Archives of Health Science
Research Article

Frequency of Hepatitis C Virus Infection among Pregnant Women Attending Jiblah University Hospital, Yemen

[1]Dr. Sadeq Kaid Mohammed Al-Mohani, [2]Amal Saleh Qaid Al-qoh, [2]Nila Sadiq Mohammed Awn, [2]Alya Abdalwasa Ali Alasabh, [2]Rayan Abdusalam Aqeel, [2]Haidi Abdullah Hasan Humran, [2]Ola'a Abdo Ahmed Naji Al-Majidi, [2]Dalia Yahya Ali Mohammad Al-Mofti, [2]Hadeel Ali Abdo Mohammed Alzrai

[1]PhD. Biotechnology, Dean of Faculty of Medical Laboratories, Jiblah University for Medical and Health Science, Yemen.
[2]Faculty of Midwifery, Yemen.

***Corresponding author:** Dr. Sadeq Kaid Mohammed Al-Mohani, PhD. Biotechnology, Dean of Faculty of Medical Laboratories, Jiblah University for Medical and Health Science, Yemen.

Received : 09-04-2024 **Accepted :** 16-04-2024 **Publication :** 23-04-2024

Abstract

Background: Hepatitis C Virus is a major public health burden all over the world. It can be directly transferred from pregnant women to their fetuses. In Yemen, there is a paucity data in the prevalence of infection among pregnant women.

Objective: To evaluate the prevalence of hepatitis C virus among pregnant women in the delivery room at Jiblah University Hospital in Ibb Governorate, Yemen.

Methods: A cross-sectional study was conducted during October–December 2023 to investigate the seroprevalence and associated risk factors for markers of anti-HCV antibody among pregnant women at Jiblah University Hospital in Ibb Governorate, Yemen. Structured questionnaires were used to obtain sociodemographic obstetrics and medical data and sera were tested for anti-HCV.

Results: Of the 154 pregnant women enrolled in the study, anti-HCV was detected in 4 (2.6%). This study showed that contraceptive use and previous blood received were significantly associated with HCV seropositivity (p< 0.04) (p< 0.004), respectively. No other sociodemographic factors (age, residence, condition education, monthly income, types of delivery, and parity) were significantly associated with anti-HCV seropositivity.

Conclusion: The finding of this study indicated that the magnitude of hepatitis C virus infection among pregnant women was intermediate level. Modifiable risk factors, contraceptive use and previous blood received.

Keywords: HCV, risk factor, pregnant women, Ibb, Yemen

Introduction

Viral hepatitis is a major public health burden all over the world [1,2]. It is responsible for an estimated more than 10 million new infections and 1.34 million deaths [3]. In 2016, the WHO Global Health Sector Strategy called for Hepatitis elimination by 2030, with a target of reducing new infections by 90% and mortality by 65% compared to the 2015 baseline [2,4]. The global prevalence of Hepatitis C Virus (HCV) infection is 2% to 3%, with 130 to 170 million HCV-positive people, leading to 1.5 million new infections and around 350,000 to 500,000 deaths annually [5,6-7]. In most developing

countries, HCV remains under diagnosed and under reported even it is highly infectious [8]. The prevalence of HCV infection in pregnant women is predicted to be 1-8% worldwide [9]. HCV mother-to-child transmission occurs at an overall rate of 5% to 15%, with 3% to 5% progressing to chronic infection [10]. Maternal HCV infection during pregnancy is associated with a high risk of maternal complications including gestational diabetes, preterm delivery, placental separation, vaginal bleeding, premature rupture of membranes, intrahepatic cholestasis and mortality [11]. Neonate complications include a high risk of neonatal hepatitis that can lead to liver cirrhosis and hepatocellular carcinoma in young adults and intrauterine growth restriction, as well as, congenital anomalies [12]. In the Arab World, HCV is a persistent issue, where the average prevalence rate of HCV ranges between 0.4-23% [13]. A study, conducted in Sana'a, Yemen, reported that the prevalence of HCV among pregnant women is 8.5% [14]. Jiblah University Hospital is located in Jiblah town, south of Ibb Governorate. The hospital was established in 1965 by the American Baptist Association and was called American Baptist Hospital. In 2003, Ministry of Public Health and Population in Yemen took over the hospital and changed its name to Jiblah Hospital then Jiblah University Hospital. The Obstetrics and Gynecology Department at Jiblah University Hospital provides maternity and childhood care to women and pregnant women coming to the hospital from Ibb and neighboring governorates and receives referrals from other clinics and hospitals [15]. There is a paucity of information about the prevalence of hepatitis C virus among pregnant women in Yemen. To our knowledge, a similar study has not been conducted in the study area. Therefore, this study aimed to determine the prevalence, demographic distribution, and risk factors associated with hepatitis C virus infection among pregnant women at delivery room in Jiblah University Hospital.

Materials and Methods

This hospital-based cross-sectional study was conducted at delivery room in Jiblah University Hospital in Ibb Governorate, Yemen, on 154 pregnant women selected by random sampling from October to December 2023. Pregnant women who did not provide consent were excluded from the study. Data were collected by face-to-face interview using a pretested structured questionnaire. A blood sample was collected and tested for HCV antibodies using commercial kits (One step anti-HCV Test, Intec, China). HCV positive samples were confirmed by enzyme immunoassay (EIA) for Hepatitis C antibodies with commercially kits (Fortress Diagnostic Ltd. UK). Collected data were analyzed by using SPSS version 26 software. The Chi-squared test was employed to determine the statistical difference. The significance level was set at p value <0.05.

Results

A total of 154 volunteers pregnant women were included in this study. The mean age of the study participants was 26.7 (SD ± 6.31) years and it ranged from 16 to 43 years. Most of the population was within the age range of 22-27 years old. More than half of the participants (58.3%) were urban residents, and about 67 (44%) of the women had educational level below secondary school. Sociodemographic details and other characteristics are shown in Table 1.

Table1. Sociodemographic characteristics of pregnant women in association with the HCV infections (n=154).

Variable	NO. (%)	Anti-HCV		*P** value
		Positive NO. (%)	Negative NO. (%)	
Age (years)				0.118
16-21	43 (28)	0 (0.00)	43 (100)	
22-27	48 (31)	1 (2.10)	47 (97.90)	
28-33	31 (20)	1 (3.20)	30 (96.80)	
34-39	27 (18)	1 (3.70)	26 (96.30)	
≥40	5 (3)	1 (20)	4 (80)	
Residence				
Urban	89 (58)	2 (2.20)	87 (97.80)	0.749
Rural	65 (42)	2 (3.10)	63 (96.90)	
Educational status				
Illiterate	27 (18)	2 (7.40)	25 (92.60)	0.541
Basic	67 (44)	1 (1.50)	66 (98.50)	
Secondary	52 (34)	1 (1.90)	51 (98.10)	
Graduated	8(6)	0 (0.00)	8 (100)	
Monthly income				
≤. 50 USD	83 (54)	3 (3.60)	80 (96.40)	0.616
> 50 – 100 USD	50 (32)	1 (2)	49 (98)	
> 100 USD	21 (14)	0 (0.00)	21 (100)	
Types of Delivery				
Normal	83 (54)	2 (2.40)	81 (97.60)	0.874
Cesarean	71 (46)	2 (2.80)	69 (97.20)	
Parity				
0-1	51 (33)	0 (100)	51 (100)	2.035
2-4	78 (51)	3 (3.80)	75 (96.20)	
>4	25 (16)	1 (4)	24 (96)	
Contraceptive using				0.04
Yes	76 (49)	4 (5.30)	72 (94.70)	
No	78 (51)	0 (0.00)	78 (100)	
Previously received blood				
Yes	29 (19)	3 (10.30)		0.004
No	125 (81)	1 (0.80)		

** p < 0.05 is considered as significant.*

Among all participants, 4 (2.6%) tested positive for anti-HCV as shown in Figure 1.

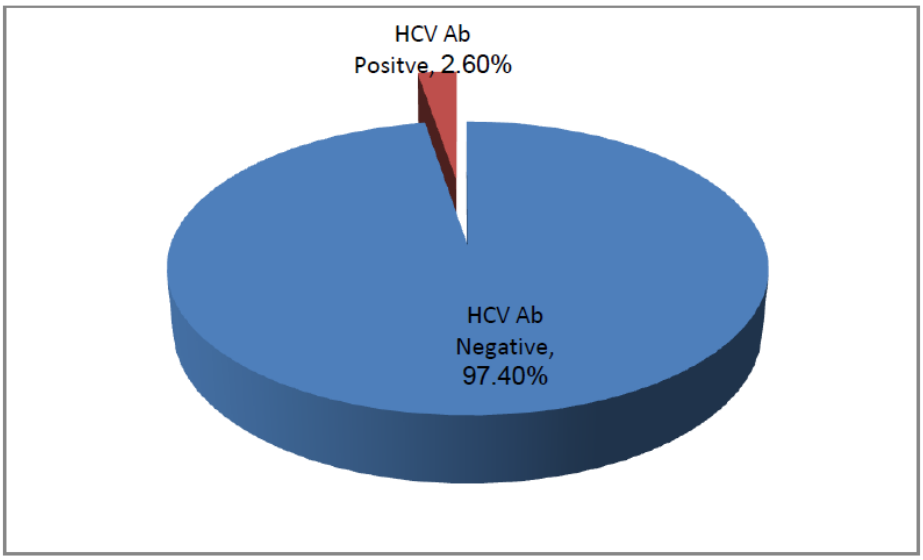

Figure1: Seroprevalence of hepatitis C infection among the study subjects

The results of the current study revealed that age, residence, educational status, monthly income, delivery type, and parity were not significantly associated with HCV seropositivity. However, HCV status was significantly associated with contraceptive use and previously received blood ($p < 0.04$) ($p < 0.004$), respectively.

Discussion

HCV infection is an emerging public health concern worldwide and affects millions of people every year (4). HCV infection during pregnancy is associated with a higher risk of maternal complications and poor birth outcomes, and is also transmitted from mother to offspring [7]. The seroprevalence of HCV antibodies during pregnancy in different settings is needed to be investigated to prevent vertical transmission and may be a good indicator of general population prevalence. According to WHO definitions, there are three levels of endemicity for HCV infection: low endemicity (1.5%), intermediate endemicity (1.5%-3.5%), and high endemicity (>3.5%) [16]. In the present study, the prevalence of HCV infection among pregnant women was 2.6% and it was higher than the finding from studies carried out in Ethiopia 2.2% [6], Pakistan 1.42% [1], Nigeria 1.3%, Iraq 0.8% [17], Saudi Arabia 0.7% [18], USA 0.24% and in China 0.11% [7]. On the other hand, the prevalence of HCV Ab in the present study was lower than the finding from studies conducted in Egypt 6.1% [19], Punjab, India 4.80% [20] and Russian 2.8% [21]. From previous studies conducted in different regions in Yemen, the prevalence of HCV among the general population ranged between 0.07%-8.5% [22] and among pregnant women 8.5% [14]. This study reported a prevalence of HCV among pregnant women of 2.6%, which is lower than previously reported. Differences between these and previous findings could be attributed to differences in geographic location, different socioeconomic status, and lack of awareness of HCV infection among pregnant women in certain areas. Regarding factors associated with HCV seropositivity, previously received blood were significantly associated with HCV infection among pregnant women ($p < 0.004$), respectively. The finding from the present study was consistent with study reports from Yemen [14], Egypt [23], Ethiopia [6], and Pakistan [24] reporting that blood transfusion has been recognized as a risk factor for the acquisition of HCV infection. In contrast to the present study, a study from Nigeria found that blood transfusion had no significant association with contracting HCV infection [25]. Differences in demographics, cultural practices and behavior of the study population for the risk of HCV infection might explain these discrepancies. Contraceptive use was found to be a significant factor of HCV positive rate in the present study ($p < 0.04$).

Conclusion

The evidence obtained from this study may help healthcare workers and other concerned bodies to identify gaps in HCV screening during ANC; improve knowledge on the epidemiology of HCV infection among pregnant women in Yemen; and increase awareness of the general population regarding the epidemiology of HCV. It is important for all pregnant women to undergo screening during prenatal care and to have a well-implemented management strategy in place.

Author's Contribution

Authors have read and approved the final version for submission to this journal, and agree to be accountable for all aspects of the work.

Acknowledgements

Authors would like to thank Dr. Mohammed Abduh Khoshafah and Miss Ahalam Alsaber for their appreciated participation.

References

[1] Ahmad I. Prevalence of Hepatitis B and C Viral Infection Among Pregnant Women in Peshawar, Pakistan. Hepat Mon. 2016 Jun 1;16(6):e36383. doi: 10.5812/ hepatmon. 36383. PMID: 27630725; PMCID: PMC501 1400

[2] Al-Mohani SK: Seroepidemiology and risk factors of Hepatitis B virus in Jiblah town, Yemen. Universal Journal of Pharmaceutical

Research. 2022, 8:67-70. DOI: 10.22270/ujpr.v8i2.928

[3] Chilaka VN, Konje JC. Viral Hepatitis in pregnancy. Eur J Obstet Gynecol Reprod Biol.2021;256:287-296.doi:10.1016/j.ejogrb. 2020.11.052

[4] Liu J, Wang X, Wang Q, et al. Hepatitis B virus infection among 90 million pregnant women in 2853 Chinese counties, 2015-2020: a national observational study. Lancet Reg Health West Pac. 2021; 16:100267. Published 2021 Sep 5. doi:10.1016/j.lanwpc.2021.100267

[5] Shao Z, Al Tibi M, Wakim-Fleming J. Update on viral hepatitis in pregnancy. Cleve Clin J Med. 2017;84(3):202-206. doi:10.3949/ccjm.84a.15139

[6] Nuruzelam Mohammed, Jeylan Kassim, Ahmednur Adem Aliyi, Muhammed Jemal Abdurebi. (2023). Sero-prevalence of Viral Hepatitis B and C infection and associated factors among Pregnant Women in Southeast Ethiopia: Community-based crossectional study. Qeios. doi:10.32388/GFRI7U.

[7] Deng Q, Lin L, Guo W, Deng X, Zhang Q, Hou J. Prevalence of hepatitis B virus infection among pregnant women in the mountainous regions of southern China: A retrospective single-center study. J Clin Lab Anal. 2023 Jan;37(2):e24837. doi: 10.1002/jcla.24837. Epub 2023 Jan 5. PMID: 36604811; PMCID: PMC9937878.

[8] World Health Organization. (2013). *Global Policy Report on the Prevention and Control of Viral Hepatitis in WHO Member States*. Geneva, Switzerland

[9] Khan AR, Waqar S, Rafiq Z, Ullah R, Wazir MH, Gul AM. Frequency of Acute Viral Hepatitis A, B, C, and E in Pregnant Women Presenting to Hayatabad Medical Complex, Peshawar, Pakistan. Cureus. 2022 Apr 17; 14(4):e24208. doi: 10.7759/ cureus. 242 0 8. PMID: 35602792; PMCID: PMC9117829.

[10] Shata MTM, Hetta HF, Sharma Y, Sherman KE. Viral hepatitis in pregnancy. J Viral Hepat. 2022 Oct;29(10):844-861. doi: 10.1111/jvh.13725. Epub 2022 Jul 7. PMID: 35748741; PMCID: PMC9541692.

[11] Chappell CA, Jonas MM. Hepatitis C Virus in Pregnancy: Are We Ready for Test and Treat? J Infect Dis. 2020 Nov 27;222(Suppl 9):S789-S793. doi: 10.1093/infdis/jiaa181. PMID: 33245353; PMCID: PMC8171805.

[12] Dessalegn Mekonnen B. Prevalence of Hepatitis C Virus Infection among Pregnant Women in Ethiopia: A Systematic Review and Meta-Analysis. Adv Prev Med. 2021 May 28;2021:6615008. doi: 10.1155/2021/6615008. PMID: 34136287; PMCID: PMC8177971.

[13] El-Shabrawi MHF, Kamal NM, Mogahed EA, Elhusseini MA, Aljabri MF. Perinatal transmission of hepatitis C virus: an update. Arch Med Sci. 2019 Mar 15;16(6) :1360-1369. doi: 10.5114/aoms. 2019.83644.PMID:33224335; PMCID: PMC7667440.

[14] Murad EA, Babiker SM, Gasim GI, Rayis DA, Adam I. Epidemiology of hepatitis B and hepatitis C virus infections in pregnant women in Sana'a, Yemen. BMC Pregnancy Childbirth. 2013;13:127. Published 2013 Jun 7. doi:10.1186/1471-2393-13-127

[15] Sadiq Kaid Al-Mohani, Rawia Ali Alodeny, Sally Ali Alodeny, Asma'a basher Al-Sharaei, Sondos Faisal Al-Bokhiti et al.; Predict Risk Factors Of Preeclampsia Among Pregnant Women Attended Antenatal Care Clinic At Jiblah University Hospital, Yemen: A Cross Sectional Study. International Journal of Current Research, 2023;15;6 :pp.24976-24979. DOI: 10.24941/ijcr.45503.06.2023

[16] World Health Organization. (2016). Hepatitis (Online) Global Health Sector Strategy on Viral Hepatitis 2016–2021 Towards Ending Viral Hepatitis. [Internet]. https://apps.who.int/iris/bitstream/handle/10665/246177/WHO-HIV-2016.06-

[17] Hussein N.R. , Sharaf H.A., Mahdi S.:The Prevalence of Hepatitis C Virus Infection in Pregnant Women in Duhok City, Kurdistan Region of Iraq: A Brief Report. Women Health Bull. 2019 April; 6(2):e91494. doi: 10.5812/whb.91494.

[18] Zrieq R, Algahtani F, Ali R, Al-Najjar M, Suleiman S, Alshammari F, et al. The decline in hepatitis B and C in women: A 5-year retrospective case study in Ha'il, Saudi Arabia. Avicenna 2022(2):10. http://doi.org/10.5339/avi.2022.10

[19] Khamis HH, Farghaly AG, Shatat HZ, El-Ghitany EM. Prevalence of hepatitis C virus infection among pregnant women in a rural district in Egypt. Trop Doct. 2016; 46(1):21-27. doi:10.1177/0049475514561330

[20] 31) Pandey, S.; Lohani, P.; Roy, R.; Bhar, D.; Ranjan, A.; Kumar, P.; Singh, C. Prevalence and Knowledge of Hepatitis B Infection in Pregnant Women in a Primary Health Center of Patna District, Bihar. Journal of Family Medicine and Primary Care 2021, 10(10), 3675-3681

[21] 28) Pokrovsky, V.I.; Totolyan, A.A.; Viral hepatitis in Russian Federation: Analytical review. 10th edition. St. Petersburg: FBUN NIIEM named after Pasteur. 2016, p 152.

[22] ALMAHBASHI AAA. Hepatitis C virus epidemiology in Yemen: Systematic review. The Turkish Journal of Academic Gastroenterology 2021;20:49-58. DOI: 10.17941/agd.923259

[23] Abdelkader and Ibrahim, Afro-Egypt J Infect Endem Dis 2020;10(2):200-206 https://aeji.journals.ekb.eg/http://mis.zu.edu.eg/ajied/home.aspx

[24] Abdul Rauf, Muqaddas Tahir, Humaira Abid, et al.: A High Prevalence Of HBV and HCV Infections Among Pregnant Women: A Prospective Cross Sectional Study. Vol. 31 No. 01 (2024): JPTCP (75-89). DOI: 10.53555/jptcp.v31i1.3814

[25] Eleje GU, Rabiu A, Mbachu II, et al. Awareness and prevalence of hepatitis C virus infection among pregnant women in Nigeria: A national pilot cross-sectional study. Womens Health (Lond). 2021; 17:174550 652 11031718. doi:10.1177/17455065211031718

Citation: Dr. Sadeq Kaid Mohammed Al-Mohani et al., (2024), "Frequency of Hepatitis C Virus Infection among Pregnant Women Attending Jiblah University Hospital, Yemen", Arch Health Sci; 8(1): 1-6.

DOI: 10.31829/2641-7456/ahs2024-8(1)-011