

**Al-Razi University**  
Graduate Studies  
College of Medical Sciences  
Community Health & Nutrition Department



# **Sero-prevalence and Associated Factors of Viral Hepatitis B and C infection among Pregnant Women in Alaeen Valley, Hadhramout Governorate, Yemen**

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*Thesis Submitted to the Community Health & Nutrition Department College of  
Medical Sciences, AL-Razi University as Partial Fulfillment for MSc. in  
Epidemiology*

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## الإنتشار المصلي والعوامل المرتبطة بعدوى إتهاب الكبد الفيروسي البائي والسيني بين النساء الحوامل في وادي العين محافظة حزرموت-اليمن

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متطلبات نيل درجة الماجستير في الوبائيات

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الباحث

احمد عبد الله نصيب بن بركات  
بكالوريوس في المختبرات الطبية  
المشرف الرئيس

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## CERTIFICATE

This is to certify that the thesis entitled *Sero-prevalence and Associated Factors of Viral Hepatitis B and C infection among Pregnant Women in Aleen Valley, Hadhramout Governorate, Yemen*; is Submitted to Community Health & Nutrition Department, College of Medical Sciences, AL-Razi University for the award master's degree in *Epidemiology*. It is a record of the original and confides research work carried out by *Ahmed Abdullah Naseeb Bin Barkat* under our supervision. Such material as has been obtained from other sources has been duly acknowledged in the thesis. This thesis embodies the work of the candidate himself and no part thereof has been submitted for any other degree.

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# *Dedication*

*This thesis is dedicated to*

*My great parents, who never stop giving of themselves in  
countless ways,*

*My dearest wife, who leads me through the valley of  
darkness with the light of hope and support,*

*My beloved brothers and sister,*

*My beloved kids: Abdullah, Fatima, Barkat &  
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*all my family, the symbol of love and giving,*

*My friends who encourage and support me,*

*All the people in my life who touch my heart.*



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## LIST OF ABBREVIATION

<b>µl</b>	Micron
<b>AASLD</b>	American Association for the Study of Liver Disease
<b>Abs</b>	Antibodies'
<b>ACG</b>	American College of Gastroenterology
<b>Ags</b>	Antigens
<b>AHB</b>	Acute Hepatitis B
<b>ALP</b>	Alkaline Phosphatase
<b>ALT</b>	Alanine Aminotransferase
<b>AST</b>	Aspartate Aminotransferase
<b>CDC</b>	Center for Disease Control and Prevention
<b>CHB</b>	Chronic Hepatitis B
<b>CKD</b>	Chronic Kidney Disease
<b>CLD</b>	Chronic Liver Disease
<b>Cm</b>	Centimeter
<b>DDAs</b>	Direct Acting Antivirals
<b>DNA</b>	DNA Deoxyribonucleic Acid
<b>EHMs</b>	Extrahepatic Manifestations
<b>EIA</b>	Enzyme Immuno Assay
<b>ELISA</b>	Enzyme-linked Immunosorbent Assay
<b>F</b>	Frequency
<b>FDA-approved</b>	Food and Drug Administration approved
<b>HbcAg</b>	Hepatitis B Core Antigen
<b>HbeAg</b>	Hepatitis B Early Antigen
<b>HBeAg+</b>	Hepatitis B Early Antigen Positive
<b>HBIG</b>	Hepatitis B Immunoglobulin
<b>HbsAg</b>	Hepatitis B Surface Antigen
<b>HBsAg+</b>	Hepatitis Surface Antigen Positive
<b>HBV</b>	Hepatitis B Virus
<b>HCV</b>	Hepatitis C Virus
<b>HIV</b>	Human Immunity Virus



<b>HVR1</b>	Hypervariable Region 1
<b>IgG</b>	Immunoglobulin G
<b>IgM</b>	Immunoglobulin M
<b>IL</b>	Interleukin
<b>IRES</b>	Internal Ribosome Entry Site
<b>IU/ml</b>	International Units per Milliliter
<b>Iv</b>	Intravenous Injection
<b>Km<sup>2</sup></b>	Kilometer Square
<b>LFTs</b>	Liver Function Tests
<b>m RNA</b>	Messenger Ribonucleic Acid
<b>ml</b>	Milliliter
<b>MTCT</b>	Mother to Child Transmission
<b>Nm</b>	Nanometer
<b>N</b>	Number
<b>NS</b>	Nonstructural
<b>PCR</b>	Polymerase Chain Reaction
<b>RIA</b>	Radio Immunoassay
<b>RNA</b>	Ribonucleic Acid
<b>SD</b>	SD Standard Deviation
<b>SPSS</b>	Statistical Package for the Social Science
<b>TMA</b>	Transcription Mediated Amplification
<b>TMB</b>	Tetra Methyl Benzidine
<b>TSB</b>	Total Serum Bilirubin
<b>USA</b>	United State America
<b>UTR</b>	Untranslated Region
<b>WHO</b>	World Health Organization

## **ABSTRACT**

### **Background of the study**

Viral hepatitis is a public health problem and challenge globally. Viral hepatitis B & C infection during pregnancy is associated with a high risk of maternal complications including pre-eclampsia, placenta praevia, preterm delivery, placental separation, antepartum hemorrhage, preterm labor, increased incidence of intraventricular hemorrhage, gestational diabetes mellitus, and mortality with a high rate of vertical transmission leading to fetal and neonatal hepatitis. This study underscores the importance of identifying the current sero-prevalence and associated factors of Viral Hepatitis B and C infection among Pregnant women that contribute to helping health authorities in the prevention of HBV and HCV among pregnant women in Alaeen Valley, Hadhramout.

### **Objectives**

The current study aimed to determine the seroprevalence of HBV and HCV infection and associated risk factors among pregnant women attending Antenatal Clinic in Saleh Babker Welfare Hospital Alaeen Valley, Hadhramout Governorate, Yemen.

### **Methods**

A descriptive cross-sectional study was conducted among pregnant women attending obstetrics and gynecology clinic for antenatal care in Saleh Babker Welfare Hospital, Alaeen Valley, Hadhramout Governorate, Yemen. To determine the seroprevalence of hepatitis B and C infection and associated risk factors, the sample size of the target population was calculated to become 300 Yemeni pregnant women attending antenatal clinics in the study area. The sample size was determined by using Epical program version 2000. Pregnant women attending obstetrics and gynecology clinics for antenatal care were consecutively enrolled until the desired sample size was reached. Data was collected using a close-ended questionnaire. Data including socio-demographic characteristics: Age, residence, education level, occupation, marital status, parity, and risk factors and medical history. A blood specimen was collected for detection of HBsAg and Antibodies to Hepatitis C virus. Data coded and entered into SPSS version 21.0 for descriptive and inferential statistical analysis.

## Results

The overall prevalence of hepatitis B and hepatitis C was (3%), and (0,7%), respectively.

The mean age of participating pregnant women was  $\pm$  SD, 29.37 $\pm$  6.572 years, about (70%) of them were from semi-urban area, the vast majority of participants (94 %) were married, more than half (51%) of the target pregnant women had basic education, (83%) of them were housewives, and (72%) of them had multigravida. The total (100%) of pregnant women have not had a medical history of taken vaccination to HBV, and not tested for HBV&HCV and there was no history of tattoo. While only (12%) of the participants have had a history of blood transfusion and (17%) of the participants have had a history surgery and (2%) of the participants have had a history liver disease, more than half (63.3%) of them have had a history of dental procedures and (2%) of the participants have had a cupping and in finely (100%) of them had ear piercing. The positivity of prevalence for HBsAg was: about (29.4%) among the age group 37 years and above, (3.3%) among the pregnant women from the semi-urban area, about (5.3%) were with the secondary school educational level, about (5.9%) were separated regarding marital status, and (3.2%) were housewife, and (3.2%) were multi gravida. The positivity of prevalence for Anti HCV was: about (2%) among the age 27-36 years, (1.1%) among the pregnant women from the urban area, about (1.2%) were with the illiterate educational level, about (0.7%) were married regarding marital status, and (0.8%) were housewife, and (1.2%) were primary gravida.

Regarding the overall sero-prevalence of HBsAg and Anti HCV only (3%) and (0.7%) of the participating pregnant women had a positive sero-prevalence of HbsAg and Anti HCV, respectively. The prevalence of HBsAg was about (8%) and the prevalence of anti HCV was (2.8%) among the pregnant women who had a history of blood transfusion. The prevalence of HBsAg was about (66.7%) and the prevalence of anti HCV was (0.7%) among the pregnant women who had a history of liver diseases. The prevalence of HBsAg was about (3.9%) and the prevalence of anti HCV was (2%) among the pregnant women who had a history of surgery, the prevalence of HBsAg was about (3.2%) and the prevalence of anti HCV was (1.1%) among the pregnant women who had a history of dental management. In addition, the prevalence of hepatitis HBsAg (3%) and anti HCV (0.7%) among the participating pregnant women who had a history of ear piercing.

## **Conclusion**

The sero-prevalence of HBsAg was (3%) of moderate severity among the participating pregnant women according to WHO. The sero-prevalence of anti-HCV was found to be (0.7%) among the participating in pregnant women.

There was no statistically significant association between the overall prevalence of hepatitis B virus and hepatitis C virus infection and the demographic characteristics of pregnant women who participated in the study at (P-value >0.05). Although there was a statistically significant association between the overall prevalence of hepatitis B virus infection and the history of liver diseases and the history of blood transfusion of pregnant women at level (P-value <0.05).

## **Recommendations**

Based on the results of the study we recommend:

Introduction of routine screening for HBV and HCV for all pregnant women attending antenatal clinics in health care centers or hospitals during the antenatal period, using standard precaution and infection control measures to all risk factors, such as blood transfusion, surgery history, liver disease history, dental management, and had an ear-piercing that increasing prevalence of HBV and HCV infection.

Vaccination for HBV is given at birth to newborn infants of mothers found to be HBsAg positive so as to reduce and prevent the spread of infection. However, more data is required from larger studies to support the findings so that, ultimately, this can be recommended as a policy.