

Knowledge of healthcare workers on vertical transmission of hepatitis at a secondary healthcare facility in Northern NigeriaChikwendu Amaike,^{1,2} Libby U Harry,^{3,4} Alexandra O Odiari,² Tolulope O Afolaranmi,⁵
Olumide Abiodun,^{1,2} Amaka N Ocheke⁶**Abstract**

Background: Viral hepatitis is a major global public health challenge. Hepatitis B virus (HBV) and Hepatitis C virus (HCV) lead to chronic diseases in several millions of people. They can be spread by mother to child transmission (MTCT) at birth. Awareness of healthcare workers (HCWs) on MTCT of HBV and HCV is key in the prevention. Hence, we sought to assess the knowledge of HCWs on MTCT as a route of transmission of the HBV and HCV.

Methods: The study was cross-sectional. Respondents were selected using simple random sampling technique. Data collection was by self-administered questionnaires and data was analyzed using SPSS version 23. Chi-square test was done to determine the relationship between sociodemographic characteristics and the level of knowledge, and at 95% confidence interval, a P-value less than 0.05 was considered to be statistically significant.

Results: Eighty-one HCWs participated in this study, with 50 (51.7%) females. The mean knowledge score was 7.76 ± 1.60 with 22 (27.2%) of the respondents having good knowledge. Twenty-two (27.2%) and 24 (29.6%) of the HCWs knew respectively that HBV and HCV could be by MTCT. There was a statistically significant relationship between cadre of HCW and level of knowledge ($p < 0.01$).

Conclusion: Most of the HCWs had poor knowledge on MTCT of viral hepatitis. Majority of them did not know MTCT as a route of transmission of viral hepatitis. We recommend that HCWs need retraining to improve knowledge on MTCT of viral hepatitis.

Keywords: HBV, HCV, mother-to-child-transmission, HCWs

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Introduction

Hepatitis is an inflammation of the liver resulting from infections from various viruses and some noninfectious agents. Types A, B, C, D and E are the main strains of the hepatitis viruses. Hepatitis B virus and HCV infections lead to chronic diseases and they are the most common causes of liver cirrhosis, liver cancer and deaths from viral hepatitis infections. About 354 million people globally are living with HBV and HCV.¹

Hepatitis B Virus is most commonly spread by MTCT at birth. It is also spread through horizontal transmission, from an infected child to an uninfected child during the first five years of life following exposure to infected blood. Horizontal transmission can also occur during sex with an infected partner.²

There is a safe and effective vaccine against HBV. Three doses of the vaccine given at 4 weeks intervals for adults as a stand-alone vaccine. Children are given an

initial dose of HBV vaccine at birth, then 3 doses of a pentavalent vaccine from 6 weeks of birth at 4 weekly intervals.³ Vaccination provides about 98%-100% protection which lasts for about 20 years and maybe lifelong probably due to memory immune response.⁴ However, in the absence of any preventive interventions, the risk of MTCT of HBV for mothers with high HBV viral load or are Hepatitis B envelop Antigen (HBeAg)-positive ranges from 70% to 90% and from 10% to 40% among those who are HBeAg negative.⁴

Furthermore, HCV is transmitted through the skin when exposed to infected blood, from MTCT and by sharing of contaminated objects. The rate of MTCT is about 5%. Children who are infected during the perinatal period develop cirrhosis in earlier age than those who acquire HCV as adolescents. Pregnant women with cirrhosis have a higher risk of poor maternal and neonatal outcomes than those without cirrhosis.^{5,6} There is no effective vaccine against HCV so prevention includes reducing the risk of exposure to the virus among women within the reproductive age.⁵ Although antiviral medicines can cure more than 95% of persons infected with HCV, these antiviral drugs are however contraindicated in pregnancy making prevention of MTCT difficult.^{6,7}

Awareness of HCWs on MTCT as a route of transmission of HBV and HCV is key in the prevention, although some HCWs are not aware that the viruses can be transmitted via this route.⁸ Studies in China and Ethiopia have assessed the knowledge of MTCT of HBV and HCV infections among pregnant women attending

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antenatal clinics (ANC) and found that most of the women did not know that viral hepatitis transmission could be by MTCT.^{9,10} However, in Nigeria and some low-and-middle-income countries (LMICs), few studies have assessed the knowledge of HCWs on MTCT of HBV and HCV infections. In Ghana, a study among doctors and midwives showed that the HCWs had good knowledge on MTCT of hepatitis but had some knowledge gap on the modes of prevention.¹¹ Another study in Nigeria among doctors reported that some of the respondents did not know that hepatitis could occur by MTCT.¹² These gaps in the knowledge of MTCT of hepatitis and modes of prevention among HCWs could affect the prevention of the infection as HCWs with poor knowledge will have inadequate information to pass to the pregnant women on the prevention on MTCT of viral hepatitis.

Most HCWs have not had any training on MTCT as a route of transmission of the infections since they completed their formal trainings.¹¹ This is a challenge to the reduction of the burden of hepatitis as most of the pregnant women attending ANC care depend on the HCWs for health-related information. Therefore, this study was conducted to assess the knowledge of HCWs on MTCT as a route of transmission of HBV and HCV infections in order to inform policy on equipping HCWs with information on the vertical transmission of viral hepatitis and modes of prevention.

Methods

Study Area

This study was done at Seventh-day Adventist (SDA) Hospital, a secondary healthcare facility in Bassa, North-central Nigeria and the eight primary healthcare centres supervised by the Hospital which are in North-central and North-west regions of Nigeria. The hospital has 68 beds while the clinics have 48 beds. The hospital runs ANC ones a week and screening for HBV and HCV are done as routine laboratory investigations for pregnant women, using rapid diagnostic test kits to detect the presence of Hepatitis B virus surface antigen (HbsAg) and HCV antibodies respectively. An average of eight new pregnant women per week visits the booking clinic.

Study Design

The study was cross-sectional, assessing the knowledge on MTCT as a route of transmission of HBV and HCV among the HCWs. Data collection was done in 2021.

Study Population and Sampling Technique

The study involved HCWs in the hospital who provided care for pregnant women. Cadre of HCWs included doctors, nurses, laboratory technicians, pharmacist and pharmacy technicians, community health extension workers (CHEWs), junior community health extension workers (JCHEWs) and attendants. This is the situation

in this hospital due to inadequate skilled HCWs. Simple random sampling technique by balloting was used to select the study participants.

Sample size determination

Appropriate sample size formula¹³ was used to determine the minimum sample size, with the component parts, Z_{α} as the value of alpha error at 95% confidence level given as 1.96, P as prevalence (73.4%) of HCWs with knowledge about MTCT of HBV from a study in Cameroon⁸ and d is the precision set at 10% of 73.4%. A 5% non-response rate was added given a minimum sample size of 81.

Inclusion criteria

HCWs involved in providing care for pregnant women attending ANC in the hospital. However, those who were on leave and off duties, those involved in administrative duties during the time of data collection and those who did not give consent were excluded.

Data collection

Prior to data collection a visit was paid to the heads of the units involved in this study to inform them about the study and get their support. Self-administered questionnaire adapted from previous studies was used. Questionnaire was pretested among similar HCWs in a secondary healthcare facility in a neighbouring state. This was to correct for any ambiguity and for assessment of face validity. Three research assistants (doctor, nurse and laboratory technician) were involved in the data collection. Questionnaire was answered in the presence of the research assistants in order to prevent respondents from sharing information and to ensure completeness of questionnaires.

Data Analysis

Data was processed and analyzed using IBM SPSS version 23, Armonk, New York, United States of America. Mean and standard deviation was used to summarize knowledge score. Knowledge was assessed using 7 questions. Each correct response was scored 2 and a wrong response 1. Maximum attainable score was 14 and minimum was 7. Level of knowledge was graded as good and poor. Respondents with score of 11 and below were considered as poor while above 11 were considered as good. Bivariate analysis was done to assess the association between level of knowledge (dependent variable) and sociodemographic characteristics (independent variables). At 95% confidence interval, a $P < 0.05$ was considered statistically significant.

Ethical considerations

Written permission was sought and obtained from the Institutional Review Board of SDA Hospital, Jengre

before commencing this study. Also, written informed consent was obtained from the study participants.

Result

Eighty-one HCWs were studied, more females 50 (51.7%) than males 31 (38.3%). Age group 26-35years had the highest frequency, 28 (34.6%). Forty-six (56.8%) of the respondents have worked for less than 6 years, while JCHEWs and CHEWs had the highest number 30 (37.0%), Table 1.

TABLE 1-Sociodemographic characteristics

Variable	Frequency	Percentage
Age (years)		
16-25	22	27.2
26-35	28	34.6
36-45	17	21.0
46-55	09	11.1
56-65	05	6.2
Sex		
Female	50	61.7
Male	31	38.3
Level of Education		
Primary	02	2.5
Secondary	30	37.0
Tertiary	49	60.5
Cadre		
Pharmacist/technician	07	8.6
Laboratory technician	10	12.3
Doctors	05	6.2
Nurse/Midwife	12	14.8
CHEW/JCHEW	30	37.0
Ward attendants	17	21.1
Years of working		
< 6	46	56.8
6-10	12	14.8
11-15	09	11.1
16-20	02	2.5
> 20	12	14.8

The mean knowledge score was 7.76 ± 1.60 with 22 (27.2%) of the respondents having good knowledge while 59 (72.8%) had poor knowledge. Knowledge of MTCT as a mode of transmission of HBV and HCV was found among 22 (27.2%) and 24 (29.6%) respectively of the respondents, Table 2.

There was a statistically significant association between cadre of HCWs and level of knowledge (P = 0.01), Table 3.

Table 2: Knowledge on MTCT of HBV and HCV

Variables	Yes Frequency (%)	No Frequency (%)
Aware of MTCT of HBV	22 (27.2)	59 (72.8)
Aware of MTCT of HCV	24 (29.7)	57 (70.3)
When can MTCT of HBV occur		
Pregnancy	70 (86.4)	11 (13.6)
Labour	17 (21.0)	64 (79.0)
Breastfeeding	69 (85.2)	12 (14.8)
Prevention of MTCT of HBV with HBV vaccine	19 (23.5)	62 (76.5)
Prevention of MTCT of HCV with antiviral drugs	60 (74.1)	21 (25.9)
Knowledge on MTCT of HBV and HCV	Frequency	Percentage
Good	22	27.2
Poor	59	72.8
Mean Knowledge score	7.76 ± 1.60	

Discussion

Some studies in Cameroon, Ghana and Nigeria assessed the knowledge of HCWs on MTCT of HBV and HCV and showed some gaps in the knowledge of HCWs.^{8, 11, 12} In this study we assessed the knowledge of HCWs on MTCT as a route for transmission of HBV and HCV. More females (51.7%) compared to males participated in this study. This is similar to the study among HCWs in Ghana.¹¹ We found that only a quarter of the HCWs knew MTCT as a route of HBV transmission. This is far lower when compared to findings in similar studies in Cameroon, Iran, and Ethiopia.^{8,14,15} We also found that a little above one-quarter of the HCWs in this study knew about MTCT as a route of HCV transmission, and this finding is also far lower than the findings in Iran and Ethiopia.^{14,15}

Furthermore, this study showed that most of the HCWs had poor knowledge on MTCT of HBV and HCV. The poor level of knowledge in this study when compared to other studies as cited above may be because this study was conducted in a secondary healthcare facility while the other studies were in tertiary healthcare facilities, as HCWs in the tertiary healthcare facilities have more exposures compared to those in the secondary healthcare facility and hence are likely to have better knowledge. In addition, the setting of this study was a rural setting compared to most of the other studies done in urban settings and this may also have contributed to the very low knowledge found in this study. Furthermore, in this study every cadre of HCW involved in providing care for the pregnant women was included as compared

to the other studies where only skilled and other trained HCWs were studied.

Table 3- Factors associated with knowledge on MTCT of HBV and HCV

Variables	Level of knowledge		χ^2	P-value
	Good Freq. (%)	Poor Freq. (%)		
Sex				
Male	12 (38.7)	19 (61.3)	3.34	0.07
Female	10 (40.0)	40 (80.0)		
Age				
16-25	5 (22.7)	17 (77.3)	2.50	0.64
26-35	6 (21.4)	22 (78.6)		
36-45	5 (29.4)	12 (70.6)		
46-55	4 (44.4)	5 (55.6)		
56-65	2 (40.0)	3 (60.0)		
Cadre				
Doctor	4 (80.0)	1 (40.0)	13.30	0.01
CHEW/JCHEW	5 (26.7)	25 (83.3)		
Laboratory Technician	5 (50.0)	5 (50.0)		
Nurse/Midwife	3 (25.0)	9 (75.0)		
Pharmacist	3 (42.9)	4 (57.1)		
Attendants	2 (11.8)	15 (88.2)		
Years of experience				
< 6	13	33	4.37	0.36
6-10	5	7		
11- 15	3	6		
16-20	0	2		
> 20	1	11		

HCWs are expected to be knowledgeable in order to pass the same information to the pregnant women so they can take necessary precautions to prevent viral hepatitis considering its effect on the pregnancy and also the foetus.⁶ So, this poor knowledge on MTCT of HBV and HCV among the HCWs is a big challenge to the prevention and control of the infection.

Again, this study found an association between knowledge of the HCWs and their cadre. This corroborated the findings of studies done among HCWs in Cameroon and Nigeria.^{8,16} This may be because higher skilled HCWs are expected to have more knowledge compared to less skilled and unskilled HCWs as a result of the content on the training.

The limitation of the study includes the fact that reported findings are limited to the validity of self-reporting but in order to reduce this, the participants

were reassured of the confidentiality of the information they provided. However, lower cadre HCWs being included in this study, since they are involved in providing some level of care in ANC especially in Low and Medium Income Countries with inadequate human resources for health, is a strength of this study.

Conclusions

The knowledge of HCW on MTCT transmission of viral hepatitis is poor. We recommend that HCWs should be trained to be knowledgeable on the transmission of viral hepatitis by MTCT through continuing medical education in order to pass the required information to women attending ANC for the control of viral hepatitis.

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