JIMMA, ETHIOPIA

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Abstract

Background: Untreated chronic viral hepatitis can progress to life-threatening complications. Ethiopia is considered as hyper endemic region with HBV infection according to WHO , nevertheless, the clinical and public health burdens due to viral hepatitis in general are still given no emphasis in the country's health system including vaccinations and treatment for adults. This study is aimed to determine the prevalence and assess the associated risk factors of hepatitis virus infection among clients attending outpatient clinic of Hamdi medical and surgical specialty center, Harar town, Ethiopia.

Objective: The purpose of the study is to determine the seroprevalence and associated factors of hepatitis B virus infection among adult attendants of Hamdi medical and surgical specialty center, Harar town, Eastern Ethiopia, 2019.

Method and materials: Institution based cross sectional study design was used. Structured closed ended questionnaire was used to collect data using interviewer administered technique.Univariate and multivariate logistuc regression used to assess associated factors with seropositivity for HBV infection. The study was conducted between December 2019 and January 2020.

Results: A total of 320 adult patients attending at Hamdi medical and surgical specialty center outpatient department were enrolled in the study. The overall seroprevalence of hepatitis B virus infection detected was 10.6%. Sixty two (19.4%) of the participants gave history of sexually transmitted infection. There was a statistically significant association between, history of any contact with jaundiced patient, tattooing, history of sexually transmitted infection with Seropositivity for HBV infection. Those participants having previous history of contact with jaundice patient were about five times more seropositive for HBV infection when compared with those with out any contact history (AOR: 5.59, 95% CI:(1.59, 19.6), p= 0.007).

Conclusion: The seroprevalence of HBV infection is high**.** History of any contact with jaundiced patient, tattooing and sexually transmitted infection were associated with seropositivity for HBV infection.

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Acronyms & Abbreviations

AIDS	Acquired immune deficiency syndrome
ANC	Antenatal care
CDC	Centers for Disease Control and Prevention
DALY	disability-adjusted life-year
DHS	Demographic and Health Survey
EDHS	Ethiopian Demographic and Health Survey
EIA	enzyme immunoassay
EPI	Expanded Programme of Immunization
HAV	hepatitis A virus
HBeAg	hepatitis B e antigen
HBsAg	hepatitis B surface antigen
HBV	hepatitis B virus
HCV	hepatitis C virus
HDV	hepatitis D virus
HEV	hepatitis E virus
HIV	Human Immunodeficiency Virus
MSM	men who have sex with men
NTD	Neglected Tropical Diseases
PMTCT	prevention of mother-to-child transmission
SSA	Sub-Saharan Africa
WHO	World Health Organization

1. INTRODUCTION

1.1 Background

Five viruses are responsible for most cases of viral hepatitis, which is an inflammation of the liver due to a viral infection. However, only hepatitis-B virus (HBV), hepatitis-C virus (HCV) and hepatitis-D virus (HDV) frequently cause chronic hepatitis, which can lead to progressive scarring of the liver (cirrhosis) and to primary liver cancer (hepatocellular carcinoma). Of these, HBV and HCV cause 96% of the mortality from viral hepatitis (1).

Hepatitis B is transmitted when blood, semen, or another body fluid from a person infected with the HBV virus enters the body of someone who is not infected. This can happen through sexual contact; sharing needles, syringes, or other drug-injection equipment; or from mother to baby at birth (2).

For some people, HBV is an acute, or short-term, illness; but for others, it can become a long-term, chronic infection. Risk for chronic infection is related to age at infection: approximately 90% of infected infants become chronically infected, compared with 2%–6% of adults. Chronic HBV can lead to serious health issues, like cirrhosis or liver cancer (2).

An early win in the global response to viral hepatitis was achieved through the effective scaling up of hepatitis B vaccine. In 2015, global coverage with the three doses of hepatitis B vaccine in infancy reached 84%. This has substantially reduced HBV transmission in the first five years of life, as reflected by the reduction in HBV prevalence among children to 1.3%. However, coverage with the initial birth dose vaccination is still low at 39% (3). Other prevention interventions are available but insufficiently implemented. There are several antiviral treatments available for chronic HBV infection and everyone with chronic HBV should be linked to care, considered for treatment, and regularly checked for liver damage and liver cancer (4, 5).
Ethiopia is considered in hyper endemic region with HBV infection according to WHO , nevertheless, the clinical and public health burdens due to viral hepatitis in general are still given no emphasis in the country's health system including vaccinations and treatment for adults (1, 3).

1.2 Statement of the problem

According to WHO 2017 Global hepatitis report, 1.1 million people newly infected with chronic hepatitis B (1) and in 2015 estimate, globally 257 million people living with chronic hepatitis B virus infection which account 3.5% of the population (6). The African and Western Pacific regions accounted for 68% of those infected.

Viral hepatitis caused 1.34 million deaths in 2015, a number comparable to deaths caused by tuberculosis and higher than those caused by HIV. However, the number of deaths due to viral hepatitis is increasing over time, while mortality caused by tuberculosis and HIV is declining. Most viral hepatitis deaths in 2015 were due to chronic liver disease (720 000 deaths due to cirrhosis) and primary liver cancer (470 000 deaths due to hepatocellular carcinoma) (7).
According to a review done in Ethiopia in 2016, the overall prevalence of hepatitis B virus (HBV) was 7.4% (95%CI: 6.5–8.4). The pooled prevalence among subgroups showed 5.2% (95%CI: 3.7–7.4) in human immunodeficiency virus (HIV) infected individuals, 8.0% (95%CI: 5.9–10.7) in community based studies, 8.4% (95%CI: 5.4–12.7) in blood donors, 11.0% (95%CI: 7.5–15.9) in immigrants and 6.9% (95%CI: 5.6–8.5) in other groups (8).

Risky traditional unsafe practices (tattooing, ear piercing, tonsillectomy, circumcision, ritual scars, traditional surgery, unsterilized shaving at the barber shop, dental extraction at home, home delivery by traditional birth attendants, unsafe abortion practices) were indicated in the associated factors (8).

Persons infected with HBV or HCV are usually unaware of their infection, as they do not have well-defined symptoms before complications emerge. Untreated chronic viral hepatitis can progress to life-threatening complications. Depending on life expectancy, 20% or more of those with chronic infection develop end-stage chronic liver disease, such as cirrhosis or hepatocellular carcinoma. Cofactors (e.g. alcohol, HIV infection) can accelerate progression towards end-stage liver disease. Cirrhosis and hepatocellular carcinoma are life-threatening conditions (1, 3).

Most of the burden of disease from HBV infection comes from infections acquired before the age of 5 years (9). Therefore, prevention of HBV infection focuses on children under 5 years of age. The United Nations selected the cumulative incidence of chronic HBV infection at 5 years of age as an indicator of the Sustainable Development Goal target for "combating hepatitis" (10).

The low incidence of chronic HBV infection in children less than 5 years of age at present can be attributed to the widespread use of hepatitis B vaccine. Worldwide, in 2015, the estimated prevalence of HBV infection in this age group was about 1.3%, compared with about 4.7% in the pre-vaccination era (which, according to the year of introduction can range from the 1980s to the early 2000s) (11).

However, the prevalence was still 3% in the African Region. This fall in the incidence of chronic HBV infections among children means that in the long term, the global hepatitis B epidemic will decline. However, deaths among infected adults born before the era of vaccination will continue to increase if they are not diagnosed and treated (12).

WHO committed to eliminating viral hepatitis as a public health threat by 2030 (defined as a 65% reduction in mortality and a 90% reduction in incidence compared with the 2015 baseline (12). Elimination can be achieved through sufficient service coverage of five synergistic prevention and treatment interventions. These are (i) immunization against hepatitis B, (ii) prevention of mother-to-child transmission of HBV, (iii) blood and injection safety,(iv) prevention of transmission of HBV and HCV among persons who inject drugs through comprehensive harm reduction services, and (v) testing and treatment (13).

However, recent reports estimate that only 27 million (10%) people living with hepatitis B knew their hepatitis B status and 4.5 million (17%) of the people diagnosed with hepatitis B received treatment. Only 0.3 % of infected individuals are diagnoses in African regions (1, 3, 7).

Access to affordable hepatitis testing is limited. Few people with viral hepatitis have been diagnosed (9% of HBV-infected persons, and 20% of HCV-infected persons). Among those diagnosed, treatment has reached only a small fraction. In 2015, 8% of those diagnosed with HBV infection or 1.7 million persons were on treatment (11, 14).

Despite the global direction towards testing and treatment of viral hepatitis, especially for adult population where most of the people currently living with HBV infection are persons born before hepatitis B vaccine was widely available and used in infancy, the current clinical practice in Ethiopia is limiting. There are also variable prevalence reports within different geographical location in the country requiring further epidemiologic studies. Therefore this study is aimed at determining prevalence and associated factors of HBV infection among adult outpatient visitors at a private medical center in Harar town, Eastern Ethiopia.

2. LITRATURE REVIEW

2.1 Seroprevalence of Hepatitis B virus infection

A study from Poland estimated that one in ten of asymptomatic randomly selected adult patients from primary care clinics, presented a serological marker of HBV infection, which shows that in Poland HBV remains a serious public health threat on the community level. Serum samples were assayed for antiHBc total and anti-HBs with enzyme immunoassay. The prevalence of antiHBc total among 410 participants (median age 56 years) was 10.3 % (95 % CI 7.6–13.8 %) (15).

In 2013, finding from population based study in Philippine showed that from a total of 2150 randomly selected adults, 20 years and over, HBsAg seroprevalence was 16.7% (95%CI: 14.3%-19.1%) (16).

A community based study in China showed prevalence of hepatitis B surface antigen (HBsAg) in the total population of 8.76%. HBsAg prevalence was lowest (0.29%) among children aged 0–12 years and highest (12.71%) among those aged 23–59 years. Moreover, the prevalence (8.82%) in males approximately equaled that (8.65%) in females ($P > 0.05$) (17).

Young adult males with age range 17–22 years from different districts of Pakistan were screened for hepatitis B surface antigens (HBsAg) and anti-hepatitis C antibodies (anti-HCV). Out of 5707 young men tested, 95 (1.70%) were positive for anti-HCV and 167 (2.93%) for HBsAg. Although both viruses were distributed evenly throughout Pakistan, seroprevalence was higher in the provinces of Punjab and Singh than in North-West Frontier Province and Baluchistan and Azad Kashmir provinces (18). A study in Morocco in 2013, HBV seropositivity was documented in 1.81% out of 41269 and 23578 participants respectively from the general population (19).

In Kenya, a number of seroepidemiological studies show a high prevalence of HBV infection, with HBsAg carrier rates ranging from 5 to 30%.18-20 One early study in a rural community in Kenya, using the counter electrophoresis method of testing, showed an HBsAg carrier rate of 5

1%.18 Antigenaemia occurred first in early childhood, reaching a peak of 10-1% at 14 years and then declining to less than 1% in those older than 60 years (20).

In Ethiopia, the magnitude of HBsAg seroprevalence from the community based studies in 2003 was 6.2% (21) and 5.3% in 2007 (22). However, studies conducted in blood donors reported a slightly higher median prevalence of 8.7% (IQR = 4.6–16.9) than the 6.2% median (IQR = 5.6–9.9) prevalence rate in the community based studies (23).

The HBsAg was also reported among various segments of the society such as healthcare professionals (9.0%) (24), outpatient and inpatient department attendants (4.7–7.4%) (25, 26), diabetic patients (3.7%), HIV VCT centers clients (5.7%) (27) and commercial sex workers (6.0%) (28). Overall, the median HBsAg prevalence in the general population showed 6.3% (IQR = 5.2–10.8) over the last five decades (23).

A study of HBV seroprevalence among outpatient attendants at Goba Hospital, Ethiopia, was 26 (7.4%). Prevalence of Hepatitis B and Human Immuno Deficiency Virus Co-infection was about 9 (42.3%) and about 17 (5.1%) of Human Immuno Deficiency Virus negative subjects were positive for Hepatitis B surface Antigen (26). A high prevalence of HBV and HCV among chronic hepatitis patients were found in a study from Bale Robe, 22.3% and 3.6% respectively (29).

A study from northern Ethiopia, in 2012, 30.8 % were seropositive for HBV. The majority of the patients who visited the hospital for HBV screening were in the 15 to 45 age group. Likewise the seroprevalence of HBV was also higher among this group, 40/198 (20.2 %). With regard to sex, HBV infection was higher in males compared to females, (19.2 %) and (11.6 %) respectively. In 2014, only 15 /150 (10 %) of them were found to be seropositive for HBsAg. As in the previous years, the prevalence of HBV in males was higher than females, 7 (4.67 %) and 8 (5.33 %) respectively. The overall seroprevalence of HBsAg in the years 2012 to 2014 was 21.2 %. The seroprevalence in males was higher than in females, 22.8 % and 19.1 % respectively (30).

A study in Gondar on clinical suspects of Hepatitis, overall prevalence of HBV and HCV was 14.6% and 12.41% respectively. There was significant difference among gender with p value of 0.011 for HBV (male=7.9%, female=6.3%). The majority of infected individuals were aged 15–

34 years old for both HBV and HCV infection with p-value 0.36 and <0.001 respectively (31). Community seroprevalence of hepatitis B virus in adult population in Gojjam zones, northwest Ethiopia, revealed a prevalence of HBV of 3.1% (32).

2.2 Risk factors associated with HBV infection

From a population based study of Philippine There was no significant difference between males and females (17.5% vs 16.0%; P =0.555). The HBsAg seroprevalence peaked at age 20-39 years old, with declining prevalence in the older age groups. The only independent predictor of HBsAg seropositivity was the annual income, with persons in the highest income quartile being less likely to be HBsAg positive (age-adjusted OR = 0.51; 95%CI: 0.30-0.86) compared to subjects in the lowest income quartile. Sex, marital status, educational attainment, and employment status were not found to be independent predictors of HBsAg seropositivity (16).

Older Many studies have suggested that HBV transmission in Africa occurs predominantly in childhood, by the horizontal rather than the perinatal route. The exact mode of transmission is uncertain but probably involves percutaneous infection through saliva or traces of blood, as well through unsterile needles, tribal scarification, and other possible vehicles (20).

A study in Morocco found that seroprevalence of HBV infection increased with age; the highest prevalence was observed among subjects with >50 years old (3.12%). Various risk factors for acquiring infection were identified; age, dental treatment, use of glass syringes and surgical history. In addition to these factors, gender and sexual risk behaviors were found to be associated with higher prevalence of hepatitis B. The HBV positivity was significantly higher among males than females participants in all age groups ($P < 0.01$). The peak was noticed among males aged 30–49 years (2.4%) (19).

In 2016 finding from China showed as, vaccination was effective in preventing HBV infection, regardless of age. Among adults aged 23–59 years, male sex tended to keep the HBsAg persistence. However, reduced persistence for participants with occasional physical exercise and drinking was observed. For participants older than 59 years, a history of prior surgery placed people at high risk for infection (17).

From early study in Kenya One point of particular interest was the finding of a strong interfamilial spread of HBV 18. A more recent study has shown no significant perinatal transmission. Instead, HBV transmission was found to be largely horizontal with the first peak occurring in early school age and a second peak during puberty and childbearing age (33).
The predominant form of HBV transmission in Ethiopia was found to be horizontal interfamilial spread, with factors such as tattooing, tonsillectomy, circumcision, and ear piercing using unsterile instruments possibly playing a part (34).

A previous study in South Africa among urban black children in Soweto, Johannesburg, HBsAg was detected in 0.97% of the children, by contrast, about 15% of black children from the rural areas of South Africa were found to chronically infected. This remarkable difference in the HBV carrier rate between urban and rural black children in South Africa offers a unique opportunity to investigate the unfavorable influences operating in a rural environment. In rural areas, which are invariably of lower socioeconomic status, there are a number of factors that could play a part in the significantly higher HBV infection rates. These include poorer hygiene, with greater chances of HBV transmission through skin abrasions, the use of unsterile needles, tribal scarification, insect bites, and many others. They may also play a part in horizontal transmission of HBV in other areas of sub-Saharan Africa (35).

In Northern Ethiopia a three year seroprevalence of HBsAg was higher in males than in females and the yearly prevalence decreases from 2012–2014 (30). A study on outpatient visitors at Goba hospital, south west Ethiopia, found risk factors like, hospital admission, multiple sexual partners, HIV status, and unsafe drug injection were found to have significant association with Hepatitis B surface Antigen on binary logistic regression. However, multiple sexual partners and being positive for Human Immuno Deficiency Virus infection were the only significantly associated with Hepatitis B Virus on multivariable logistic regression (26).

In a study among pregnant women southern Ethiopia, those with history of multiple sexual partners and being HIV positive were significantly associated with HBsAg positivity. Among the study participants, 35.4% were aware of MTCT of HBV and only 12 (2.5%) have taken HBV vaccine (36).

Sex and age had statistically significant association with Hepatitis B virus infections where females were less likely to be infected. As age increases above 20 years, the risk of infection with Hepatitis B Virus increases (37). Participants earning 581-1,300 birr were 32.2% less likely to have infection than participants earning below 580 birr per month. Volunteer blood donors who exposed to unsafe therapeutic drug injection were 11 times increased risk of HBV infection (38).

2.3. Significance of the Study

A majority of studies conducted elsewhere identified viral hepatitis as a major risk factor for development of chronic liver disease, and is not curable after the disease progresses to end stage and not economical for individuals in developing countries like Ethiopia.

This study is aimed to determine the seroprevalence and associated factors of hepatitis B virus infection among attendants of Hamdi medical and surgical specialty center, Harar town, Eastern Ethiopia.

Therefore determining the prevalence and their related factors of infection the primary step for indicating the necessity of identifying patients eligible for treatment and also helpful for informing health care workers about the level of magnitude in the patients, as there might be difference in magnitude from locality to locality. It can be considered as screening for patients visiting health care and at least health education can be transferred on reduction of transmission.

The finding of the study magnitude and related factors of HBV infection which will provide information on the extent the local prevalence among randomly selected adult patients which can be utilized for the evidence- based decision to develop control measures and preventive strategies.

3. OBJECTIVES OF THE STUDY

3.1 General objective

To determine the prevalence and associated factors of hepatitis B virus infection among adult attendant of Hamdi specialty center, Harar, Eastern Ethiopia, 2019.

3.2 Specific objectives

1. To determine the seroprevalence of HBV infection among adult outpatient attendant of Hamdi specialty center, Harar, Eastern Ethiopia, 2019
2. To assess associated factors of HBV infection among outpatient attendant at Hamdi specialty center, Harar, Eastern Ethiopia, 2019

4. METHODS AND MATERIALS

4.1 Study area and period

This study conducted at Hamdi medical and surgical specialty center which is located in Harar Town, Eastern Ethiopia. Harar town is located 400 km east of the capital city Addis Ababa. Hamdi medical and surgical center was established in 2017 with the aim serving the town and surrounding population giving services like outpatient, emergency, general surgery, internal medicine and radiology are given. There are also well established laboratory services. The data was collected from December 1 2019 to January 15 2020.

4.2 Study Design

A health facility based cross sectional study design was used.

4.3 Population

4.3.1 Source population

All patients attending outpatient department of Hamdi specialty center.

4.3.2 Study population

Adult patients attending OPD at clinic during the study period who met the inclusion criteria.

4.3.3 Study unit

Adult patents attending OPD at the clinic.

4.4 Eligibility criteria

4.4.1 Inclusion criteria

- Resident in Harar town and surrounding kebeles
- Adult patients greater than 15 years old

4.4.2 Exclusion criteria

- Patients with mental health problems
- Hearing impairments or any other serious health problems where communication is not possible
- Those who refuse to participate
- Those vaccinated for HBV

4.5 Sample size determination and sampling technique

4.5.1 Sample size determination

The required sample size is calculated based on the prevalence rate of 7.4% of HBV seroprevalence reported from southern Ethiopia (26). The required sample size is computed using single population proportion formula,

$$n = \frac{(Z_{\alpha/2})^2 p(1-p)}{d^2} = \frac{(1.96)^2 * 0.074 * (1-0.074)}{(0.03)^2} = 292$$

Where, P= Estimated proportion of HBV infection (7.4%)

$Z_{\alpha/2}$= Critical value at 95% level of confidence (Z =1.96)

d= Margin of error (3%), the calculated sample size = 292. After adding 10% non response rate the final sample size was 320.

4.5.2 Sampling technique

A systematic random sampling technique used considering the average number of patients attending the clinic per day of 30-40. Since the sample collection period for the study is for one

months the total number of patients that attend the clinic (N) 1000. To determine the sampling interval (K), the following formula is used, K = N/n = 1000/320 = 3.1, so every 3rd client that comes to the clinic from *December 1 2019 to January 15 2020* included in the study until the required sample is achieved.

4.6 Study Variables

Dependent variable

- Hepatitis-B virus infection

Independent Variables

- Age
- Sex
- Residence
- Occupation
- Ethnicity
- Marital status
- Religion
- Educational status
- Economic status
- Sexual history
- Drug history
- Blood transfusion

4.7 Measurement

4.7.1 Data collection instrument and procedure

Questionnaires

Structured questionnaire was used to collect data using interviewer administered technique which is developed after reviewing related studies. The questionnaire has three sections that used to obtain socio-demographic information, history of multiple sexual partners, blood transfusion,

history of hospital admission and contact with family having liver diseases and environmental characteristics.

Questionnaire was prepared in English and translated into Afan Oromo and Amharic languages and translated back into English to check its consistency. The Afan Oromo and Amharic versions used for data collection after pretesting on 10% of the actual sample size before the data collection period. Some clarifications and other corrections on the questionnaire made accordingly after pre-testing.

Unique code was given for each questionnaire and on the laboratory request format which is placed at lab. The participant after interview requested to give blood sample by giving a code which relates the questionnaire and the laboratory request format.

Source of Specimens and Collection

Clinical specimens of capillary blood from patients attending the clinic used for the study, the selected subjects were given information about the procedure.

After obtaining informed consent, about 5 ml of blood sample was collected by vein-puncture from each of the participants under aseptic conditions by trained laboratory personnel working in the center and immediately put in a vacutainer tubes containing a clot activator. The tubes numbered and processed at the time of collection and the assay performed within one hour of sample collection.

Serological test

Serum samples tested for HBsAg by using rapid test kits i.e. a lateral flow immunoassay

Method used for detection of HBsAg in serum or plasma. Samples positive for HBV were re-tested for the second time by the same method. Samples repeatedly reactive for HBsAg were considered positive. All tests procedure carried out according to the manufacturer's instructions as outlined in the package inserts. All subjects who were positive for HBV infection were communicated with the attending physician for possible evaluation and management.

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4.8 Data processing & analysis

Data entered and analyzed using SPSS version 20 computer software. Summary results presented by frequency tables and graphs. Bivariate analysis performed to check the existence of association between dependent and independent variables.

Variables which are significant at a P value of < 25% in binary logistic regression considered for multiple logistic regressions. Variables which are also biologically important and showed significant association in the previous studies included in multiple logistic regression analysis. Finally all groups of selected explanatory variables fitted to a final model and the p- value less than 0.05 was used as cut off point for presence of statistical significance.

4.9 Quality Assurance

Training provided to selected data collectors for three days about the objective and process of data collection. Nurses were used as interviewers and training was given on questionnaire administration to attain standardization and maximize interviewer reliability. Laboratory technicians were trained on how to stick on standard operating procedures. Pre-testing conducted at clinic before actual data collection.

Standard operating procedure (SOP) was used for every laboratory procedures. Closer supervision undertaken during data collection and problems faced discussed over night with data collectors and the supervisors.

4.10 Ethical consideration

Ethical clearance letter was obtained from Institution Health Research Ethics Review Committee (IHRERC) of JUMC. Permission paper sought from Harar town Health Department and Hamdi medical and surgical specialty center. Similarly after clear discussion about the actual study or explaining of purpose of the study, verbal informed consent obtained from each study participants. Participant's right to refuse to participate in the study or withdraw at any time during the course of the interview respected and it clarified that this decision will not affect the care they seek to receive. Identification of study participants by name was not recorded to assure the confidentiality of the information obtained.

Clients with positive result communicated with the attending physician for possible help as per guideline.

4.11 Dissemination plan

The final result of this study will be presented to Jimma University, College of Public Health and Medicine and disseminated to Harar health bureau and Hamdi medical and surgical specialty center.

5. RESULTS

5.1 Socio demographic characteristics

A total of 320 patients attending at Hamdi medical and surgical specialty center outpatient department were enrolled in the study. The mean and standard deviation of participant's age were 35.1 and 12.8 years respectively. One hundred seventy (53.1%) of them were males (table 5.1)were males and 268 (52.5%) of the patients came from rural areas. Out of 320 attendants, 164 (51.3%) of them can't read and write and only 57 (17.8%) attended secondary school and above(Table 5.1).

One hundred seventy four (54.4%) of them belong to Oromo ethnicity and 226 (70.6%) were Muslims. Most of the female patients were house wife and account for 27.5%% of the total. Majority of them were married 221 (69.1%). The mean monthly income of the family was 4384.3 Birr (ranging from 550 – 16500) (Table 5.1).

Table 5.1: Socio-demographic characteristics of study participants, Harar, January 2020(N = 320) ---22

Characteristics	Frequency	Percent
Age		
<30	113	35.5
30-39	135	42.2
40-49	41	12.8
>=50	31	9.7
Sex		
Male	170	53.1
Female	150	46.9
Place of residence		
Urban	152	47.5
Rural	43	52.2
Marital status		
Married	193	75.4
Single	35	13.7
Divorced	14	5.5
Widowed	14	5.5
Ethnicity		
Oromo	122	47.7
Amhara	90	35.2
Gurage	20	7.8
Silte	16	6.3
Others	8	3.1
Education		
Can't read and write	164	51.3
Primary	47	14.7
Junior (7-8)	52	16.3
Secondary and above	57	17.8
Religion		
Muslim	226	70.6
Orthodox	70	21.9
Protestant	24	7.5
Income		
<2000	161	50.3
2000-2999	141	44.1
>3000	18	5.6
Occupation		
Employed	62	19.4
House wife	88	27.5
Daily laborer	82	25.6
Private work/Merchant	55	17.2
Student	33	10.3

5.2 HBV Seroprevalence and clinical characteristics of study participants.

The overall seroprevalence of hepatitis B virus infection was 10.6%(34/320) . Of the 34 positive results 16 were males and 18 were females. Sixty two (19.4%) of the participants gave history of sexually transmitted infection. Regarding behavioral characteristics about 12.8 percent of them gave history of smoking and 123 (38%) had history of khat chewing.

Table 5.2: *Clinical* characteristics of study participants, Jan 2020 (N = 320)

Characteristics	**Frequency**	**Percent**
HBsAg		
Positive	34	10.6
Negative	286	89.4
History of STI		
Yes	62	19.4
No	258	80.6
Multiple sexual partners		
Yes	27	8.4
No	293	91.6
History of blood transfusion		
Yes	31	9.7
No	289	90.3
Tattooing		
Yes	21	6.6
No	299	93.4
Alcohol intake		
Yes	19	5.9
No	301	94.1
Chat chewing		
Yes	123	38.4
No	197	61.6
Smoking		
Yes	41	12.8
No	279	87.2
Ear/Nose piercing		
Yes	132	41.3
No	188	58.8
Dental extraction		
Yes	15	4.7
No	305	95.3
Surgical Procedure		
Yes	39	12.2
No	281	87.8
Circumcision		
Yes	304	95
No	16	5

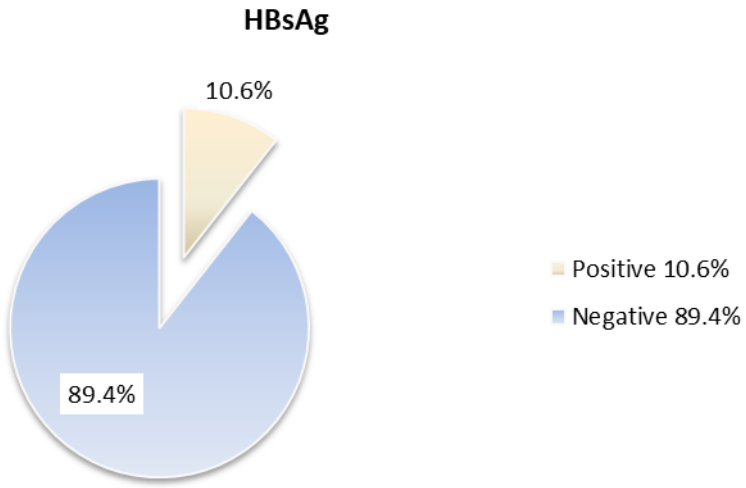

Fig 1. Shows the seoprevalnce of HBV infection at OPD, Harar, 2020

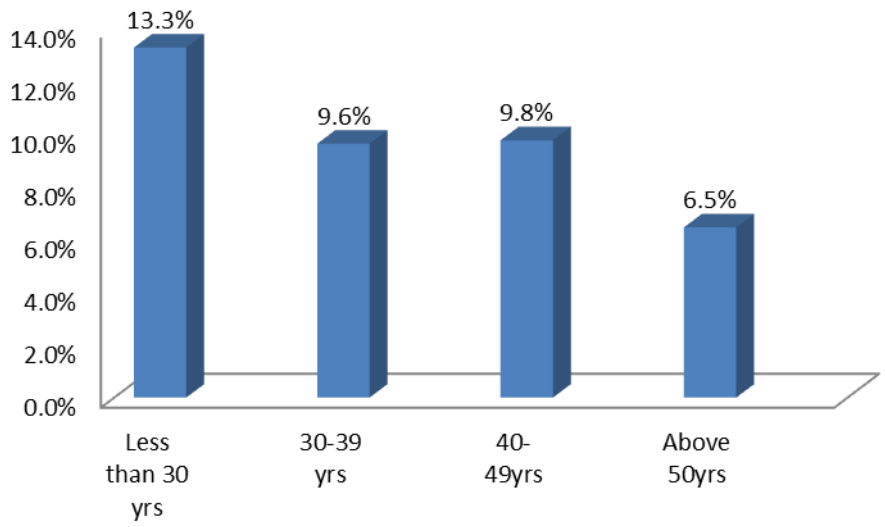

Fig 2: Seroprevalence of HBV infection at Adult OPD, by age category, Harar, 2020.

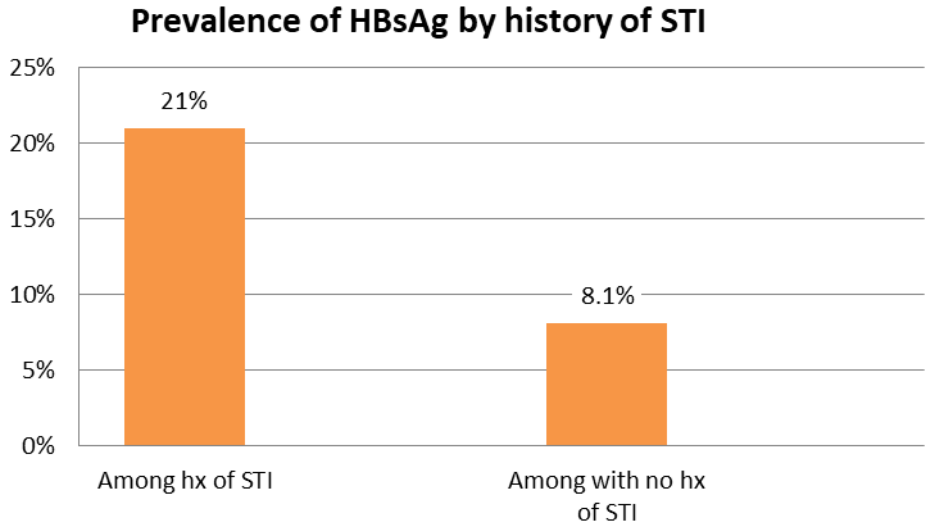

Fig 3: Shows seroprevalence of HBsAg among groups of those with and without history of sexually transmitted infections (STI).

5.3 Factors associated with HBV infection

The hepatitis B virus infection was assessed based on socio-demographic characteristics of the study subjects. Age, residence, occupation, income, religion, marital status and educational status showed no significant difference with the outcome.

There was a statistically significant association between, history of any contact with jaundiced patient, history of sexually transmitted infection and age greater than forty years with seropositivity for HBV infection (Table 5.3).

Those participants who had history of any contact with jaundiced patient are about seven times more seropositive for HBV when compared with those with out any contact history (AOR: 7.4, 95% CI:(2.45, 22.6), p= 0.000). Respondents with previous history of sexually transmitted infection are about three times more seropositive for HBV infection. (AOR: 3.07, 95% CI :(1.28, 7.35), p= 0.011).

5.3 Multivariate analysis of factors associated with Sero-positivity of HBV infection.

Table 5.3: Multivariate analysis of factors associated with sero-positivity of HBV infection among adult OPD attendants in Harar, Jan 2020 (N = 320)

Characteristics	COR (95% CI)	AOR (95% CI)	P-value
Age			
Less than 30yrs	0.96(0.44, 2.1)	1.29(0.54, 3.06)	0.551
30-39yrs	1		
Above >=40yrs	1.74(0.59, 5.1)	3.9(1.07, 14.68)	0.038
Sex			
Female	1		
Male	1.13(0.55, 2.31)	1.5(0.295, 5.26)	0.603
Place of residence			
Rural	1		
Urban	0.751(0.36, 1.54)	0.754(0.32, 1.7)	0.497
Tattooing			
No	1		
Yes	1.44(0.75, 5.1)	4.8(1.05, 7.5)	0.043
Hx of Contact with jaundiced pt			
No	1		
Yes	6.4(2.31, 18.09)	5.9(2.45, 19.6)	0.007
Ear/nose piercing			
No	1		
Yes	1.14(0.55, 2.33)	2.12(0.41, 10.9)	0.361
Hx of surgical procedure			
No	1		
Yes	0.95(0.31, 2.87)	0.80(0.23, 2.70)	0.723
Hx of STI			
No	1		
Yes	2.57(1.19, 5.54)	3.07(1.28, 7.35)	0.011
Circumcision			
No	1		
Yes	0.49(0.13, 1.82)	0.38(0.09, 1.6)	0.187
Khat chewing			
No	1		
Yes	1.93(0.94, 3.96)	2.06(0.81, 5.2)	0.130

AOR: adjusted odds ratio, COR: Crude odds ratio, 95% CI: 95% confidence interval

6. DISCUSSION

This study was aimed at determining the seroprevalence of hepatitis B virus (HBV) infection at adult outpatient attendants in Harar. The overall prevalence of HBV infection was 10.6%. This finding is consistent with a study from Northern Ethiopia, Sekota where HBV seropositivy was 10% among the hospital attendants in 2014(30). This finding is also in agreement with study on seropositivity for HBV infection in Poland,9.7%(15).Similary it is comparative to studies done in Pakistan,10%(18) and China,8.9%(17)except difference in target population. In contrast it is higher than a study from Goba hospital 7.4%(24) which could be from difference in behavioral characteristics of participants and the geographic distribution.

This finding is also higher than figures from developed countries like Britain, USA, and Greece (0.1%, 0.2% and 3%) (39),where this can be explained by the difference from socio cultural and preventive health care practice including HBV vaccination coverage of the countries and the difference in the study population, the general population.

This study found that Age, residence, occupation, income, religion, marital status and educational status showed no significant association with seopositivity for HBV infection. This study did not show significant difference among males and female with regard to association with seropositivity for HBV infection and in agreement with study from Gambella(42) and Hawassa(43). It is also in agreement with studies conducted in Britain and USA(39) as well China(17).Similarly a study in Philippine showed no significant difference between males and females (16) .

Male gender was thought to be more affected in other studies; in Sekota,the seroprevalence in males was higher than in females, 22.8 % and 19.1 % respectively (30). As well the study done in Goba hospital at outpatient attendants showed higher seropositivity for HBV infection among males (26). This could be dependent on the cultural and behavioral differences in these

communities that that exposes to the infection, as males might be more likely to have risky behaviors in some communities.

There was a statistically significant association between, history of any contact with jaundiced patient, tattooing and sexually transmitted infection with seropositivity for HBV infection. This could be explained by HBV infection can be transmitted via sexual or household contact , sharing tattooing needle and at high risk of transmission if there is other sexually transmitted infection. It is consistent with a finding from Morocco (19) and Kenya (34). Similarly multiple sexual partners and sexual or household contact with an infected person was found to be associated with HBV infection in Pakistan (18).

Tattooing was associated with prevalence of HBV infection in studies conducted in northern Ethiopia and Nigeria (40, 41). Risk factors like tattooing, piercing, genital mutilation and human bites were not associated with seropositivity of HBsAg in a study conducted at Gambella, Addis Ababa and Hawassa (42, 43), this variation may be due to cultural practice differences and different materials used during tattooing.

7: CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

The overall seroprevalence of hepatitis B virus infection detected was 10.6% which is relatively higher. History of contact with jaundiced patient, tattooing and history of sexually transmitted infection were associated with seropositivity for HBV infection.

7.2 Recommendations

For Hamid Speciality Clinic:

- Health education should be provided on routes of transmission, risk factors and preventive methods of HBV infection.
- The clinic should work with concerned bodies to avail further testing for seropositive patients and treatment.

For Harar Regional Health Bureau:

Large scale study in the area is needed to draw directive for the catchment population.

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ANNEXES

ANNEX I: English Version of the Questionnaire

Jimma University College of

Medical and public health sciences

Questionnaire for Data Collection on Seroprevalence and associated factors of Hepatitis B virus infections among adult clients at Hamdi medical and surgical center, Harar town, Eastern Ethiopia.

Consent form

CODE_____

Verbal consent form before conducting interview

Greeting: Hello, my name is _____. I am final year internal medicine resident at Jimma university. The objective of this study is to determine the Seroprevalence and associated factors of Hepatitis B virus infections among adult clients. The outcomes of the findings can help in the evidence- based decision to develop intervention strategies to improve the health status of the most vulnerable group. I would like to ask you a few questions. Also you requested to provide blood sample for investigation.
Your cooperation and willingness for the interview is helpful in identifying problems related to

I. Socio-economic and demographic characteristics

the subject matter. Your name will not be written in this form. All information that you give kept strictly confidential. Your participation is voluntary and you are not obliged to answer any question you do not wish to answer. If you are not still comfortable with the interview please feel free to drop it any time you want. Do I have your permission to continue?
1. If yes, continue to the next page.

2. If no, skip to the next participant.

Interviewer name and code _____ signature _____

Supervisors name _____ signature _____

General instruction

Almost all of the questions do have a pre coded response. So it is important to follow the following instructions while you are interviewing the respondents and recording their responses

- Ask each questions exactly as written on the questionnaire
- Circle the responses that best match with the answer of the respondent
- Do not read the pre coded responses for the respondents, listen only the response of the respondents.

Sr.no	Question	Response	code
101	Age	_____	/_____/
102	Sex	1.Male_____ 2.Female_____	/_____/
103	What is your ethnicity	Oromo … 1 Harari…. 2 Amhara… 3 Silte… 4 Guraghe…. 5 Other…. 6	/_____ _/
104	What is your marital status?	Single 1 Married 2 Divorced 3 Widowed 4	/_____ _/
105	What is your educational level?	Illiterate (cannot read and write) 1 Primary (grade 1-6)……. 2 Junior(7&8)…….……... 3 Secondary (9-12) and above…. 4	/_____ _/
106	What is your religion?	Protestant . . . . ……. 1 Muslim . . . . 2 Orthodox……..... 3 Catholic . . . . . … 4 Others 5	/_____ _/
107	Where is your usual place of residence?	Urban…….1 Rural……..2	/_____/
108	What is your main occupation?	Employed(GO/NGO) ……..1 House wife……2 Student……..…3 Self employee/merchant……..4 Daily worker ……...5 Others_____ (specify)	/_____/

109	What is your family size?	In Number	/_____/
110	What is your monthly income in birr? **Enter response in birr**	_____	/_____/
II.	**Proximate risk factors for Hepatitis B virus infection**		
201	201. History any contact(Sexual or household) with jaundiced patients	1)yes 2)no	/_____/
202	202. History of sexually transmitted diseases	1)yes 2)no	/_____/
203	203. Multiple sexual partner	1)yes 2)no	
204	204. Blood transfusion	1)yes 2)no	/_____/
205	205. *Tattooing on body or gum*	1)yes 2)no	/_____/
206	206. Frequent intake of alcohol use	1)yes 2)no	/_____/
207	207. Khat chewing habit	1)yes 2)no	/_____/
208	208. Smoking history	1)yes 2)no	/_____/
209	209. *Ears or nose piercing*	1)yes 2)no	/_____/
210	210. *Dental extraction*	1)yes 2)no	/_____/
211	211. Surgical procedures	1)yes 2)no	/_____/
212	212. *Circumcision*	1)yes 2)no	/_____/

ANNEX II: LABORATORY REQUESTING AND RECORDING FORMAT

1. Personal data

1.1 Code _____

1.2 Age _____

1.3 Address _____

1.4 Date of sample collection_____

2. Laboratory data

2.1 HBsAg test result **1. Positive**

2. Negative

Name of investigator _____

Signature _____ Date _____