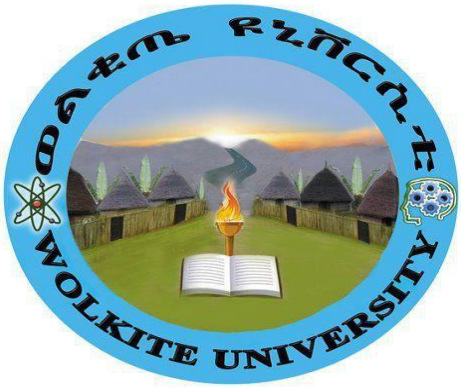


WOLKITE UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCE

DEPARTMENT OF MEDICAL LABORATORY SCIENCE

SEROPREVALENCE OF SYPHLIS, HEPATITIS B AND C VIRUSES INFECTION AMONG PREGNANT WOMEN ATTENDING ANC AT WUSH, GURAGE ZONE, SNNPR, ETHIOPIA

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LIST OF ABBREVIATIONS AND ACRYNOM

WUSH: wolkite university specialized hospital

HBV: Hepatitis B virus

HBeAg: Hepatitis e antigen

ALT: Alanine transferees

HBSAg: Hepatitis B surface antigen

RNA : Ribonucleic acid

IV : Intravenous

ANC : Antenatal care

STIs : Sexually transmitted infections

(HBIG $_{(IgG)}$): Hepatitis B Immunoglobulin

NICU : Neonatal intensive care unit

ELISA:enzyme linked immunosorbent assay

ABSTRACT

BACKGROUND: Syphilis is a chronic infectious disease caused by the spirochete Treponema palladium, subspecies palladium. The genus Treponema belongs to the order *Spirochetes*, consisting of spiral-shaped pathogenic bacteria. Syphilis has significant long-term morbidity especially for pregnant women and can cause serious complications in pregnancy, which may result in the following: spontaneous abortion, stillbirth, non-immune hydrops, intrauterine growth restriction, malformations and perinatal death. Hepatitis B virus (HBV) is a double-stranded hepatotrophic DNA virus. Which Is global health problem. It transmitted by percutaneous or mucosal exposure to infected blood or body fluids (saliva, menstrual, vaginal, and seminal fluids), Mother to child (perinatal) transmission And Sexual transmission The hepatitis C virus (HCV) is a small, RNA-enveloped virus with a highly variable genome. Risk factors for acquiring HCV: blood transfusion, IV drug use, cut or injury by bloody object, ear piercing or tattooing.

OBJECTIVE: The objective of the study was to perform study on prevalence of Syphilis, HBV and HCV infection among pregnant women attending ANC follow up at Wolkite University Specialized Hospital at Garage Zone, SNNPR, Ethiopia

Methods: The cross-sectional study was conducted to assess the sero-prevalence of syphilis, hepatitis B virus, HCV among preganant women in Wolkite university specialized hospital, Gubre Ethiopia from March to june, 2022. Socio-demographic data were collected by pre-structured questionnaire. Sample testing for Syphilis, HBsAg and HCV were collected using; Bioline strip test. It is a qualitative, solid phase, two-site sandwich immunoassay for the detection of Syphilis, HBsAg and HCV in serum or plasma.

RESULT: The magnitude of sero prevalence of SYPHILIS, HBV and HCV among pregnant women attending at WUSH was 0%, 1.6% and 0% respectively.

CONCLUSION: The prevalence rate was low to HBV and there were no prevalence to SYPHLIS and HCV. even though the prevalence was low and no, it need further diagnosis inorder to become more sure and confident.

KEY WORD: seroprevalence, syphilis, Hepatitis B virus (HBV), hepatitis C virus (HCV), Pregnancy

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CHAPTER ONE: INTRODUCTION

1. BACKGROUND

1.1 SYPHILIS

Sexually transmitted infections (STIs) are a serious public health problem in developing countries, including Ethiopia (1). Syphilis is STIs caused by the spirochete Treponema palladium and constitutes a major public health problem worldwide (2).

Syphilis is an important cause of morbidity and mortality in pregnancy and it is one of the greatest public health challenges (3). Pregnant women are sexually active and at risk of sexually transmitted disease, including syphilis. The route of transmission of syphilis is almost always by sexual contact, although there may be congenital syphilis via transmission from mother to child in utero. If not treated, syphilis can cause serious effects such damage to the aorta, brain, eyes, and bones.

WHO estimates that approximately 349 million people are actively infected with a treatable sexually transmitted disease estimates from 1999 suggest an annual rate for syphilis of approximately 12 million active infections. Almost two-thirds of these cases are in sub-Saharan Africa and south/southeast Asia. Recent outbreaks have been reported from many countries on all continents. (4-7)

1. 2 HEPATITIS B VIRUS

Hepatitis B virus (HBV) is an envelope virus with a viral genome of partially double stranded circular DNA which belongs to the family Hepadenoviridae [1, 2]. HBV has a strict tissue tropism to the liver and causes acute and chronic infections of the liver. It is a major cause of chronic hepatitis, cirrhosis, and hepatocellular carcinoma. Due to its largely asymptomatic nature, viral hepatitis is a silent epidemic like to kidney disease; most people are unaware of their infection [3]. Infections by HBV in pregnancy come with its attendant effect on child [4].

There are three possible routes of transmission of HBV from infected mothers to infants: Tran's placental transmission of HBV in utero, natal transmission during delivery or postnatal transmission during care of infant or through breast milk. In patients with acute hepatitis B

infection vertical transmission occurs in up to 10% of neonates when infection occurs in the first trimester and in 80 -90% of neonates when acute infection occurs in the third trimester [9]. Chronic HBV infection during pregnancy is usually mild but may flare after delivery or with discontinuing therapy [10]. The sero-markers and bio-markers associated with HBV infection include HBsAg, anti-HBs, HBeAg, anti-HBc, IgM-anti- HBc and IgG-anti- HBc.

1.3 HEPATITIS C VIRUS

This is a single-stranded RNA virus of the family Flaviviridae (15). There are at least six major genotypes—type 1 accounts for 70 percent of HCV infections in the United States. Transmission occurs via blood and body fluids, although sexual transmission is inefficient. Up to a third of anti-HCV positive persons have no identifiable risk factors. Screening for HCV is recommended for HIV-infected individuals, persons with injection drug use, hemodialysis patients, children born to mothers with HCV, persons exposed to HCV-positive blood or body fluids, persons with unexplained elevations in aminotransferase values, and recipients of blood or transplants before July 1992.

1.2 THE STATETMENT OF THE PROBLEM

Syphilis, HBV and HCV are the major pregnancy complicating medical infection especially in developing countries like Ethiopia. The risk of syphilis, Hepatitis B and Hepatitis C virus Infection during pregnancy mostly increased.

In sub-Saharan Africa estimated that in pregnancy active syphilis infection can cause adverse outcomes in 50-80% of pregnancies. A surviving post 12 weeks conception and syphilis sero-reactivity ranges from 4-15% (8). Recent data from Malawi and Tanzania indicated that 21% of perinatal deaths, 26%-51% of stillbirths, 24% of preterm live births, 17% of all adverse

pregnancy outcomes and 11% of neonatal deaths have been attributed to untreated sero-positive pregnant mothers (9). Furthermore, in Ethiopia studies have demonstrated that 21% children born from sero-positive mothers had developed signs of syphilis. Stillbirth and abortion rates of infected women were almost double than among the general population (10).

Hepatitis B had been reported that 10-20% of HBsAg positive pregnant women transmit the virus to their babies and women, who are positive for both HBsAg and HBeAg, have a chance of transmitting HBV to their newborns at birth (delivery) nearly 100%. Up to 90% of the newborns born to these mothers go on to develop chronic hepatitis B if they do not receive hepatitis B immune globulin (if mother is positive) and hepatitis B vaccine (if the mother is negative) at birth [5]. Although this means of transmission has not been reported to be teratogenicity, a higher incidence of low birth weight, low intelligence quotient (due to unconjugated bilirubin), and liver cirrhosis and hepatocellular carcinoma in young, adulthood may result [2].

Prenatal HCV infection screening has been recommended in high risk women, and in the United States, sero prevalence rates as high as 1 to 2.4 percent have been reported. It is higher in women who are HIV positive, and Santiago-Munoz and associates (2005) found that 6.3 percent of HIV-infected pregnant women at Parkland Hospital were co-infected with hepatitis B or C. Acute HCV infection is usually asymptomatic or with mild symptoms. Only 10 to 15 percent develop jaundice. The incubation period ranges from 15 to 160 days with a mean of 7 weeks. Aminotransferase levels are elevated episodically during the acute infection. Hepatitis C RNA testing is now considered the “gold standard” for the diagnosis of HCV levels may be detected even before aminotransferase elevations and the development of anti-HCV. Anti-HCV antibody is not detected for an average of 15 weeks and in some cases as long as a year. As many as 80 to 90 percent of patients with acute HCV will be chronically infected. Although most remain asymptomatic, approximately 20 to 30 percent progress to cirrhosis within 20 to 30 years. Aminotransferase values fluctuate, and HCV RNA levels vary over time. Liver biopsy reveals chronic disease and fibrosis in up to 50 percent; however, these findings are often mild. Overall, the long-term prognosis for most patients is excellent. As expected, most pregnant women diagnosed with HCV have chronic disease. HCV infection was initially thought to have limited pregnancy effects. However, more recent reports have chronicled modestly increased fetal risks for low birth weight, NICU admission, preterm delivery, and mechanical ventilation. In some

women, these adverse outcomes may have been influenced by concurrent high-risk behaviors associated with HCV infection. The primary adverse perinatal outcome is vertical transmission of HCV infection to the fetus-infant. This is higher in mothers with viremia cited a rate of 1 to 3 percent in HCV-positive, RNA-negative women compared with 4 to 6 percent in those who were RNA-positive. In a report from Dublin, McMenamin and colleagues (2008) described transmission rates in 545 HCV-positive women (14). They found a 7.1-percent vertical transmission rate in RNA-positive women compared with none in those who were RNA-negative. Some have found an even greater risk when the mother is co-infected with HIV.

Therefore, investigating the problems caused by Syphils, Hepatitis B and Hepatiti C is the most important thing in this study; so assessing the prevalence of Syphilis, HBV and HCV infection in pregnant women becomes main problem of this study, because pregnant women can represent the majorities of the population in the communities and also pregnant women's are the interface for their sexual partners and infants. At the same time, individuals who have chronic infection serve as the major reservoir for continued Syphilis, HBV and HCV transmission.

1.3 THE SIGNIFICANCE OF STUDY

Screening and treating mothers for Syphilis, HBV and HCV during pregnancy can prevent adverse pregnancy outcomes associated with maternal infection. However, the burden of this disease in pregnancy persists and the burden may vary depending on the variation in the timing and frequency of ANC visit, diagnosis and treatment, socio-demographic variables, cultural practice and socio-economic factors. Such data is scarce in Ethiopia, particularly in the study area. Therefore, this study will be aimed to provide information for health policy makers to plan effective strategies to control Syphilis, HBV and HCV transmission during pregnancy.

CHAPTER TWO: LITRETURE REVIEW

2.1 SYPHILIS

Globally, about 1 million pregnancies are affected each year by syphilis due to maternal infection, and because of these about half of the pregnancies result in stillbirth or neonatal death (19). In many developing countries syphilis remains a major cause of adverse pregnancy outcome. There are several pregnancy outcomes associated to maternal syphilis, which are spontaneous abortion, stillbirth, low birth weight (LBW), premature delivery and congenital syphilis (20). Antenatal syphilis screening is inexpensive and effective towards the reduction of syphilis impact on pregnancy, and yet syphilis continues to be a threat to pregnant women in low resource settings (21), Prevalence of antenatal syphilis in Africa ranges from 3% to 17% (22).

The 1993 World Development Report (WDR) cites antenatal syphilis screening as one of the most cost effective ways to improve children's health. Despite this, only an estimated 38% of women attending for antenatal care in Africa receive syphilis screening.

The study was conducted the prevalence of syphilis among pregnant women in Brazil, with a prevalence rate of 1.7% (30). Congenital syphilis has experienced resurgence in the country, with an incidence of 1.8 cases per 1000 live births and a mortality rate of 2.4 deaths per 100,000 individuals in 2007(23).

The prevalence and correlates of syphilis among pregnant women in rural areas of South China, Altogether 27,150 pregnant women in rural Guangdong were screened for syphilis. 106 (0.39%) syphilis cases were diagnosed, of which 78 (73.6%) received treatment for syphilis. Multivariate analysis revealed that older pregnant women (31-35 years old, a OR 2.7, 95% CI 0.99-7.32; older than 35 years old, a OR 5.9, 95% CI 2.13-16.34) and those with a history of adverse pregnant outcomes (a OR 3.64, 95% CI 2.30-5.76) were more likely to be infected with syphilis (24).

Congenital syphilis, in particular, is estimated to inflict over 1.5 million pregnant women in Sub-Saharan Africa with approximately 60% of the acute cases leading to foetal death. This amounts to nearly 500,000 infant deaths from syphilis in sub Saharan Africa alone, rivalling those due to HIV (3). Antenatal syphilis screening is a written national policy in nearly all African Ministries of Health; however, screening is performed sporadically at best. A 1997 survey completed by 22

sub-Saharan Africa countries produced estimates that fewer than 38% of women already attending antenatal care were likely to have been screened. Failure to screen for syphilis in pregnancy was estimated to have resulted in at least 1 million missed opportunities annually to have identified and treated pregnant women with active syphilis (25).

In sub-Saharan Africa estimated that in pregnancy active syphilis infection can cause adverse outcomes in 50–80% of pregnancies surviving post 12 weeks conception and syphilis sero-reactivity ranges from 4–15% (26).

In Nigeria two independent studies were conducted in 2009 which showed that the sero-positivity of Syphilis in pregnant women was 0.4% (01 out of 231 pregnant women) and 1.5% (157 out of 10680) in year when screened for Syphilis infection by RPR method (25).

To measure the impact of maternal syphilis on pregnancy outcome in the Mwanza Region of Tanzania, 380 previously unscreened pregnant women were recruited into a retrospective cohort at delivery and tested for syphilis. Stillbirth was observed in 18 (25%) of 73 women with high-titer active syphilis (i.e., women with a rapid plasma reagin titer $\geqslant$1:8 and a positive *Treponemapallidum* hema agglutination assay or indirect fluorescent treponemal antibody test result), compared with 3 (1%) of 233 uninfected women (risk ratio [RR], 18.1; P<.001). Women with high-titer active syphilis were also at the greatest risk of having low-birth-weight or preterm live births (RR, 3.0 and 6.1, respectively), compared with women with other serological stages of syphilis. Among unscreened women, 51% of stillbirths, 24% of preterm live births, and 17% of all adverse pregnancy outcomes were attributable to maternal syphilis.

Studies from Saudi Arabia in year 2000and 2007 have reported a rate of 0.7% and0.02% of syphilis among prenatal women respectively (26).

Study in Bobo-Dioulasso, Burkina Faso, Were recruited between January 1995 and July 1998 in three antenatal clinics Overall, 10,980 pregnant women were screened. Syphilis seroprevalence was 0.24% (27).

Analysis of data from routine HIV and syphilis testing at Uganda Entebbe Hospital antenatal services, a total of 20,738 women attended antenatal services. Syphilis prevalence was 4.0% (28).

Syphilis seropositivity among the 17,669 women attending the antenatal care clinics in the Democratic Republic of Congo during 2011 was 4.2% (range 0.4%-16.9%). Syphilis seropositivity was significantly higher among women attending rural clinics (5.0%) as compared to urban clinics (3.0%) and those tested in antenatal care clinics in the provinces of Equateur (7.6%) and Orientale (7.7%) (29).

In Ethiopia, according to ANC-based sentinel surveillances, syphilis prevalence increased from 1%, in 2012 to 1.2%, in2014 and as high as 2.9 to 3.7% in recent studies among ANC attendees in Gondar and 7.3 to 9.8% among HIV patients in Hawassa and Addis Ababa (30),respectively.

The research conducted in three teaching hospitals of Addis Ababa University Faculty of Medicine, Department of Obstetrics and Gynecology, among a total of 410 pregnant women attending antenatal care from April 1997 to September 1997, twelve women (2.9%) were positive for Venereal Disease Research Laboratory (VDRL). The study showed that the seropositive women were more likely to be those with lesser income (<600 birr/month). Past history of abortion was significantly associated with VDRL seropositivity ($p<0.05$). Similarities and differences between the findings of this study and other national and international reports have been noted (30).

Pregnant women attending Gondar university hospital, syphilis seroprevalence and associated risk factors of the total pregnant women, 69(2.9%) were confirmed as seropositive for syphilis. Relatively high seroprevalence of syphilis were observed among age groups of 21-25 years of old (3.4%) followed by in the age group of 26-30 years of old (3.1%).

A study was conducted in Gondar Health Center antenatal clinic attending pregnant women from August 01 to December 30, 2006. Among the 480 ANC attendees, the sero-prevalences of syphilis were 2.3%, (31)

A retrospective study was carried out on 2385 pregnant women attending at Antenatal Care Clinic (ANC) of Gondar university hospital from January 2009 and December 2011. The age of the women ranged from 16–45 years with a mean of 30.5 years. The majority of women were in the 21–25 years age group (34.9%). One thousand and seven hundred forty five (73.2%) pregnant women were living in urban and most of the women were housewives (77.7%). In

terms of years of study period, the highest numbers of ANC attendees were 1021(42.8%) obtained in the year 2009.

A cross sectional study was conducted among pregnant women attending in south Ethiopia Yirgalem hospital ANC clinic from October 2015 to August 2016. Out of 494 pregnant women, the prevalence of confirmed syphilis seropositive was 5.1% (25/494; 95 CI, 3.2-7.1%). The Sero-prevalence of syphilis increased with gestational period, peak in third trimester (6.1%) and also in women who were occupationally health worker (10.5%), followed by housewives (6.1%) and rural resident (6.3%).(32)

2.2 HEPATITIS B AND C

Hepatitis B and C occur worldwide and constitutes a serious public health problem. It is predominantly problem in resource-limited countries and its prevalence varies markedly in different geographic areas of the world, as well as in different population subgroups [33].

The major risk factors associated with hepatitis B and C infection are injection of drug abuse ,heterosexual activity homosexual activity) In addition health care workers laboratory workers ,oral surgeons and dentists are high risk group for hepatitis Band C virus infection word wide there believed to be 360 million peoples infected with hepatitis Band about Two billions people have been infected by HBV worldwide (16) Every year three to four million people of the world are infected by hepatitis C and about 150million people are Chronically infected (17)

In Africa about one fifth of the population are Carriers of HBV and HCV prevalence of HCV is estimated about 8% in west Africa while prevalence of HCV,about 10% in some parts of Africa (18).Indeed About 20-25% of African population are chronically infected by Hepatitis Band c viruses and liver cancer prevalent among affected individuals (5) with men in the 30-45 age group severely affected with almost 100%mortality rate (5). In1993. A total of 13, 361 case of hepatitis B were reported to CDC (34) Each year an estimated of 300,000 peoples in use are infected with HBV 915) An epidemiologic study done from 1981 to 1988 in USA showed that the proportion of hepatitis B cases accounted for homosexual activity decreased by 62% as proportion of case acquired by hetero sexual activity increased by 38% (35). In 2005 ,there were an estimated 19,000 new cased of hepatitis A ,15,000 new case of HBV and 20,000 new cases of HVV infection were reported (35). In addition of least 2.25 million peoples have chromic HBV

infection and 3.2 -4 million peoples estimated to have chronic HCV infection which can cause liver cirrhosis liver cancer, liver failure and death (35).

In south American the prevalence of HBsAg increases from south to north, from 0.5 % to 1.1 % chill Argentina, Uruguay and Southern Brazil (1.5% to 3%) moderate rates (36) . A remarkably high prevalence has been Noticed in Central Amazon region (5%-15%) as well as some areas in Colombia. Peru. Venezuela (36). The world prevalence of HCV infection based on immune assay for Ab to HCV approximates 1% -2% in US.1.8% of the population was positive for Anti HCV Ab (37) . Sero prevalence of HCV Ab using second generation assay was around 0.3% in Australia 1.5 % to 3% in the Philippines Indonesia, Thailand as Vietnam 1% in Taiwan and china and as high as 3% -4% in Japan(38). Transmission of HCV to health Worker by needle Stick was well documented and there was 2% to 4% seroconversion rate reported(39) . india showed that HBV infection was nearly 3.5% and chronic Hepatitis B is repented in more than ----of the chronic hepatitis case (40).

According to study done in Pakistan prevalence of HBV among study participants was 3. 17% and prevalence of HCV was reported to be 13 .0% the proportion of hepatitis B reactive case was fairly similarly across different age group .However the frequency of hepatitis C reactive cases significantly higher among individuals of age between 41to 51 years compared to individuals of age 21-30 years After adjusting for age prevalence among prisoners and injection drug users was higher than health care works prevalence. Prevalence of hepatitis B and C differed significantly between group prevalence of HBV and HCV lowest among health workers (HBV -1.0% and HCV 2.9% while prevalence of hepatitis Band C is highest among Injection drug users (IDUs) (HBV- 5,7% and HCV -68.3% prevalence of hepatitis Band C is higher among security personnel compared with prisoners while no difference of HCV prevalence between these group injection drug users were 46 time more likely to be hepatitis C positive compared to Health Care Workers (41).

Study done in morocco reported that sera prevalence of anti HCV Ab was found to be 1.58% of these individual viral DNA was defected in 70,9% prevalence of HCV through the age group was 0% ,o,77% 0.92% ,17%^ and 3.12% for <20,[20-29],{30-39}.[40-49].and >50 age respectively ,for those individual prevalence of HCV in female 1.48 which was lower than that of male 1,62% the overall than that of male 1.62% the overall prevalence of HBsAg was 1.81%

and the prevalence was as follows across the age group 0% ,1.41% ,2.12% ,1.95%, and 1.71% ,for <20,[20-29][30-39],40-49] and >50 age respectively . HBsAg prevalence across gender was 2.29% for male and 0.93% in female subjects males with age group [30-39]and [40-49] year represent the highest sera prevalence of HBs Ag found in this study 2.47% and 2.45% respect out of 23.578(42).

According to study done on patients admitted with Chronic liver disease in public hospital in AA ,prevalence of HBs Ag was 35.8% the prevalence is higher in males 38.2% than in female 31.8% the prevalence of HBV was highest 61% in age group of 28-37 year but non in >68 year age group .more urban dwellers 28.3% were HBsAg positive than rule dwellers which was 7,5%.married patients have higher prevalence than singles which 19.2% for married 12.5 for singles and 1.7% for widowed participants. Among patients with CLD 22.5% were positive for anti HCV Ab ,the prevalence was higher in females 29.5% in male 18,4% the magnitude of HCV by age group was higher the age group of 48-57 was lowest in about 68 years old prevalence of anti HCV Ab progressively increased from 1.7% foe age group 18-28years to 9.2% in age group 48-57 years than decline to Zero for age group>68 years old sero positivity of HCV was high among widows 50% than divorced (37.5%). Dual infection was detected in three patient out of 120 (2.5%).Of 120 subjects with CLD 58-3% had history of admission to hospitals ,of these 28.6% and 22.9% of 120 subjects with CLD 58% had history of admission to hospital of these 28.6% and 22.9% were positive for HBsAg and Anti HCV Ab respectively of these who admitted to hospital only 35.7% had history of blood trans fusion and 30 % of them had history of Either minor or major surge of these who have history of surgery 19.0% and 23.8% were positive for HBsAg and anti HCV Ab respectively 42.5% of the study participants had history of dental extraction at health facilities and 34.2% were at home, and 6.7% of them in both at home and health facility of those dental extraction at health facility 35.2% were positive for HBsAg and 33.3 were positive for Anti HCV Ab .those who had Tooth extraction at health facilities were 2.95 times more likely to have infection with HCV than the counter parts .participants who had contact with jaundiced patient were 20.8% from those 44% were positive for HBsAg and 24% were positive for anti HCV AB (43)

Study done in Hiroshima Japan reveals that prevalence of HBV infection was 2.78 per 100,000 persons per year and I n china 10% of the total population week suffering from HBV infection

(25). Estimation shows that HBV infection patients in Pakistan could be 7 million and HBV seroprevalance was 4.3% and HCV sero prevalence was 6.5% of total studied population(26).Another study in Pakistan showed the overall prevalence of HVB infection within Study period was 4.6% and for HCV was 13.3% and dual infection was observed 3.9% of in the participants (33).

A studies from Ethiopia, overall sero-prevalence of HBV in pregnant women attending Debre-Tabor Hospital, south Gondar was 5.3% [44], in rural southern Ethiopia 6.1% [45], in Bahir Dar 3.8% [43], in Addis Ababa 3% [44], in Jimma 3.7% [45], in dessie 4.9% [46], and in Mekelle 8.1% [46]. This shows an intermediate endemicity of HBV Infection in Ethiopia according to WHO criteria [47]

In Jimma investigation, when age specific prevalence was considered, age group 16-22 had a higher prevalence (75.9%), and there was a tendency of declining in the prevalence in the remaining age groups, even though there was no statistical significance difference across various age groups [49]. The study was in contrast to HBV infection prevalence, which normally shows a linear rise with age, reported by other investigator in pregnant women and in other studies, such discrepancy could be due to the difference in study design, population and geographic area [48]. The socio-demographic status of the study population shows that a high proportion of HBsAg positivity was among the illiterate [49].

CHAPTER THREE: OBJECTIVES

3.1 General Objective

- To assess the sero-prevalence of Syphilis, Hepatitis B and C among pregnant women attending ANC At WUSH, Gurage Zone, SNNPR, Ethiopia

3.2 Specific Objectives

- To determine prevalence of syphilis among pregnant women attending ANC at WUSH, GURAGE ZONE, SNNPR, ETHIOPIA
- To investigate the prevalence of Hepatitis B among pregnant women attending ANC at WUSH, GURAGE ZONE, SNNPR, ETHIOPIA
- To examine the prevalence of Hepatitis C among pregnant women attending ANC at WUSH, GURAGE ZONE, SNNPR, ETHIOPIA

CHAPTERFOUR: MATERIALS AND METHODS

4.1 Study design

The study design was cross-sectional survey to assess the sero-prevalence of syphilis, Hepatitis B and Hepatitis C among pregnant women attending ANC at WUSH, GURAGE ZONE, SNNPR, ETHIOPIA 2022 G.C

4.2 Study area

The study was conducted in WUSH, GURAGE ZONE, SNNPRS.WUTH located on 10km far from wolkite town, which is the capital city of gurage zone, at gubrye sub-city which far 178km from Addis Abeba and 260km from Hawassa town. The hospital was established in July, 2012E.C in front of main campus and it starts to give different services like Delivery, adult and <5 OPD, Emergency, EPI, ANC, Laboratory and pharmacy services for the community.

4.3 Study period

The study was conducted between March, 13/ 2022 G.C to June, 8/ 2022 G.C

4.4.1 Source Population

All pregnant women who visit ANC department

4.4.2 Study population

Among all pregnant women who were visited ANC department, randomly selected 127 pregnant women since , March, 13/ 2022 to June , 8/2022 G.C.

4.4.3 Study Unit

A pregnant women who were visited ANC department.

4.5 Inclusion and Exclusion Criteria

4.5.1 Inclusion Criteria

All ANC department visited pregnant women, whose data is recorded with full information including syphilis, Hepatitis B and Hepatitis C screened test result.

4.5.2 Exclusion Criteria

All ANC department visited pregnant women with incomplete data and does not screened for syphilis, Hepatitis B and Hepatitis C

4.6 Sampling technique and sample size determination

4.6.1 Sample size determination

The sample size was calculated based on single sample size estimation. The prevalence rate (p= 8.1%) taken from a previous study conducted Mekelle, Northern Ethiopia, taking the highest prevalence and non-duplicative consecutive convenient sampling technique was used. From this, a sample size was calculated as;

$$n = \frac{z2\ p\ (1-P)}{d2}$$

$$n = \frac{(1.96)2\ (0.081)\ (1-0.081)}{(0.05)2}$$

$$n = 114.386 \sim 115$$

By assuming 10% non –response rate, the final sample size is calculated as:

$$NF = nx10/100 + 115$$

$$NF = 115 \times 10 /100 + 115$$

$$NF = 127$$

Whereas n = required sample size

$Z\alpha/2$ = critical value for normal distribution at 95% confidence interval (= 1.96)

P = prevalence proportion HBV on pregnant women

D2 =marginal error= 5% and

NF = final sample size

4.7 Variables

4.7.1 **Dependent Variables**

Sero-prevalence of syphilis, Hepatitis B and Hepatitis C among pregnant women

4.7.2 **Independent Variables**

- History of abortion
- Vaccination status

- Maternal age
- Address
- Occupational status
- Educational status
- Surgical procedure
- Place of previous birth
- Stage of pregnancy
- Body tattooing
- Genital mutilation
- History of blood transfusion
- History of multiple sexual practices
- HIV status etc.

4.8 Data Collection and Analysis

Data on demographic parameters, age, residence, marital status, educational and occupation, was collected from selected individuals. Sero-positivity of syphilis Hepatitis B and Hepatitis C obtained from Bioline strip test**.** Data was collected by using data collection tally sheet prepared by our advisor and the extracted data for the study was analyze anonymously.

4.8.1. Specimen Collection and Processing

2-3ml of venous blood was drawn under aseptic conditions in disposable syringe by experienced laboratory personnel. Test tubes was labeled and prepared at the time of collection. The blood samples taken from the participants was centrifuged at 3000 revolution per minute (RPM) for at least 5 minutes at room temperature. The rapid Bioline strip test was performed to deliver the result of the pregnant women at the time of screening. The leftover serum was separated and collected in nunk tubes, stored at -20°C and tested for the presence of syphilis,HBsAg and HCV using Bioline strip test.

4.8.2. Laboratory Testing Methods

Sample testing for Syphilis, HBsAg and HCV was done using; Bioline strip test. It is a qualitative, solid phase, two-site sandwich immunoassay for the detection of Syphilis, HBsAg and HCV in serum or plasma. The membrane is pre-coated with recombinant antigen for Syphilis and HCV .For HBV anti-HBsAg antibodies on the test band region and anti-mouse antibodies on the control band region. During testing, the serum sample reacts with the antibody or antigen that will be coated in the test strip. The mixture then by capillary action reacts on the membrane and generates a red band. Presence of this red band on the control band region and test band region indicates a positive result while its absence on test band region and present on control band region indicates a negative result. Absence of the line on both band regions indicates invalid result.

4.9. Quality Assurance

The collected data were checked daily for consistency and accuracy. Standardized procedures were strictly followed during blood sample collection, storage and analytical process. Positive and negative controls were run alongside of the test.

4.10. Data analysis

The data was analyzed by using SPSS 20 version application for windows. Descriptive method of data analysis was used to get frequency, proportion and percentage of the infection from them collected data .Additionally, we use the cross stab in order to find the related result of one variable with other.The prevalence of syphilis, HBV and HCV was determined from the proportion of the positive individuals in the total population under consideration and expressed as a percentage. They were organized and summarized in terms of frequencies and the results of the study were presented in interpreted by comparing it with standard results and analysis.

4.11 Ethical Consideration

Ethical clearance and approval was obtained from Institutional Review Board of Wolkite University College of Medicine and Health Sciences Department of medical laboratory science and WUSH .The ethical letter was submitted to University College of medicine and health science, permission letter was obtained from Hospital administration. The information sheet and consent form, purpose and importance of the study was explained to each study participants. To ensure confidentiality of participant's information, codes was used where by the name of the participant and any identifier of participants was not be written on the questionnaire. Participant

was interviewed alone to keep the privacy. Voluntary Participation clearly stated that they can choose to participate or not; and they can still receive all the services they usually do if they choose not to participate.

CHAPTER FIVE: RESULTS

5.1. Socio-demographic characteristics

In this study, 127 pregnant women were participated. The mean age was 26.28 years (standard deviation (SD), 4.617; range, 18 –35 years). Higher proportions of the subjects were married (92.1%) and rural dwellers 71 (55.9%). The majority of the study participants were housewives 39(30.7%) followed by other 25(19.7%). About 66 (52%) of the women had primary educational level while 31(24.4%) were had secondary education level. With regard to place previous delivery, 47(37%) were deliver at hospital, 31(24.4%) were deliver at home and 49(38.6%) were not give birth. With regard to stage of pregnancy, 43(33.9%) were under second trimester, 60(47.2%) were third tri-minister, followed by 24(18.9%) first trimester.

Table 1: Socio-demographic characteristics of pregnant women (n=127) attending In WUSH from March, 13/2022 to JUNE, 8/2022 GC

Socio-demographic Characteristics	FREQUENCY	PERCENT[%]
Age(in years)		
18-22	29	22.8
23-27	41`	32.8
28-32	46	36.2
>33	11	8.7
Address		
Urban	56	44.1
Rural	71	55.9

Educational Status		
Illiterate	4	3.1
1-8	66	52
9-12	31	24.4
Diploma and above	26	20.5
Your occupation		
➢ **Unemployed**	21	16.5%
➢ **house wife**	39	30.7%
➢ **Daily laborer**	12	9.4%
➢ **Merchant**	12	9.4%
➢ **Student**	18	14.2%
➢ **Other**	25	19.7%
Marital Status		
➢ **Married**	117	92.1%
➢ **Unmarried**	10	7.
Stage of pregnancy		
1st trimester	24	18.9%
2nd trimester	43	33.9%
3rd trimester	60	47.3%
Is there any abortion		
➢ **Yes**	22	17.3%
➢ **No**	105	82.67%

Where is the place of previous birth ➢ **No birth** ➢ **Health facility** ➢ **Home**	 49 47 37	 38.6% 37% 24.4%

Table 2: clinical characteristics of pregnant women (n=127) attending In WUSH from March, 13/2022 to JUNE, 8/2022 GC

Clinical characteristics	Frequency	Percent
Screening for HBV		
Yes	56	44.1%
No	71	55.9%
Vaccination status		
Yes	13	10.2%
No	114	89.8%
Yes	`13	36.2%
No	114	63.8%
History of hospitalization		
Yes	35	27.6%
No	92	72.4%
History of Surgical procedure		

Yes No	14 113	12.6% 89%
Did have multiple heterosexual activities in your life		
Yes No	16 111	12.6% 87.4%
Have you had a tattoo on the body		
Yes No	30 97	23.6% 76.4%
Is there any genital mutilation		
Yes No	5 122	3.9% 96.1%
HIV/AIDS status		
Positive Negative	4 123	3.1% 96.9%
Hepatitis B status		
Positive Negative	2 125	1.6% 98.4%
Hepatitis C Screened Positive Negative	 89 38	 70.1% 29.9
Syphilis screed		
Positive Negative	16 111	12.6% 87.4%

Hepatitis C status		
Positive Negative	0 89	0% 100%
Syphilis status		
Positive Negative	0 16	0% 100%

5.2 sero prevalence and associated factors of SYPHILIS, HBV and HCV infection

From 127 pregnant women tested for Syphilis, HBsAg and HCV ,0(0%), 2 (1.6%) and 0(0%) result were found. This giving the overall prevalence of 1.6%. sero-positive case for HBsAg was found IN 23-27 age gruop.pregnant women age group of 23-27 years comprised 41(32.3%) of the total study participants ,of which 2(4.8%) were seropositive. There was no statistically significant association between distribution of HBsAg and age categories (p=0.998 , chi =0.2).Majority of study participants were (92.1%) married, of which 1(0.9%) were positive for HBsAg . There was statistically significant association between marital status and HBsAg seropositivity of study subjects(p=0.037 ,chi=0.3).The prevalence of HBV infection in relation to residence revealed that of total 56 urban and 71 rural dwellers, 1(1.8 %) and 1(1.4%).However, no significant association was observed between residence and HbsAg seropositivity (p=0.98 ,chi=0.9).Occupation wise, the highest frequency was observed among daily laborer and merchant 1(8.3%) of each and again aech of them have significant association with HBV (P=0.048 ,chi=0.1). there was no observed significant association for other.Also highest frequency seropositive study subjects was detected among 1-8 level 2(3%) ,however, there was no significant association was observed (p=0.6,chi=0.6).Moreover, none of the other socio-demographic factors, stage of pregnancy (p=0.997 ,chi=0.1) and history of previous birth (p=0.2 chi=0.2) was not significantly associated with HBsAg seropositive(table3).

Table 3: prevalence of HBsAg seropositivity , Screening of Syphilis and HCV and socio demographic characteristics among pregnant women (n=127) attending antenatal care at WUSH, March 13/2022 to Jun8/ 2022 GC.

Socio demographic Variable	Total (%)	HBV (%)		HCV (%)		SYPHILIS (%)	
		POS	NEG	NEG	NS	NEG	NS
Age							
18-22	29(22.8%)	0%	29(100%)	15(51.7%)	14(48.3%)	8(27.65)	21(72.4%)
23-27	41(32.8%)	2(100%)	39(95.1%)	31(75.6%)	10(24.4%)	6(14.6%)	35(85.4%)
28-32	46(36.2%)	0%	46(100%)	33(71.7%)	13(28.3%)	0%	46(100%)
>33	11(8.7%)	0%	11(100%)	10(90.9%)	1(9.1%)	0%	11(100%)
Address							
Urban	56(55.9%)	1(1.8%)	55(98.2%)	39(69.6%)	17(30.4%)	7(12.5%)	49(87.5%)
Rural	71(44.1%)	1(1.4%)	70(98.6%)	50(70.4%)	21(29.6%)	7(9.9%)	64(90.1%)
Educa.status							
illiterate	4(3.1%)	0%	4(100%)	2(50%)	2(50%)	0%	4(100%)
1-8	66(52%)	2(3%)	64(97%)	50(75.8%)	16(24.2%)	8(12.1%)	58(87.9%)
9-12	32(24.4%)	0%	31(100%)	23(74.2%)	8(25.8%)	2(6.5%)	29(93.5%)
>=Deploma	26(20.5%)	0%	26(100%)	14(53.8%)	12(46.2%)	4(15.4%)	22(84.6%)
Occupation							
unemployed	21(16.5%)	0%	21(100%)	13(61.9%)	8(38.1%)	4(19%)	17(81)
H.wife	39(30.7%)	0%	39(100%)	31(79.5%)	8(20.5%)	1(2.6%)	38(97.4%1
Daily laborer	12(9.4%)	1(8.3%)	11(91.7%)	8(66.7%)	4(33.8%)	2(16.7%)	0(83.3%10(
merchant	12(9.4%)	1(8.3%)	11(91.7%)	8(66.7%)	4(33.3%)	2(16.7%)	83.3%15(8
Student	18(14.2%)	0%	18(100%)	11(61.1%)	7(38.9%)	3(16.7%)	3.3%23(92
other	25(19.7%)	0%	25(100%)	18(72%)	7(28%)	2(8%)	%)

Marital status married unmarried	117(92.1% 10(7.9%)	1(0.9%) 1(10%)	116(99.1% 9(90%)	84(71.8%) 5(50%)	33(28.2%) 5(50%)	11(9.4%) 3(30%)	106(90.6%) 7(70%)
previous delivery home Hospital sNo birth	31(24.4%) 47(37%) 49(38.6%)	2(4.1%) 0% 0%	47(95.9%) 47(100%) 31(100%)	37(75.5%) 32(68.1%) 20(64.5%)	12(24.5%) 15(31.9%) 11(35.5%)	10(20.4% 3(6.4%) 1(3.2%)	39(79.6%) 44(93.6%) 30(96.8%)
Gestational age 1st trimester 2nd trimester 3rd trimester	24(18.9%) 43(33.9%) 60(47.3%)	2(8.3%) 0% 0%	22(91.7%) 43(100%) 60(100%)	10(41.7%) 36(83.7%) 43(71.7%)	14(58.3%) 7(16.3%) 17(28.3%)	10(41.7%) 2(4.7%) 2(3.3%)	

Key: pos: positive

Neg: negative

NS : non screend

5.3 Possible risk factors of SYPHILIS, HBV and HCV among the study subjects

Exposure to different possible associated factors for Syphilis, HBV and HCV infection was assessed and determined (using p-value). 16(12.6%) had history of having multiple sexual practice, 18(14.2%) had history of abortion, 30(23.6%) had a practice of body tattooing, 5(3.9%) had history of female genital mutilation, 46(36.2%) had history of blood transfusion.

Among pregnant women who had a history of having multiple sexual practice, 16(12.6%), of these 2 (1.6%) were positive for HBsAg and there was no statistically significant association was obtained (p=0.22) (Table 4).

Table 4: The possible risk factors and prevalence of HBsAg among pregnant women and screening amount for Syphilis and HCV (n=127) attending antenatal care at WUSH, March 13/2022 to June 8/2022 GC.

Variable	Total (n %)		HBV (%)		HCV (%)		Syphilis (%)		P&chi value for HBV
	YES	NO	PO	NE	NO	NS	NO	NS	
History of Abortion	22 (17.3%)	105 (82.6%)	1(50%) 21(16.	1(50%) 104(82.6	16(18%) 73(82%)	9(23.7%) 29(76.3%	5(35.7% 9(64.3%)	17(15%) 94(83.2)	0.998,0.5
Multiple sexual practice	16(12.6%)	111(87.4%)	1(50%) 1(50%)	15(12%) 110(88%	7(7.9%) 82(92%)	9(23.7%) 29(76.3%	12(85.7%) 2(14.3%	4(3.5%) 4(3.5%)	0.22,0.1
History of blood transfusion	46(36. %	81(63.85)	0% 2(100	46(36.8 79(63.2	31(34.2 58(65.2	15(39.5% 23(60.5	5(35.7 9(64.3%	41(36.3% 72(63.7%	0.997,0.3
Body Tattoing	30(23.6%)	97(76.4%)	0% 2(100	30(24%) 95%)	22(24.7 67(75.3	8(21.1%) 30(78.9%	1(7.1%) 13(92.9%)	29(25.7% 84(74.3%)	0.998,0.4
History of surgical procedur	14(12.6%)	113(89%)	0(0) 2(100%	14(11.2) 111(88.)	7(7.9%) 82(92.1%)	7(18.4%) 31(81.6%	3(21.4) 11(78.6)	11(9.7%) 102(90.3%)	0.999,0.6

Genital mutilation	5(3.95)	122(96.1)	0% 2(100%	5(4%) 120(96%	5(5.6%) 84(94.4%)	0% 38(100%)	0% 14(100%)	5(4.4%) 108(95.6%)	0.998,0.8
History of hospitalization	35(27.6%)	92(72.4%)	0% 2(100%)	35(28%) 90(72%)	24(27%) 65(73%)	11(28% 27(71.1%)	1(7.1% 13(92.9%)	34(30.1%) 79(69.9%)	0.998,0.4
HIV/AIDS	4(3.1%)	123(96.1%)	1(50.%) 1(50%)	3(2.4% 122(97.6 %)	3(3.4%) 86(96.6%)	1(2.6%) 37(97.4%)	2(14.3% 12(85.7%)	2(1.8%) 111(98.2%)	0.997,<0.001
Vaccination status	13(10.2%)	114(89.8%)	0% 2(100%	13(10.4 112(89.6	8(9%) 81(91.%	5(13.2%) 33(86.8%	0% 14(100%	13(11.5% 100(85.5%)	0.999,0.6

Key: pos: positive

Neg: negative

Ns : non screend

On the other hand, there was no statistically significant association observed between , history of surgical procedures (p=0.999), history of blood transfusion (p=0.997), history of abortion (p=0.998), body tattooing (p=0.998), history of female genital mutilation (p=0.998) ,history of hospitalization (p=0.998),vaccination status (p=0.999),HIV/AIDS status (p=0.997),multiple hetrosexual activities (p=0.22) with HBV infection (Table 4).

CHAPTER SIX

6.1 DISCUSSION

Syphilis, HBV and HCV infection affecting pregnant women may result in severe disease to the mother and chronic infection to the new-born [1]. Vertical transmission of them to be a major route of transmission in low resource areas [16]. There infection during pregnancy is closely related to high risks of maternal complications including:miscarriage,still birth,preeclampsia, premature contractions, placenta praevia, and preterm delivery, and placental separation, premature rupture of membranes, vaginal bleeding, preterm labour, gestational diabetes mellitus and mortality with a high rate of

Vertical transmission leading to fetal and neonatal hepatitis [17]. In the present study, the overall seroprevalence of Syphilis, HBsAg and HCV in pregnant women attending in WUSH was (0%, 1.6%, and 0%). This shows low endemicity of HBV infection according to WHO criteria. This finding is comparable with the previous studies done among pregnant women in Addis Ababa (2.32%) [30] , (5.3%) in Debre-Tabor Hospital [44], and (2.2%) in yirgalem hospital [32].Similar findings were reported in other developing countries like Burkina Faso (2.2%) [27], Uganda (0.08%) [28], DRC (3.3%) [29] and Kenya (5.3%) [21]. However, a higher prevalence was found among a similar study population in, Nigeria (14.1%) (25), Egypt (4%, 6.4%) [40], Pakistan (4.6%, 7%) [41], and in sub Saharan (ranging from 2.4%-11.8%) [34].. The difference in demographic characteristics of the study population such as socio-cultural environment, behavioral activities, sexual practices, medical exposure and the difference in hepatitis

epidemiology in these countries might explain these discrepancies. In developed nations where regular screening and vaccination of HBV is provided for pregnant women, low prevalence rate (< 2%)[35] was reported in USA, in China (0.3%-1%) [24], in Arabia (1.2%) and Saudi Arabia (1.6%). Similar practices in developing countries may reduce the mother to child transmission and public health significance of Syphilis, hepatitis B and C virus infection.

Regarding socio-demographic status & risk factors of the study participants, All of the expected variables were not associated with sero-positivity of Syphilis, HBsAg and HCV in this study except marital status (p=0.037) and occupation 3&4 have (p=0.048)..Even though no significant association was seen, highest proportion was observed among who have multiple sexual activities and which might be due to low level of awareness about transmission of Syphilis, HBV, HCV and method of prevention. This agrees with research conducted in Addis Abeba [30], Bahir Dar [46], and Debretabor [44]. However, study from Nigeria [25] reported the highest prevalence of HBV infection among pregnant women of 20 to 24 years of age that might by the relationship between HBV infection and high risk sexual practices in this age group but this is contrasted with our study because the highest prevalence of HBsAg was found under age group of 23-27. Such discrepancy could be due to the differences in study design, small sample size, population and geographical area.

Although no statistically significant difference with residence , the prevalence amount is the same to the addresses which is 1(1.8%) to urban and 1(1.4%) to rural.The HBsAg positivity rate among those tested not varies by gestational age with in 2nd and 3rd (0.78%) of each. . . In the present investigation, when previous place of delivery prevalence was considered, pregnant women those who had previous delivery at home had highest prevalence (1.6%). This might be justified by unsafe delivering system at home (contamination of materials during traditional birth).Repeated use of old and unsterilized instruments during delivery by uneducated and unskilled birth attendants may also account for this observation. Therefore, it is plausible to suggest that engagement in these activities could have exposed pregnant women to HBV infection.

Even though there were no significant association was observed between history of multiple sexual exposure and HBV infection, Individuals who had multiple sexual partners were at high risk of acquiring HBV infection, who also demonstrated a history of multiple sexual partners to

be significant risk factors for HBV infection during pregnancy. Changes in sexual practice and behavior modification and having knowledge about the transmission and prevention may therefore be an important step to reduce of hepatitis B infection.

Unlike the previous studies that showed, previous history of blood transfusion and surgical procedures were the risk factor for HBV transmission, none of the these factors showed an association in our study . This may due to the strengthening screening of HBsAg and HCV during blood donation and improvement of sterilized and aseptic techniques and technologies during surgical procedures.

In contrast of our study tattoo for cosmetics had no association with the HBsAg seropositivity .This may due to increase in awareness in harmful traditional practice and unsafe traditional decorations.

Previous report shows that universal prenatal screening for HBsAg is cost effective if the HBsAg carrier rate is greater than 0.06%. Thus, our findings affirmed the need for routine HBsAg screening among pregnant women in developing countries like Ethiopia.

Although WHO recommended that hepatitis B vaccine be incorporated into routine infant and childhood immunization program for all countries by 1997, only130 of 216 countries introduced hepatitis B immunization in to their national infant and childhood immunization programs by the beginning of 2001. The major hurdle to universal hepatitis B immunization is the cost of hepatitis B vaccine, especially for developing countries. Even though the price of hepatitis B vaccine for developing countries has dropped from about $3.00 per dose in 1990 to as low as $ 0.30 per dose in 2001, the cost of three doses of hepatitis B vaccine remains higher than the cost of other vaccines included in routine infant immunization programs .

6.2 CONCLUSION

Low prevalence rates of HBsAg and there was no prevalence (0%) for Syphilis and HCV were detected in this study. No association was observed in acquisition of Syphilis, HBV and HCV infection and socio-demographics and variables except multiple sexual exposures was found to be important indicators of HBV infection in this study. Multiple sexual partner ship plays a significant role in the transmission of the virus from the infected person to the healthy women of child bearing age. There should be routine screening of all pregnant women for hepatitis B infections for possible early immunization of infants of seropositive mothers. Molecular characterization and detection of the other markers should be conducted to determine the exact

prevalence of HBV in future study. Health information on safe sex to women of child bearing age should be given to interrupt the transmission.

6.3 Recommendation

Screening of pregnant women for Syphilis, HBV and HCV should be part of a routine anti natal care in this area as well as in other similar setting of the country. It is better use high sensitive methods, such as FIA, ELISA for laboratories for screening and diagnosis of Syphilis, HBV and HCV. Further large scale epidemiological studies need to be conducted in different parts of the country to ensure the independent predicator of the infection on pregnant women.

Limitation

- Lack of high sensitive method, such as, FIA, ELISA etc.
- Overcrowded time
- Shortage of stripe test kit specially for Syphilis

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ANNEX 1: **English version of information sheet, consent and questionnaire.**

Structured questionnaire for assessing the Syphilis, HBV and HCV at WKUSH.

Questionnaire collector: Code_____ Name_____ Signature_____ Date_____

Checked by: Supervisor Signature_____

Questionnaire identification number_____

Address: city/Sub city _____ Woreda _____Medical Card Number_____

Part 1: socio demographic questions

No	QUESTIONS	Choices of response	Skip
1	Age	age in completed years_____	
2	Sex of the respondents	A. male	

		B. female	
3	Where is your place of residence?	A. urban B. rural	
4	How much income you earn monthly? (Ethiopian birr)	A.<1000 B.1001_2000 C.2001_3000 D.>3000	
5	What is your level of education?	A. Illiterate B. Read and write C. Grade 1-8 D. Grade 9-12 E. College and above	
6	What is your marital status?	A. Single B. Married C. Divorced D. Widowed	
7	What is your current occupation?	A. Student B. Government employee C. Private enterprise employee D. Daily laborer	

		E. Merchant F. No job G. Other specify…….	

DECLARATION SHEET

We declare that this BSC research proposal entitled as sero-prevalence of syphilis ,Hepatitis B&C virus on pregnant women is our original work in partial fulfillment of the requirement for the bachelor of science in medical Laboratory science and it has been carefully acknowledged and referenced in accordance with the requirements.

Name of the principal investigators ID no sign

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2. Ehetenesh Tsega 158/11 _____
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Approved by our advisors:

1. Mr. Admasu Haile(MSc, Medical Microbiology)
   Sign_____
   Date of submission_____
2. Mr. Temesgen Abera(MSc, Assistant Professor)
   Sign_____
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