

## KNOWLEDGE AND ATTITUDE ABOUT HEPATITIS B VIRUS AND ITS TRANSMISSION FROM MOTHER TO CHILD AMONG A SAMPLE OF PREGNANT WOMEN ATTENDING THE PRIMARY HEALTH CARE CENTERS IN BAGHDAD, IRAQ

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### ABSTRACT

**Introduction:** Hepatitis B virus (HBV) is one of the most common viruses in the modern world and ranked by the WHO as one of the top ten killers. The virus is responsible for approximately 1.5 million deaths worldwide each year, two thirds of which are attributable to primary hepatic carcinoma following HBV infection. **Objective:** To assess the knowledge and attitudes towards hepatitis B and its transmission from mother to child among pregnant women attending the primary health center. **Subjects and methods:** A cross sectional study was carried for the period from 1<sup>st</sup> of Sep. /2018 – 15<sup>th</sup> of Nov. /2018, at ten primary health centers at Baghdad. A convenient sampling technique was conducted to choose the primary health centers; pregnant women 15-49 years old were included, pregnant women who refuse to participate or

those who attending the health center as a second visit and more were excluded. A questionnaire was self-administered via face-to-face interviews. The questionnaire consisted of 26 items, divided into three parts: demographic information, knowledge of HBV, and attitudes about HBV. **Results:** The proportion who agreed to participate was high (93%). The most common age groups were (25-29) years old and (20-24) years old, (27.5%) and (26.5%)

respectively. More than half of the women were housewives 144 (72%). more than half of the pregnant did not know that hepatitis B is caused by a virus 161 (80.5%).105 (52.5%) did not know that HBV can be transmitted through the use of unsafe needles, sharps, doing tattoo or during dentist visit and nearly (81.0%) did not know that HBV can be transmitted from mother to infant. 123 (61.5%) of the respondent agreed that the person with HBV should always be isolated to prevent HB infection to others. **Conclusion:** Pregnant women had insufficient general knowledge regarding HBV infection and their conception regarding mode of transmission, vaccination and prevention of MTCT were poor. Despite more respondent being aware of the importance of antenatal screening, neonatal vaccination and postnatal follow up of HBV; their attitude towards infected person were poor.

**KEYWORDS:** Knowledge, attitude, hepatitis B virus, pregnant women.

## INTRODUCTION

Hepatitis B is an inflammatory process of the liver caused by a viral infection that is found worldwide. The World Health Organization (WHO) estimated that in 2015 about 240 million people were chronic carriers of hepatitis B virus (HBV).<sup>[1]</sup>

The severity of this affection is by its possible progression to late complications like liver cirrhosis and primitive liver cancer. HBV is a communicable disease whose mode of transmissions are well known; by blood and blood products, sexual transmission and vertical transmission from mother-to-child. Vertical transmission has been identified to be one of the causes of the high prevalence of HBV infection in Sub-Sahara Africa.<sup>[2,3]</sup> The decreased rate, especially among people under 20 years may be attributed to the successful coverage of children with HB immunization as part of childhood vaccination.<sup>[4]</sup>

Hepatitis B virus (HBV) infection remains a serious global public health problem. Globally, there are an estimated 240 million people chronically infected with HBV, with more than 686,000 deaths annually due to complications of hepatitis B, including cirrhosis and hepatocellular carcinoma.<sup>[5]</sup>

Acute infection of HBV can cause nonspecific symptoms or fulminant hepatitis that may cause death or require urgent liver transplantation. Chronic infection can be the cause of death associated with liver failure, cirrhosis, or hepatocellular carcinoma. Furthermore, after cigarette smoking, HBV ranks second on the list of known carcinogenic agents that affect

humans.<sup>[6-9]</sup> By adhering to universal precautions which include using protective barriers such as gloves, vaccination, appropriate sterilization of medical equipment, and a suitable hospital waste management system, the spread of HBV infection can be prevented.<sup>[10-13]</sup>

Mother-to-child-transmission(MTCT) is the major mode of HBV transmission worldwide, which is a problematic since around 90% of infected infants progress to chronic hepatitis B. This risk is much higher than from horizontal transmission where the rate of chronicity is 30–50% when infected before 6 years of age and <5% when infected in adulthood.<sup>[5,14,15]</sup>

Despite improved childhood HBV vaccination worldwide, MTCT still accounts for about 50% of new HBV infections in high endemic countries and one-third in low endemic countries.<sup>[16-19]</sup>

Therefore, preventing MTCT is crucial for decreasing HBV prevalence. Prevention requires HBV-infected mothers to be aware of their disease status and to understand the consequences of HBV transmission to their child. Although, many studies have demonstrated that insufficient knowledge of HBV infection in the general public.<sup>[20-25]</sup> and among health care workers<sup>[26-28]</sup> is associated with high prevalence of hepatitis B, only a few studies have assessed knowledge of hepatitis B and MTCT among pregnant women.<sup>[29-31]</sup> These studies also indicated similar gaps of knowledge; however, they did not assess the attitudes of the mothers towards methods of preventing MTCT of hepatitis B. Their attitudes could affect their willingness for prenatal screening and to follow the current WHO immune prophylaxis guidelines, which include birth dose vaccine, hepatitis B immunoglobulin for their infants, and completing HBV vaccine series prior to 1 year of age.<sup>[32]</sup> Therefore, this study addresses that gap by assessing attitudes towards screening and towards various interventions to prevent MTCT of HBV. Assessment of the knowledge and attitude on HBV in pregnant women is crucial. Identification of knowledge gaps and misconceptions will help in the development of educational interventions to fill these gaps. Therefore, this study was undertaken to measure the knowledge and to identify attitude towards hepatitis B, together with identifying the demographic variables associated with the level of knowledge about the disease.

#### **AIM OF STUDY**

To assess the knowledge and attitudes towards hepatitis B and its transmission from mother to child among pregnant women attending the primary health center.

## METHODOLOGY

**Study design, setting:** A cross sectional study was carried out at ten primary health care centers belongs to Al-Rusafa Health Directorate (New-Baghdad sector, Al-Rusafa sector, Al-Ademiyah sector and Al-Baledyate First sector) in Baghdad from the 1<sup>st</sup> of September 2018 to the 15<sup>th</sup> of November 2018. Questionnaire based study was done on 200 pregnant women out of 215 (response rate 93%) who attended the primary health care center.

**Ethical consideration:** The study has been approved by the scientific and ethical committees for research at Al-Rusafa Health Directorate. Aims of the study were explained to all participants and verbal consent was taken from each participant before being enrolled in the study. The women who met the inclusion criteria and accepted to participate in the study was interviewed, items of the form were explained to the participants and filled in by the researcher.

**Definition of cases, inclusion and exclusion criteria:** All the pregnant women (age range 15-49), attending the health center as their first antenatal visit were included, pregnant women who refuse to participate or those who attending the health center as a second visit and more were excluded from the study. Two hundred pregnant women had fulfilled the inclusion criteria.

**Sampling technique:** A convenient sampling technique was conducted to choose the primary health care centers.

**Data collection procedure:** The sample size was 215 pregnant women attending the PHCC as their first antenatal visit, distributed between the primary health care centers, it was a convenient sample. The data collection was done through direct interview with each woman for about 15 minutes. The non-response rate was 7%, so the remaining will be 200 participants. The participant rate was 93%.

**Questionnaire:** The questionnaire was self-administered. The questionnaire was administered via face-to-face interviews. This method was chosen because many women were not well educated so may have had difficulty finishing the questionnaire without assistance. The interviews were conducted by the researcher or by a trained paramedical staff who was working in the antenatal care unit that was in the PHCC. The questionnaire was jointly developed by the study team in English and then translated into Arabic. Pre-testing in

pregnant women indicated that the questions were easy to understand, we test the reliability of the study by conducting a pilot study, initially 10 pregnant women we interviewed and asked to fill the questionnaire to test it and to ensure clarity of the questionnaire. The 10 pregnant women were not included in the study sample. The study questions and the characteristics of participants were based on previous survey and article with similar objectives.<sup>[33]</sup> For validating the questionnaire, specific experts in gastroenterologists, community and family medicine, confirmed the introduction and validity contents of the primary questionnaire. Some questions were omitted according to their advice. The questionnaire consisted of 26 items, divided into three parts: demographic information, knowledge of HBV, and attitudes about HBV. The demographic information included age, self-reported HBV infection status, number of children, stage of trimester, occupation and education level. The knowledge section tested three aspects: 1) general knowledge of HBV (4 items: Q1, Q7, Q8, Q9); 2) modes of transmission (5 items: Q2, Q3, Q4, Q5, Q6); and 3) knowledge of vaccine and MTCT of HBV (5 items: Q10, Q11, Q12, Q13, Q14). For each item there were three response options: 'yes', 'no', and 'don't know'. The attitude section consisted of 6 items (Q15, Q16, Q17, Q18, Q19, Q20) and was mainly about prevention of MTCT of HBV and follow-up after birth. For each item there were three response options: 'agree', 'disagree', and 'don't know'.

**Statistical analysis:** The statistical analysis of the study was performed with the statistical package for social sciences (SPSS) 23. Categorical data formulated as number and percentage, numerical data with normal distribution were described as mean and standard deviation.

## RESULT

Socio-demographic characteristics of the pregnant women:-of the 215 pregnant women who invited to participate, 200 agreed and answered the questionnaire, the proportion who agreed to participate was high (93%). The study participant's ages range from 15-49 years. The mean  $\pm$  SD is (27.94 $\pm$ 6.76). The most common age groups were (25-29) years old and (20-24) years old, 55 (27.5%) and 53 (26.5%) respectively. More than half of the women were housewives 144 (72%) while 56(28%) of the respondent attained an education level of university or higher. The majority of the women were pregnant at their 2<sup>nd</sup> trimester 109 (54.5%), few of them were pregnant with their first baby 29 (14.5%) as shown in table 1 and 2.

**Knowledge about HBV:** Table 3 illustrates frequency distribution of pregnant knowledge about hepatitis B infection. Regarding the general knowledge questions (Q1, Q7, Q8, Q9), more than half of the pregnant did not know that hepatitis B is caused by a virus 161 (80.5%), 151 (75.5%) of them did not know that hepatitis B infection can lead to liver cancer, while 128 (64%) of them did not know that hepatitis B infection can lead to liver cirrhosis. 37 (18.5%) of the pregnant women said that the infection with HBV could be asymptomatic. Regarding the various mode of transmission (Q2, Q3, Q4, Q5, Q6), only 7 (3.5%) knew that HBV can be transmitted through blood, 159 (79.5%) of the respondent did not know that HBV can be transmitted through unprotected intercourse, more than half of them 105 (52.5%) did not know that HBV can be transmitted through the use of unsafe needles, sharps, doing tattoo or during dentist visit and nearly 162 (81.0%) did not know that HBV can be transmitted from mother to infant. Furthermore 179 (89.5%) said that HBV could not be co-transmitted with HIV. Regarding knowledge vaccine and MTCT of HBV questions (Q10, Q11, Q12, Q13, Q14), the majority of the participants 173 (86.5%) knew that a hepatitis vaccine was available, 125 (62.5%) of them did not know that receiving less than three doses of hepatitis B vaccine does not give protection against HBV infection. Only 9 (4.5%) of the pregnant women knew that their baby should receive HB immunoglobulin and 46 (23.0%) knew that they should take drugs that are known not to harm the developing baby in pregnancy to prevent transmitting HBV to their baby, if they got HBV infection. Only 10 (5.0%) were aware that MCTC of HBV could eventually lead to severe liver complication in either in childhood or as adulthood.

**Attitude towards HBV:** Of the respondent, a total of 173 (86.5%), 180 (90.0%) were willing to be screened for HBV during antenatal care and let their baby receive HBV vaccine, respectively. 46 (23.0%) of them were willing to get pregnant, if they got HBV infection. Moreover, if they were diagnosed with HBV, only 43 (21.5%) of them agreed to let their doctor and their husbands know and tell their husband that they should receive HB vaccine, while 193 (96.5%) of the pregnant agreed to let their baby HBV testing during the baby's first year. 123 (61.5%) of the respondent agreed that the person with HBV should always be isolated to prevent HB infection to others as shown in table 4.

**Table 1: Distribution of pregnant women according to socio-demographic characteristic.**

Demographic variables		Number	Percent%
Age(year)	15-19	12	6.0
	20-24	53	26.5
	25-29	55	27.5
	30-34	43	21.5
	35-39	25	12.5
	40-44	12	6.0
	45-49	0	0
Occupation	Student	4	2.0
	Employed	52	26
	Housewife	144	72
Educational level	Illiterate	16	8.0
	Primary school	91	45.5
	Secondary school	37	18.5
	University and higher	56	28.0
<b>Total</b>		200	100

**Table 2:- Distribution of pregnant women according to obstetric variables.**

Obstetric variables		Number	Percent%
Gravidity	Primigravida	29	14.5
	Multigravida	171	85.5
Trimester	1 <sup>st</sup> trimester	57	28.5
	2 <sup>nd</sup> trimester	109	54.5
	3 <sup>rd</sup> trimester	34	17.0
<b>Total</b>		200	100

**Table 3: Distribution of pregnant women according to their knowledge about hepatitis B.**

Knowledge variable		No.	Percent%
Q1: Hepatitis B is caused by a virus	Yes	27	13.5
	No	12	6.0
	Do not know	161	80.5
Q2: Hepatitis B can be transmitted through blood transfusion	Yes	7	3.5
	No	20	10.0
	Do not know	173	86.5
Q3: Hepatitis B can be transmitted through unprotected sexual intercourse	Yes	11	5.5
	No	30	15.0
	Do not know	159	79.5
Q4: Hepatitis B can be transmitted from mother to fetus	Yes	22	11.0
	No	16	8.0
	Do not know	162	81.0

	know		
Q5: Hepatitis B can be transmitted through use of unsafe needles, sharps, tattoo or dentist visit	Yes	15	7.5
	No	80	40.0
	Do not know	105	52.5
Q6: An individual can be infected by both Hepatitis B and HIV	Yes	9	4.5
	No	179	89.5
	Do not know	12	6.0
Q7: Hepatitis B infection can lead to liver cancer	Yes	16	8.0
	No	33	16.5
	Do not know	151	75.5
Q8: Hepatitis B infection can lead to cirrhosis (scarred liver)	Yes	18	9.0
	No	54	27.0
	Do not know	128	64.0
Q9: A person can be infected with hepatitis B and not have any symptoms of the disease	Yes	37	18.5
	No	110	55.0
	Do not know	53	26.5
Q10: There is a vaccine for hepatitis B	Yes	173	86.5
	No	21	10.5
	Do not know	6	3.0
Q11: If you got HBV infection, do you know that your baby should receive anti- HBV antibodies (immunoglobulin)?	Yes	9	4.5
	No	168	84.5
	Do not know	23	11.5
Q12: If you got HBV infection, do you know that you should take drugs that are known not to harm the developing baby in pregnancy to prevent transmitting HBV to your baby?	Yes	46	23.0
	No	125	62.5
	Do not know	29	14.5
Q13: vaccination of less than three doses does not give protection against hepatitis B?	Yes	50	25.0
	No	25	12.5
	Do not know	125	62.5
Q14: Babies that are infected perinatally (at or around the time of delivery) are at high risk for eventual complications of liver fibrosis, cirrhosis or liver cancer	Yes	10	5.0
	No	90	45.0
	Do not know	100	50.0
Total	200	100	

**Table 4:- Distribution of pregnant women according to their attitude towards hepatitis B virus.**

Attitude variable		No.	Percent%
Q15: Are you willing to be screened for hepatitis B during an antenatal care visit (blood test)?	Agree	173	86.5
	Disagree	12	6.0
	Do not know	15	7.5
Q16: Are you willing to let your baby receive HBV vaccine?	Agree	180	90.0
	Disagree	7	3.5
	Do not know	13	6.5
Q17: Are you willing to get pregnant if you make sure that you have got hepatitis B?	Agree	46	23.0
	Disagree	29	14.5
	Do not know	125	62.5
Q18: If you got hepatitis B, are you willing to let your doctor and your husband know and tell your husband that he should receive hepatitis B vaccine?	Agree	43	21.5
	Disagree	92	46.0
	Do not know	65	32.5
Q19: Are you willing to take your baby back to the clinic to test his/her HBV status a few times during the 1st year after birth?	Agree	193	96.5
	Disagree	3	1.5
	Do not know	4	2.0
Q20: The person with HBV should always be isolated from other people to prevent infection?	Agree	123	61.5
	Disagree	16	8.0
	Do not know	61	30.5
Total		200	100

## DISSCUSION

Hepatitis B (HB) is a serious global public health problem which affects liver and caused by hepatitis B virus (HBV). It is contagious and easy to be transmitted from one infected individual to another by blood to blood contact, mother to child, unprotected sexualintercourse, and other barber shop and beauty salon equipment.<sup>[34]</sup> Hepatitis B virus infections are rapidly spreading in the developing countries including Iraq due to the lack of health education, poverty, illiteracy and lack of hepatitis B vaccination sometimes. The high prevalence of HBV infection among women of childbearing age places a significant number of infants and newborns at risk of vertical transmission. This burden may remain heavy; especially when the infection is not detected antenatally or during childbirth when prophylactic vaccination or administration of immunoglobulin can take place.<sup>[35]</sup> HBV infection kills about 1.1million people globally every year. However, incidence of HBV infection could be brought down by giving proper education regarding its transmission and universalimmunization of infants with hepatitis B vaccine.<sup>[36]</sup>

Our study was carried out on 200 pregnant women; a 26 item questionnaire was distributed. It was conducted on pregnant women attending the primary health centers. In our study, we

found that the predominant age groups (26.5% and 27.5% of the respondent) were 20-24 and 25-29 years respectively, which are within the reproductive age bracket and this emphasizes the need for preventive measures in all women of childbearing age. Expectant mothers' knowledge of HBV infection is very critical in eliminating the transmission cycle of the virus in newborns. In contrast, majority of the respondents in this study had some formal education of primary level and yet their knowledge was generally low. Generally, the study revealed a relatively insufficient knowledge about HBV which may be a barrier to eliminating MTCT since a minority of women correctly answered all the general HBV knowledge questions or all the questions about HBV transmission, our reported proportions regarding answering the knowledge questions correctly is lower than that reported previously in Erbil city, Iraq which reported high proportion of the medical student had poor knowledge regarding HBV (41%)<sup>[37]</sup> and similar to a study conducted in Sudan reported inadequate general knowledge (69.1%)<sup>[38]</sup> In our study more than half of the respondent (80%) did not know that HB is a virus, only (8.0 %) knew that HBV can lead to liver cancer, (9.0 %) knew that HBV can lead to liver cirrhosis and (18.5%) knew that a person can be infected with HBV and does not have any symptoms, this is consistent with a study done on a trained health care workers in China, showed low knowledge about the seriousness of HBV as asymptomatic, its risk of liver cirrhosis, liver cancer and death<sup>[39]</sup>, and lower than a study done in Mumbai, only 14% of the women knew that HBV can cause liver cirrhosis and 30% knew that HBV can cause liver cancer.<sup>[40]</sup> In a study conducted in Erbil city, Iraq 64.5% of the respondent knew that HBV can cause cancer.<sup>[37]</sup> A study was done in Iran among adolescent, reported that 38.1% knew that HBV can cause liver cancer.<sup>[41]</sup> In our study the computation of general knowledge of the pregnant women gave an overall estimate rather than scoring each question. The general knowledge of the pregnant women was approximately in line with the level of knowledge among Cambodian Americans<sup>[42]</sup>, but much lower than the knowledge of hairdressers.<sup>[43]</sup> The medical and other health and non-health students showed various low levels of knowledge about HBV<sup>[44-49]</sup>, this wide variation may be due to the type of sampling method used, size of screened population, the variation of geographical location and age group included in these studies. Our study result is inconsistent with that was done in China which revealed that 56.5 % knew that HB is a virus, 57.5% knew that HBV can lead to liver cancer and 58.8% knew that HBV can lead to liver cirrhosis<sup>[33]</sup>, also inconsistent with a study that was done in Ghana 90.8% knew that HB is a virus.<sup>[50]</sup> In a study done in Saudi Arabia (71.5%) of the respondent knew that HB is a viral disease, this high level of knowledge may be due to that the study was done among internet users, so they may gain their information through the internet, but only

(48.8%) knew that HB can cause liver cancer which stills higher than our reported result.<sup>[51]</sup>, also inconsistent with a study done among medical student in Saudi Arabia 75.5% of the student knew that HBV can cause liver cancer<sup>[52]</sup> as expected, the level of prior knowledge and information about the disease among the medical students due to that they gained their information from the curricula. In addition, they have more chances to come across different medical resources and obtain more information during dealing with patients.

Regarding mode of transmission (3.5%, 5.5%, 11.0% and 7.5%) of the respondent knew that HBV could be transmitted through blood transfusion, unprotected sex, from mother to fetus and the use of unsafe needles, sharps, tattoo or during dentist visits respectively. In a study done regarding the knowledge about hepatitis B infection among undergraduate medical and Health College students in Baghdad, Iraq. knowledge responses of the students were in general disappointing regarding mode of transmission 43% of the respondent knew that HBV can be transmitted from mother to fetus, 39.2% by sexual transmission, contaminated needles and contact with contaminated surfaces, 21.4% of students knew correctly that HBV can be transmitted through blood transfusion, 24.2% by tattooing and 43% knew correctly that HBV can be perinatal transmitted, but stills higher than our result.<sup>[53]</sup> Our result consistent with that done in Pakistan, very few women knew that HBV can spread through sexual intercourse and contact with infected blood product through transfusion, sharing of needles and unsafe injecting equipment.<sup>[54]</sup> In a study done in Mumbai, there was more correct knowledge about some modes of transmission than our study, only one fifth of women knew about sexual contact as mode of transmission, and the same proportion knew that infant could acquire HBV from infected mothers during child birth, while more than half of them knew that HBV can be transmitted through blood transfusion but, only 6% knew that HBV can be transmitted through the use of unsafe needles and the same proportion for tattooing.<sup>[40]</sup> Similarly a population based knowledge, attitude, beliefs and practices study in France, indicated a low level of knowledge on the mode of transmission of HBV through sex contact or using unsafe needles.<sup>[55]</sup> The low knowledge documented in our study is similar to the finding of Adeyemi et al and Mkandawire et al in Nigeria and Ghana respectively.<sup>[56,57]</sup> Our result regarding mode of transmission was much lower than that reported in Erbil city, Iraq (56.5%, 71.5%, 80.0%) of the medical student knew that HBV can be transmitted through sexual contact, infected needles and blood transfusion respectively<sup>[37]</sup>, much lower than that reported in Saudi Arabia (66.8%, 47.0%, 52.1% and 47.6%) of the internet users knew that HB can be transmitted by unsterilized needles, contaminated blood, unsafe sex and from mother to child

respectively<sup>[51]</sup>, alsomuch lower than that reported in China which revealed that (74.6%, 46.7%, 80.6% and 71.1%) of the pregnant women knew that HBV can be transmitted through blood transfusion, unprotected sex, from mother to fetus and through the use of unsafe needles or sharps.<sup>[33]</sup> and also lower than that reported among medical student in Saudi Arabia, (96.5%, 92.5% and 79.5%) of the student knew that HBV can be transmitted by contaminated blood, unsterilized syringe and needle and by unsafe sex respectively. This high rate of knowledge regarding mode of transmission among medical student due to that they gained their information from the curricula and they have more chances to get access to different medical resources.<sup>[52]</sup> A study was conducted in Iran reported that (59.1%, 70.1% and 55.3%) of the respondent knew that HBV can be transmitted from spouse, by blood transfusion and by tattooing respectively.<sup>[21]</sup> This variation of the reported proportions could be attributed to several factors. These may include the definition of the study population or the level of education, college and above, though more likely have greater access to information from various sources including mass media, health websites, and educational pamphlets.

Furthermore, despite the fact that HBV vaccine was fully integrated into the expanded routine immunization program and freely available to all infant, 86.5% of oursurvey participants were aware that the HBV vaccine were routinely available in Iraq, our study result goes in line with a study conducted among medical student in Saudi Arabia (86.5%).<sup>[52]</sup> Our rate is lower than a previous study done in Iraq, which revealed that 100% of the medical and 91.6% of the paramedical staff knew that there was an effective vaccine for HBV, this can be explained by the fact that physicians and paramedics had more training years and continuous medical education activities in the postgraduate years, there fore they had wider knowledge,<sup>[58]</sup> also our result is much lower when compared with 95% immigrant Asian Americans who understand that HBV is preventable by vaccination<sup>[59,60]</sup>, But more higher than that reported in Erbil city, Iraq (64%) of medical student knew that there was a vaccine for HBV<sup>[37]</sup>, also higher when compared with China (74.7%) of the participants were aware that the HBV vaccine was routinely available in China.<sup>[33]</sup> and higher than that reported in Saudi Arabia, (59.3%) of the respondent knew that there is a vaccine for HB, this low proportion may be due to that the study population was done among internet users, not pregnant women which made them less aware about the routine vaccine that was available or may be most of them single not married or the male ratio more than the female or most of them uneducated all these factors may influence the knowledge regarding HBV vaccine

availability.<sup>[51]</sup> This finding suggests that there is an obligation to address the inconsistency by establishing better health education on universal safety precautions for the prevention of infections. This lack of knowledge may influence the attitudes of the mothers towards interventions that could reduce the risk of transmission to their infants.

Generally, the respondent had positive attitudes on screening, baby testing for HBV and receiving vaccine. Despite WHO recommendations for universal immunization against HBV infection by all countries the policy has been implemented in Iraq, but still now coverage is low. It may be due to lack of awareness about the beneficial effect of hepatitis B vaccination. So, there is a paper recommendation for introducing Hepatitis B Vaccination awareness through the public electronic media. Only less than half of them were willing to get pregnant if they got the disease, because they have beliefs that the disease might affect the baby. Some of them refuse to let their doctor or their husband know if they got HBV infection and some had beliefs that the infected person should be isolated. These negative attitudes may be linked to the low level of satisfactory knowledge in general and specifically to the poor knowledge at the domain of disease transmission and prevention.

## CONCLUSION

1. Pregnant women had insufficient general knowledge regarding HBV infection and their conception regarding mode of transmission, vaccination and prevention of MTCT were poor.
2. Despite more respondent being aware of the importance of antenatal screening, neonatal vaccination and postnatal follow up of HBV, their attitude towards infected person were poor.

## RECOMMENDATION

Public education on hepatitis B is imperative. Health education can be provided through different educational platforms, which can achieve through public health campaigns focusing on less educated people. In addition, several health educational message can delivered through social media in a form of videos or posters that educate the people on the most common signs and symptoms, route of transmission and treatment. Hepatitis B patients can provide health education on the disease by conveying their experience to others. Health care providers should be educated in depth about the disease and trained to be a reliable source of information to the public. Continuous education for the parent and public to get vaccination and medical screening. Early screening particularly for people who at high risk is important.

The education can be provided in the well-distributed primary health care centers in the study area. Additional efforts to enhance HBV public health education programs in understandable language are needed to achieve the goal of eliminating MTCT of HBV. Future studies could be aimed towards determining the impact of such education programs.

## REFERENCES

1. WHO Bulletin 2015. Guidelines for the prevention, care and treatment of persons with chronic hepatitis B infection. Accessed 12 December 2015.
2. WHO Bulletin 2010. Hépatitis B Virus. Accessed on 12 December 2015.
3. Goldstein ST, Zhou F, Hadler SC, Bell BP, Mast EE, Margolis HS. A mathematical model to estimate global hepatitis B disease burden and vaccination impact. *Int J Epidemiol*, Dec, 2005; 34(6): 1329-1339.
4. Ageely H, Mahfouz M, Gaffar A, Elmakki E, Elhassan I, et al. Prevalence and Risk Factors of Hepatitis B Virus in Jazan Region, Saudi Arabia: Cross-Sectional Health Facility Based Study *Health*, 2015; 7: 459-465.
5. World Health Organization. Hepatitis B Fact sheet. Updated July 2016. <http://www.who.int/mediacentre/factsheets/fs204/en/>.
6. Schillie S, Murphy TV, Sawyer M, Ly K, Hughes E, Jiles R, et al. CDC guidance for evaluating health-care personnel for hepatitis B virus protection and for administering post exposure management. *MMWR Recomm Rep.*, 2013; 62: 1-9.
7. Abedi F, Madani H, Asadi A, Nejatizadeh A. Significance of blood-related high-risk behaviors and horizontal transmission of hepatitis B virus in Iran. *Arch Virol*, 2011; 156: 629-35.
8. Wilkins T, Zimmerman D, Schade RR. Hepatitis B: Diagnosis and treatment. *Am Fam Physician*, 2010; 81: 965-72.
9. Causse X, Delaunet A, Si Ahmed SN. Anaes practice guidelines for vaccination against hepatitis B virus: Impact on general practitioners. *Gastroenterol Clin Biol.*, 2009; 33: 1166-70.
10. Rachiotis G, Goritsas C, Alikakou V, Ferti A, Roumeliotou A. Vaccination against hepatitis B virus in workers of a general hospital in Athens. *Med Lav.*, 2005; 96(1): 80-6.
11. Molinari J. Infection control. Its evolution to the current standard precautions. *J Am Dent Assoc*, 2003; 134(5): 569-74.

12. World Health Organization. Health Care Worker Safety. Available from: [http://www.who.int/occupational\\_health/activities/1am\\_hcw.pdf](http://www.who.int/occupational_health/activities/1am_hcw.pdf).
13. Hutin Y, Hauri A, Chiarello L, Catlin M, Stilwell B, Ghebrehiwet T, et al. Best infection control practices for intradermal, subcutaneous, and intramuscular needle injections. *Bull World Health Organ*, 2003; 7: 491–500.
14. Gambarin-Gelwan M. Hepatitis B in pregnancy. *Clinics in Liver Disease*, 2007; 11: 945–963.
15. Lai CL, Ratziu V, Yuen MF, Poynard T. Viral hepatitis B. *Lancet*, 2003; 362: 2089–2094.
16. Xu Y, Liu H, Wang Y, Hao R, Li Z, Song H. The next step in controlling HBV in China. *BMJ*, July 16, 2013; 347: f4503.
17. Giles ML, Grace R, Tai A, Michalak K, Walker SP. Prevention of mother-to-child transmission of hepatitis B virus (HBV) during pregnancy and the puerperium: current standards of care. *Aust N Z J Obstet Gynaecol*, June, 2013; 53(3): 231–235.
18. Vodkin I, Patton H. Management of Hepatitis B virus infection during pregnancy. *Minerva Gastroenterol Dietol*, December, 2014; 60(4): 205–214.
19. Thio CL, Guo N, Xie C, Nelson KE, Ehrhardt S. Global elimination of mother-to-child transmission of hepatitis B: revisiting the current strategy. *Lancet Infect Dis.*, August, 2015; 15(8): 981–5.
20. Chung PW, Suen SH, Chan OK, Lao TH, Leung TY. Awareness and knowledge of hepatitis B infection and prevention and the use of hepatitis B vaccination in the Hong Kong adult Chinese population. *Chin Med J (Engl)*, February, 2012; 125(3): 422–7.
21. Roushan N, NasiriToosi M, Meysamie A, Esteghamati AR, Hajrassuliha H. Hepatitis B knowledge among Iranian adolescents: a national survey. *Iran Red Crescent Med J.*, December, 2013; 15(12): e11558.
22. Cotler SJ, Cotler S, Xie H, Luc BJ, Layden TJ, Wong SS. Characterizing hepatitis B stigma in Chinese immigrants. *J Viral Hepat*, February, 2012; 19(2): 147–152.
23. Zheng J, Li Q, Wang J, Zhang G, Wangen KR. Inequality in the hepatitis B awareness level in rural residents from 7 provinces in China. *Hum Vaccin Immun other*, February, 2017; 14: 1–9.
24. Mohamed R, Ng CJ, Tong WT, Abidin SZ, Wong LP, Low WY. Knowledge, attitudes and practices among people with chronic hepatitis B attending a hepatology clinic in Malaysia: a cross sectional study. *BMC Public Health*, August 3, 2012; 12: 601.

25. Huang J, Guan ML, Balch J, Wu E, Rao H, Lin A, Wei L, Lok AS. Survey of hepatitis B knowledge and stigma among chronically infected patients and uninfected persons in Beijing, China. *Liver Int.*, November, 2016; 36(11): 1595–1603.
26. Hu Y, Dai X, Zhou YH, Yang H. A knowledge survey of obstetrics and gynecology staff on the prevention of mother-to-child transmission of hepatitis B virus. *J Infect Dev Ctries*, May 13, 2013; 7(5): 391–7.
27. Al-Hazmi AH. Knowledge, attitudes and practice of primary health care physicians towards hepatitis B virus in Al-Jouf province, Saudi Arabia. *BMC Res Notes*, May 9, 2014; 7: 288.
28. Adjei CA, Asamoah R, Atibila F, Ti-Enkawol GN, Ansah-Nyarko M. Mother-to-child transmission of hepatitis B: extent of knowledge of physicians and midwives in Eastern region of Ghana. *BMC Public Health*, July 11, 2016; 16: 537.
29. Chan OK, Lao TT, Suen SS, Lau TK, Leung TY. Knowledge on hepatitis B infection among pregnant women in a high endemicity area. *Patient Educ Couns*, December, 2011; 85(3): 516–20.
30. Chan OK, Lao TT, Suen SS, Leung TY. Deficient knowledge on hepatitis B infection in pregnant women and prevalence of hepatitis B surface antigen carriage in an endemic area: a review. *Hepat Res Treat.*, 2012; 2012: 317451.
31. Adeyemi AB, Enabor OO, Ugwu IA, Bello FA, Olayemi OO. Knowledge of hepatitis B virus infection, access to screening and vaccination among pregnant women in Ibadan, Nigeria. *J Obstet Gynaecol*, February, 2013; 33(2): 155–9.
32. World Health Organization. Guidelines for the prevention, care and treatment of persons with chronic hepatitis B infection March., 2015; WC-536.
33. Han Z, Yin Y, Zhang Y, Ehrhardt S, Thio CL, Nelson KE, et al. Knowledge of and attitudes towards hepatitis B and its transmission from mother to child among pregnant women in Guangdong Province, China. *PLoS ONE*, 2017; 12(6): e0178671.
34. Faiza Hamid Jyoti. Assessment of knowledge and attitude of Hepatitis B among Secondary School and College Students in Bangladesh, 2013.
35. Jonas MM. Hepatitis B and pregnancy: An underestimated issue. *Liver International*, 2009; 29: 133–139.
36. Ray SK. Vaccine preventable diseases. In. Chaturvedi S, Jena TK eds. *Epidemiology in maternal and childhealth, Preventive medicine*. New Delhi., 2003; 40-66.
37. Othman SM, Saleh AM, Shabila NP. Knowledge about hepatitis B infection among medical students in Erbil city, Iraq. *Eur Sci J.*, 2013; 3(Special edition): 299-305.

38. Elsheikh TAE, Swait YMOA, Balla SA, Abdalla AA, and Bashir AA. Knowledge, Attitude and Practice of Village Midwives Regarding Hepatitis B Virus in Khartoum State, Sudan- 2014. *J EpidPrev Med.*, 2017; 3(1): 126.
39. Samuel SO, Aderibigbe SA, Salami TAT, Babatunde OA. Health Workers Knowledge, attitude and Behavioral towards Hepatitis B Infection in Southern Nigeria. *International Journal of Medicine and Medical Sciences*, 2009; 1(10): 418-424.
40. Jha S, Devaliya D, Bergson S, Desai S. Hepatitis B knowledge among women of childbearing age in three slums in Mumbai: a cross-sectional survey. *Hepatol Med Policy*, 2016; 1: 5.
41. Roushan N, Nasiri Toosi M, Meysamie A, Esteghamati AR, Hajrassuliha H. Hepatitis B knowledge among Iranian adolescents: a national survey. *Iran Red Crescent Med J.*, 2013; 15(12): e11558.
42. Chao J, Chang ET and Samuel KS So. Hepatitis B and Liver Cancer Knowledge and Practices among Health care and Public Health Professionals in China: A Cross-Sectional Study. *BMC public health*, 2010; 10: 98.
43. Taylor MV, Talbot J, DoH H, Liu Q, Yasui YJ Carey Jackson CJ, et al. Hepatitis B Knowledge and Practices among Cambodian Americans. *Asian Pac J Cancer Prev.*, 2011; 12(4): 957–961.
44. Baig VN, Gupta PK, Sharma AK, Swarnkar M. Assessment of Knowledge, Attitude and Practice About Hepatitis B Among Clinicians & Medical Students: A Cross Sectional Study. *National Journal of Community Medicine*, 2015; 6(2): 415-422.
45. Khan N, Ahmed MA, Khalid MM, Siddiqui HS and Merchant AA. Effect of Gender and Age on The Knowledge, Attitude and Practice Regarding Hepatitis B and C and Vaccination Status of Hepatitis B Among Medical Students of Karachi, Pakistan. *J Pak Med Assoc*, 2010; 60(6): 450-455.
46. Nagpal B, Usha H. Knowledge, Attitude and Practices of Hepatitis B Infection among Dental Students. *International Journal of Medical Science and Public Health*, 2016; 5(6): 112-27.
47. Abdela A, Woldu B, Haile K, Mathewos B, Deressa T. Assessment of Knowledge, Attitudes and Practices Toward Prevention of Hepatitis B Virus Infection Among Students of Medicine and Health Sciences in Northwest Ethiopia. *BMC Res Notes*, 2016; 9: 410.

48. Mesfin MY, Kibret TK. Assessment of Knowledge and Practice towards Hepatitis B among Medical and Health Science Students in Haramaya University, Ethiopia. *PLOS one*, 2013; 8(11): e79642.
49. Salem M, Al Shazaly H, Salama A, Elseidy AA. Knowledge and Attitudes Regarding Hepatitis Viruses among Secondary-School Students in Menoufia Governorate. *Menoufia Medical Journal*, 2015; 28(2): 415-419.
50. Adjei CA, Asamoah R, Atibila F, Ti-Enkawol GN, Ansah-Nyarko M. Mother-to-child transmission of hepatitis B: extent of knowledge of physicians and midwives in Eastern region of Ghana. *BMC Public Health*, 2016; 16: 537.
51. Elbur AI, Almalki N, Alghamdi A, Alqarni Alqarni HA Knowledge, Attitude and Practice on Hepatitis B: A Survey among the Internet Users in Taif, Kingdom of Saudi Arabia. *J Infect Dis Epidemiol*, 2017; 3: 036.
52. Alhowaish MA, Alhowaish JA, Alanazi YH, et al. Knowledge, attitudes and practices toward prevention of hepatitis B virus infection among medical students at Northern Border University, Arar, Kingdom of Saudi Arabia. *Electron Physician*, 2017; 9(9): 5388-5394.
53. Maral F Thabit, Mohammed H. Ali and Nazar M AL-Bahadeli. Knowledge about Hepatitis B Infection among Undergraduate Medical and Health College Students, Baghdad. *Mustansiriya Medical Journal*, 2017; 16(2): 63-67.
54. Nadia Noreen, Renuka Kumar and Babar Tasneem Shaikh. Knowledge about hepatitis B vaccination among women of childbearing age: a cross-sectional study from a rural district of Punjab, Pakistan. *Eastern Mediterranean health journal*, 2015; 21(2): 129-33.
55. Brouard C, Gautier A, Saboni L, et al. Hepatitis B knowledge, perceptions and practices in the French general population: the room for improvement. *BMC public health*, 2013; 13: 576.
56. Adeyemi AB, Enabor, OO, Ugwu, I.A, Bello, F.A, Olayemi, O.O. Knowledge of hepatitis B virus infection, access to screening and vaccination among pregnant women in Ibadan, Nigeria. *Journal of obstetrics and gynaecology*, 2013; 33(2): 155-9.
57. Mkandawire P, Richmond C, Dixon J, Luginaah IN, Tobias J. Hepatitis B in Ghana's upper west region: a hidden epidemic in need of national policy attention. *Health & place*, 2013; 23: 89-96.
58. Noaman AM, Ahmed AE, Alanee SA. KAP study about hepatitis B among medical and paramedical staff in Tikrit City. *Tikrit Med J.*, 2012; 18(2): 261-8.

59. Cotler SJ, Cotler S, Xie H, Luc BJ, Layden TJ, Wong SS. Characterizing hepatitis B stigma in Chinese immigrants. *J Viral Hepat*, Feb, 2012; 19(2): 147–152.
60. Dam L, Cheng A, Tran P, Wong SS, Hershow R, Cotler S, Cotler SJ. Hepatitis B Stigma and Knowledge among Vietnamese in Ho Chi Minh City and Chicago. *Can J Gastroenterol Hepatol*, 2016; 2016: 1910292.