# Assessment of the knowledge, attitude and practice of pregnant women towards hepatitis B infection seen at a tertiary hospital in the Philippines

By Maria Angelica B. Arada, MD and Stella Marie L. Jose, MD, MHPEd, FPOGS, FPIDSOG
Department of Obstetrics and Gynecology, Philippine General Hospital, University of the Philippines-Manila

**ABSTRACT**

**Background:** Multiple studies have described the insufficiency in knowledge, attitude and practices of the general population and of healthcare workers towards HBV infection across different countries.

**Objective:** This study aims to assess the knowledge level and correlate it with the attitude and practices of pregnant women towards Hepatitis B infection.

**Methodology:** This is a descriptive study on pregnant women consulting for their first antenatal visit in the outpatient department of a tertiary hospital. A structured self-administered questionnaire, adapted from a study by Han et al, was reviewed and modified by infectious disease experts, and then validated prior to use. 164 pregnant patients, aged 18-45 years old, were recruited. Logistic regression analysis was used to correlate attitude and practice to knowledge scores.

**Results:** Most participants (48.78%) belonged to the 18-25 year old age group. Only 7.32% of the participants answered all knowledge questions correctly while 39.02% answered at least 2/3 of the questions correctly. Knowledge scores were not associated with patient demographic information but were correlated with their attitude and practices towards Hepatitis B infection.

**Conclusion:** A lack of knowledge regarding Hepatitis B infection exists among pregnant patients. Government and private institutions must invest time and effort to bridge this knowledge gap. Health promotion should be directed towards the pregnant population since vertical transmission remains to be the most common route of transmission in our country.

*Keywords: Hepatitis B, HBV, Pregnancy, Knowledge, Attitude and Practices*

## INTRODUCTION AND SIGNIFICANCE OF THE STUDY

Hepatitis B virus (HBV) is a serious health concern worldwide. When left undetected and untreated, acute acquisition of the virus could progress to a chronic form of the disease, which may lead to more serious complications, including liver cirrhosis and hepatocellular carcinoma.[1] Although the highest prevalence of HBV has been found in the sub-Saharan and East Asian areas, it remains to be of growing concern in the Philippines. According to the Hepatology Society of the Philippines, as of 2014, hepatitis B affects up to 350 million people globally and 7.3 million adults in the Philippines (16.7% of the adult Filipino population). This prevalence is twice as much as the 8% average prevalence of hepatitis B in the Western Pacific region.[2]

Transmission may occur through both horizontal and vertical routes. In the Philippines, mother-to-child transmission (MTCT) remains to be the leading cause of spread.[2] This further emphasizes the need to intervene as early as having the patient still in the pregnant state. Children have a 70-90% chance of acquiring the virus through perinatal transmission from mothers who report positive for HBsAg and HBeAg—with 85-90% of them becoming chronic carriers of the disease.[2] Thus, preventing MTCT is essential in reducing the burden of the disease.

In the Philippines, part of the efforts of the government to address the issue on the growing prevalence of hepatitis B infection in the country includes the implementation of the Mandatory Infant Health Immunization Act of 2010. This bill requires routine vaccination for hepatitis B among all infants within 24 hours of life regardless of their mother's status on having the virus. It also includes the obligation of health practitioners to duly inform parents and guardians of the infants of the availability and benefits of the immunization. Furthermore, the World Association of Perinatal Medicine, of which the Philippine Obstetrical and Gynecological Society is a part of, requires routine screening for HbsAg of all pregnant patients during their first antenatal visit. If mothers are tested positive, further work up is done i.e. HBeAg determination and Anti HBc IgG and IgM shall be taken.[2] Unfortunately, according to the World Health Organization, current estimates in the

Philippines indicate that only 50% of newborns are being given the recommended vaccine within 24 hours from birth.

The natural course of chronic Hepatitis B is divided into four phases, based on the virus- host transmission: immune tolerance, immune clearance, low or non-replication, and reactivation. For the immunotolerant phase, hepatitis B e antigen is present and there are high levels of HBV-DNA, which pertains to the viral load. The serum alanine aminotransferase (ALT) remains normal or minimally elevated. The liver is still normal or has minimal histological activity and scant fibrosis. In those infected perinatally, it may persist for 10 to 30 years. In those acquiring the infection during childhood or adulthood, it may be short-lived or absent.[3]

The second phase is the immune clearance phase, during which the individual's immune system mounts an attack against infected hepatocytes. This phase is characterized by unsteady and progressively decreasing HBV-DNA levels, elevated ALT and hepatic necroinflammation.[3]

The third phase is the low or non-replication phase or the inactive hepatitis B antigen carrier state. During this phase, HBeAg is found to be negative whereas anti-HBe is positive. HBV-DNA is low or undetected, ALT is normal, and liver histology is inactive or shows minimal fibrosis.[3] Individuals who are inactive carriers, or asymptomatic carriers of the hepatitis B antigen comprise the largest proportion of patients chronically infected with the virus. The prognosis is usually benign with long term follow up studies showing very low risk of complications and disease progression. Exceptions have been found among rare cases who still developed hepatocellular carcinoma even during the inactive carrier state.[4]

The last phase is the reactivation phase which may occur with reactivation of the virus and reversion back to HBsAg positivity or may be due to the replication of competent HBV variants that prevented HBeAg expression. During this phase, HBeAg is found to be negative while anti-HBe is positive. HBV-DNA levels are detectable, ALT is elevated, moderate or severe inflammation of the liver with variable amounts of fibrosis is present.[5] Multiple episodes of reactivation or sustained reactivation could lead to cirrhosis and hepatic decompensation.[4]

Despite the routine screening for Hepatitis B during the prenatal period and the mandatory hepatitis B vaccination specified for infants upon birth, not all mothers comply and the prevalence of the disease continues to rise. Financial constraints may partly explain this poor compliance, but a person's knowledge and attitude towards the disease may likewise contribute significantly. In the Philippine law, vaccinations, if given in a public health facility, shall be fully subsidized by the government; if administered in a private facility, it will be shouldered by the parents or infants of the newborn.

Multiple studies have described the insufficiency in knowledge, attitude and practices of the general population and of healthcare workers towards HBV infection across different countries. Only a few studies have assessed the knowledge and attitude among the pregnant population. Sufficient knowledge on HBV may affect the attitude of pregnant women when it comes to their willingness for screening for HBV infection during pregnancy and their willingness to proceed with corresponding interventions. When pregnant mothers are given the proper education and exercise the proper attitude, appropriate and timely management of the disease may be applied. In the long-term, transmission and complications of HBV may be prevented and the burden of the disease may be reduced.

## OBJECTIVES OF THE STUDY

The general objective of this study is to assess the level of knowledge, attitude and practices of pregnant women towards Hepatitis B infection who consulted for antenatal care at a tertiary hospital in the Philippines.

The specific objectives of this study include the following:

- To describe the socio-demographic characteristics of pregnant women consulting for antenatal care at a tertiary hospital in the Philippines
- To determine the knowledge of pregnant women towards hepatitis B infection
- To determine the attitude of women towards hepatitis B infection
- To determine the practice of women towards hepatitis B vaccination and immunoprophylaxis.
- To correlate knowledge of hepatitis B infection to the attitude towards the infection among pregnant women.
- To correlate knowledge to the practice of vaccination and immunoprophylaxis
- To identify potential barriers to the knowledge of pregnant patients to Hepatitis B in pregnancy

### Operational Definition of Terms

1. Pregnancy - the state of carrying a fetus in a woman's womb regardless of age of gestation, documented by either a positive serum or urine pregnancy test or by ultrasonography
2. Hepatitis B Virus - it is the agent which causes the hepatitis B infection. It can be an acute (new onset) or chronic infection (past infection). The serologic

markers of this infection are the following 6:

a. Hepatitis B surface antigen (HBsAg) and the corresponding antibody anti-HBs to indicate presence of the virus and antibodies to the virus
b. Hepatitis B envelope antigen (HBeAg) and the corresponding antibody anti-HBe which describe degree of infectivity
c. Immunoglobulin M antibody to hepatitis B core antigen (IgM anti-HBc) to indicate acute infection
d. Immunoglobulin G antibody to hepatitis B core antigen (IgG anti-HBc) to indicate chronic infection
e. Serum Hepatitis B Virus DNA (HBV DNA) pertaining to the viral load

3. Knowledge - awareness on Hepatitis B in pregnancy gained through experience or association
4. Attitude - a feeling or emotion with regards to Hepatitis B in pregnancy that affects one's behavior towards it
5. Practice - current behavior with regards to Hepatitis B in pregnancy

## MATERIALS AND METHODOLOGY

### *Study Design*

This is a descriptive study on the knowledge, attitude, and practices on chronic hepatitis B in pregnancy among pregnant women consulting for antenatal care at the Philippine General Hospital—the largest tertiary hospital in the Philippines. The outpatient department of the Department of Obstetrics and Gynecology in this hospital renders antenatal care to patients with diverse socioeconomic backgrounds and medical comorbidities. There are no restrictions on the type of patient they render care to, for as long as the patient is seeking consult for antenatal care. A total of 164 patients were recruited in this study, all of whom satisfied the inclusion and exclusion criteria listed below:

### *Inclusion Criteria*

- Pregnant women of any age of gestation
- Pregnant women consulting for their first antenatal visit at the Philippine General Hospital
- Pregnant women from 18 to 45 years old
- Pregnant patients with or without other medical or surgical conditions.

### *Exclusion Criteria*

- Without informed consent/assent
- Patients who are already on their follow up visit at the Philippine General Hospital
- Patients who are consulting for either ectopic pregnancy or miscarriage
- Patients who are already known cases of Hepatitis B and have sought consult for this condition already.

A minimum sample size of 134 subjects was required for this study based on a level of significance of 5%, a prevalence of 9.6 %, 95% confidence interval, as noted from the study by Carpio et al., 2015. The sample size formula used was:

$$n = \frac{Z^2 P (1-P)}{d^2}$$

$$n = \frac{1.96^2 \, 0.096 (1 - 0.096)}{0.05^2}$$

$$n = 134$$

**Legend:**

n – minimum sample size
p – prevalence of HbsAg seropositivity among pregnant women seeking prenatal consult at Philippine General Hospital
Z – value from standard normal distribution corresponding to 95% confidence interval
d – desired precision (half of confidence interval width) = 0.05

### *Questionnaire*

A structured and validated self-administered questionnaire was used in conducting a survey among the patients recruited in this study. This questionnaire was technically and ethically reviewed and approved by the University of the Philippines Manila Research Ethics Board (UPMREB). It was administered by the principal investigator with the help of the research assistant. An informed consent was signed by all patients prior to participation in this study.

Since there is no standardized questionnaire available on the knowledge, attitude and practices towards Hepatitis B infection in pregnancy, the survey tool adapted as main basis for the questionnaire was from a published article by Han et al in June 2017. In this article, a survey was conducted among pregnant women analyzing only the knowledge and attitude towards hepatitis B in pregnancy and its transmission from mother to child among pregnant women in Guangdong Province, China.[1] Questions on practices towards hepatitis B infection in pregnancy were synthesized to include relevant questions applicable to the local setting. The questionnaire was reviewed, modified, and approved by two experts from the section of Infectious Diseases in the University of the Philippines - Philippine General Hospital.

The questionnaire was made available in both

English and Filipino versions. It was comprised of four portions. The first portion gathered information on patient demographics while the second, third and fourth portions gathered information with the use of 10 questions each concerning the knowledge, attitude and practices of pregnant mothers towards hepatitis B infection in pregnancy respectively. Each question was answered with "yes", "no" or "I don't know". It was first pilot-tested among ten (10) patients consulting for antenatal visit at the Philippine General Hospital outpatient department and each one was asked regarding each item in the tool: *Was there any difficulty understanding this question? What does this question mean to you?* All patients claimed there was no difficulty understanding any of the questions. There was however one comment saying that the first question under "Part IV: Hepatitis B Virus practice related questions" was not applicable for everyone. Though no modifications were necessary for the questionnaire, the succeeding participants were advised from the start of the study that should they participate, they may opt not to answer the aforementioned question number if it did not apply to them.

The questionnaire was then administered to a new set of ten (10) participants, also consulting for their first antenatal visit at the Philippine General Hospital outpatient department, and then re-administered within 3 days from the initial date of administration. The intraclass correlation coefficient or the kappa statistic between the test and retest results for interval/ratio or nominal variables was calculated. This was computed based on the patient's agreement in understanding and consistency of responses between the two sets of questionnaires. This statistic is calculated with the aid of the SPSS software. Once validated, it was then administered to qualified participants for the study.

### *Data Analysis*

Data was extracted from all answered questionnaires conducted and then tabulated in a Microsoft Excel file. An overview of the study population and pertinent sociodemographic variables were described through the use of mean, median and mode. Association between the respondents' sociodemographic characteristics and their knowledge, attitude and practices towards hepatitis B infection in pregnancy was made and analyzed using logistic regression analysis.

## RESULTS

During the initial administration and re-administration of the questionnaire to ten patients consulting for antenatal visit at the Philippine General Hospital outpatient department, the calculated intraclass correlation coefficient or kappa statistic was 0.99. This implies that there is consistency between the answers of the participants with the two sets of questionnaires.

A total of 164 patients were recruited in this study. The following results show the demographic information of all the respondents and their answers to the questions on knowledge, attitude, and practices related to Hepatitis B infection.

### *Characteristics of Study Participants*

Each participant was asked their age, civil status, highest form of educational attainment, religion, history of previous pregnancies, number of sexual partners in their lifetime, history of their previous babies having Hepatitis B vaccination and history of having received advice regarding Hepatitis B from another institution or from a previous antenatal visit. The full demographic information of all participants is summarized in Table 1.

Most of the participants belonged to the age group of 18-25 years old (mean age of 22) (48.78%), were college undergraduates (27%) and disclosed having only one sexual partner throughout their lifetime (67.07%). Most were pregnant with their first pregnancies (53.66%). Only 16.46% had previous babies who received Hepatitis B vaccination. Only 19.51% of the respondents had received previous advice on Hepatitis B virus from another institution or a previous antenatal visit.

### *Respondents' Knowledge Towards Hepatitis B Infection*

The mean knowledge score was 5.61 out of the 10 questions. Only 10.37% of the respondents got all answers correctly. 39.02% answered more than half the questions correctly while 43.29% answered less than half correctly. A small percentage (7.32%) answered all questions incorrectly. This is summarized in Table 2.

For the questions concerning general knowledge (Q1, Q6, Q7, Q8, Q9, Q10), more than half answered correctly in knowing that Hepatitis B is caused by a virus, that it can lead to liver cirrhosis and liver cancer, and that a vaccine is available. However, less than half were aware that an individual can be affected by both Hepatitis B and HIV virus and that one can be asymptomatic even if she has Hepatitis B infection.

For the questions concerning knowledge on the transmission of the virus (Q2, Q3, Q4, Q5), majority were aware that it may be transmitted through blood transfusion, through perinatal route and through the use of unsafe needles or sharps. Less than half were aware that it may be sexually transmitted. The results are listed in Table 3.

**Table 1.** Patient Demographic Information (N = 164)

| | Mean | Number of Patients | Percentage |
|---|---|---|---|
| **Age** | | | |
| 18 - 25 years old | 22.44 | 80 | 48.78% |
| 26 - 35 years old | 30.03 | 59 | 35.98% |
| 36 - 45 years old | 38.44 | 25 | 15.24% |
| **Civil Status** | | | |
| Single | | 53 | 32.32% |
| Married | | 109 | 66.46% |
| Separated | | 2 | 1.22% |
| Widow | | - | 0.00% |
| **Highest Educational Attainment** | | | |
| Elementary school | | 6 | 3.66% |
| High school under graduate | | 23 | 14.02% |
| High school graduate | | 41 | 25.00% |
| College undergraduate | | 45 | 27.44% |
| College graduate | | 36 | 21.95% |
| Vocational course graduate | | 12 | 7.32% |
| Never attended school | | - | 0.00% |
| No information provided | | 1 | 0.61% |
| **Religion** | | | |
| Roman Catholic | | 142 | 86.59% |
| Christian | | 13 | 7.93% |
| Muslim | | 1 | 0.61% |
| Iglesia ni Cristo | | 3 | 1.83% |
| Evangelical | | - | 0.00% |
| Others | | 5 | 3.05% |
| **History of Previous Pregnancies** | | | |
| None | | 88 | 53.66% |
| Previous full term live birth | | 62 | 37.80% |
| Previous preterm live birth | | 6 | 3.66% |
| Previous miscarriage | | 7 | 4.27% |
| Previous stillbirth | | 1 | 0.61% |
| Previous ectopic pregnancy | | - | 0.00% |
| **Total number of lifetime sexual partners** | | | |
| One | | 110 | 67.07% |
| Two | | 37 | 22.56% |
| Three or more | | 17 | 10.37% |
| **History of previous baby with Hepatitis B virus vaccination** | | | |
| Yes | | 27 | 16.46% |
| No | | 137 | 83.54% |
| **Received previous advice on Hepatitis B Virus from another institution or previous antenatal visit** | | | |
| Yes | | 32 | 19.51% |
| No | | 132 | 80.49% |

**Table 2.** Basic Knowledge on Hepatitis B infection (N = 164)

| | Number of Patients | Percentage |
|---|---|---|
| Answered all correctly | 17 | 10.37% |
| Answered 1/3 correctly | 71 | 43.29% |
| Answered 2/3 correctly | 64 | 39.02% |
| Answered all incorrectly | 12 | 7.32% |

**Table 3.** Respondents' Knowledge Towards Hepatitis B infection (N=164)

| | n (%) | | | |
|---|---|---|---|---|
| **Hepatitis B Virus Knowledge related questions** | **Yes** | **No** | **I Don't Know** | **Total Correct Answers** |
| Q1. Hepatitis B is caused by a virus. | 114 (70%) | 22 (13%) | 28 (17%) | 114 (70%) |
| Q2. Hepatitis B can be transmitted through blood transfusion. | 112 (68%) | 23 (14%) | 29 (18%) | 112 (68%) |
| Q3. Hepatitis B can be transmitted through sexual intercourse. | 77 (47%) | 38 (23%) | 49 (30%) | 77 (47%) |
| Q4. Hepatitis B can be transmitted from mother to fetus. | 106 (65%) | 25 (15%) | 33 (20%) | 106 (65%) |
| Q5. Hepatitis B can be transmitted through use of unsafe needles or sharps. | 99 (60%) | 28 (17%) | 37 (23%) | 99 (60%) |
| Q6. An individual can be infected by both Hepatitis B and HIV. | 79 (48%) | 27 (16%) | 58 (35%) | 79 (48%) |
| Q7. Hepatitis B infection can lead to liver cancer and liver cirrhosis (scarred liver). | 85 (52%) | 21 (13%) | 58 (35%) | 85 (52%) |
| Q8. A person can be infected with hepatitis B and not have any symptoms of the disease. | 58 (35%) | 40 (24%) | 66 (40%) | 58 (35%) |
| Q9. There is a vaccine for hepatitis B. | 113 (69%) | 16 (10%) | 35 (21%) | 113 (69%) |
| Q10. 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. | 77 (47%) | 18 (11%) | 69 (42%) | 77 (47%) |

***Respondents' Attitude Towards Hepatitis B Infection***

Of the 164 pregnant participants, only a little more than a third of them (35%) were aware that they could get Hepatitis B, a third (33%) were unsure, and a little less than third (31%) thought they could not get the infection. Majority of the patients were willing to be screened for Hepatitis B during an antenatal care visit (73%), to have their baby vaccinated with Hepatitis B virus vaccine (68%) and to receive anti Hepatitis B virus antibodies (79%).

If theoretically, they were diagnosed with Hepatitis B virus, majority also claimed that they were willing to undergo further tests in finding out their infectivity of the disease (74%), to take medicines during pregnancy in preventing transmission of Hepatitis B virus to their babies (73%), to disclose their condition to their partner (60%), to bring back their babies to the clinic to check the status of their Hepatitis B virus (76%) and to receive subsequent doses of the vaccine (60%). More than half of the respondents (59%) claimed that they will not undergo unprotected sexual intercourse should they have the infection. The specific percentages of the respondent's answers to the questions on attitude towards Hepatitis B infection are summarized in Table 4.

***Respondents' Practices Towards Hepatitis B Infection***

Most patients (58%) have not participated in any health education programs related to hepatitis B. Among the participants with previous pregnancies, 65% had their previous children vaccinated for Hepatitis B while 19% did not. A minority (13%) were unaware on the vaccination status of their previous children.

76% also claimed that in the event that they will undergo blood transfusion, they will have the blood screened for Hepatitis B first. Most do not share personal items with others such as sharp objects, tattoo instruments and toothbrushes (74%) nor will they share food or utensils with others infected with Hepatitis B (68% and 70% respectively). A majority (64%) also claimed that they will not engage in unprotected sexual sex with someone known to have Hepatitis B.

When it comes to non-sexual contact like holding hands with someone with Hepatitis B infection, only 38% said they were willing to do so while an equal percentage of respondents who were not willing. Similarly, only 38% were also not willing to share the same toilet while 36% were willing.

When it comes to pregnancy, a majority (57%) were not willing to breastfeed their babies if they were diagnosed with hepatitis B; only 21% claimed to be willing to breastfeed while 22% were unsure.

***Correlation of Knowledge, Attitude and Practice towards Hepatitis B Infection***

The result of the correlation between the main outcome factors (knowledge, attitude and practice) showed significant association between knowledge and attitude, and knowledge and practice of Hepatitis B infection. Table 6 shows that upon using logistic regression analysis, there was significant association

**Table 4.** Respondents' Attitude Towards Hepatitis B infection (N=164)

| | n (%) | | |
|---|---|---|---|
| **Part III: Hepatitis B Virus Attitude related questions** | **Yes** | **No** | **I Don't Know** |
| Q1. Do you think you can get Hepatitis B? | 58 (35%) | 51 (31%) | 55 (34%) |
| Q2. Are you willing to be screened for Hepatitis B during an antenatal care visit (blood test)? | 120 (73%) | 23 (14%) | 21 (13%) |
| Q3. Are you willing to let your baby receive Hepatitis B virus vaccine? | 112 (68%) | 30 (18%) | 22 (13%) |
| Q4. If you have Hepatitis B Virus infection, are you willing to let your baby receive anti-Hepatitis B Virus antibodies? | 129 (79%) | 20 (12%) | 15 (9%) |
| Q5. If you have Hepatitis B Virus infection, are you willing to undergo further tests to find out your infectivity of the disease? | 121 (74%) | 22 (13%) | 21 (13%) |
| Q6. If you have Hepatitis B Virus infection, are you willing to take medicines that are safe during pregnancy, in order to prevent transmitting Hepatitis B Virus infection to your baby? | 120 (73%) | 20 (12%) | 24 (15%) |
| Q7. If you have Hepatitis B Virus infection, are you willing to engage in unprotected sexual intercourse with a partner who is known to have hepatitis B? | 31 (19%) | 97 (59%) | 36 (22%) |
| Q8. If you have Hepatitis B Virus infection, will you disclose this to your partner? | 99 (60%) | 34 (21%) | 31 (19%) |
| Q9. Are you willing to take your baby back to the clinic to test his/her Hepatitis B virus status a few times during the 1st year after birth? | 124 (76%) | 19 (12%) | 21 (13%) |
| Q10. Are you willing to bring your baby back to the LHC so that he can receive his Hepatitis B vaccination immediately after birth, at 1 month old and at 6 months old? | 132 (80%) | 14 (9%) | 18 (11%) |

**Table 5.** Respondents' Practices Towards Hepatitis B infection (N=164)

| | n (%) | | |
|---|---|---|---|
| **Part IV: Hepatitis B Virus Practice related questions** | **Yes** | **No** | **I Don't Know** |
| Q1. Are all your children vaccinated against Hepatitis B? | 82 (65%) | 24 (19%) | 21 (16%) |
| Q2. If you receive blood transfusion, would you ask if the blood has been screened for hepatitis B? | 125 (76%) | 17 (10%) | 22 (14%) |
| Q3. Do you share personal items (sharp objects, tattoo instruments, toothbrush) with others? | 31 (19%) | 122 (74%) | 11 (7%) |
| Q4. In case you are diagnosed with Hepatitis B, would you avoid non-sexual contact like holding hands, with Hepatitis B infected patients? | 63 (38%) | 63 (38%) | 38 (24%) |
| Q5. Would you share food (ex. take a bite from an already bitten sandwich or biscuit or take a part from a common serving platter of food) with a Hepatitis B infected person? | 33 (20%) | 111 (68%) | 20 (12%) |
| Q6. Would you avoid sharing the toilet with a Hepatitis B infected person? | 59 (36%) | 62 (38%) | 43 (26%) |
| Q7. Would you engage in unprotected sexual intercourse with a person infected with hepatitis B? | 21 (13%) | 105 (64%) | 38 (23%) |
| Q8. Have you ever participated in health education programs related to hepatitis B? | 50 (30%) | 95 (58%) | 19 (12%) |
| Q9. In case you were diagnosed with Hepatitis B infection, would you share your utensils (like spoon and fork) with your family? | 33 (20%) | 115 (70%) | 16 (10%) |
| Q10. In case you were diagnosed with Hepatitis B infection, would you breastfeed your baby? | 34 (21%) | 94 (57%) | 36 (22%) |

(p value <0.05) between knowledge scores and the attitude question numbers 2 to 9, with the highest association being the one with the attitude on willingness to undergo further tests to find out infectivity of the disease (question number 5). Similarly, logistic regression analysis also showed significant association between knowledge scores and practice questions concerning (1) having blood screened for Hepatitis B prior to transfusion, (2) avoiding non-sexual contact like holding hands with Hepatitis B infected patients, (3) participating in health education programs and (4) sharing utensils with family (Table 7).

**Table 6.** Logistic Regression Analysis of Knowledge Scores Associated with Attitude

| Part III: Hepatitis B Virus Attitude related questions | Odds Ratio | 95% CI | p-value |
|---|---|---|---|
| Q1. Do you think you can get Hepatitis B? | 1.7 | 0.89 to 3.25 | 0.1115 |
| Q2. Are you willing to be screened for Hepatitis B during an antenatal care visit (blood test)? | 2.3 | 1.14 to 4.66 | 0.0210 |
| Q3. Are you willing to let your baby receive Hepatitis B virus vaccine? | 2.2 | 1.13 to 4.31 | 0.0213 |
| Q4. If you have Hepatitis B Virus infection, are you willing to let your baby receive anti-Hepatitis B Virus antibodies? | 5.51 | 2.32 to 13.07 | 0.0001 |
| Q5. If you have Hepatitis B Virus infection, are you willing to undergo further tests to find out your infectivity of the disease? | 5.09 | 2.34 to 11.13 | <0.0001 |
| Q6. If you have Hepatitis B Virus infection, are you willing to take medicines that are safe during pregnancy, in order to prevent transmitting Hepatitis B Virus infection to your baby? | 2.62 | 1.28 to 5.37 | 0.0081 |
| Q7. If you have Hepatitis B Virus infection, are you willing to engage in unprotected sexual intercourse with a partner who is known to have hepatitis B? | 2.48 | 1.06 to 5.81 | 0.0354 |
| Q8. If you have Hepatitis B Virus infection, will you disclose this to your partner? | 3.12 | 1.63 to 5.99 | 0.0006 |
| Q9. Are you willing to take your baby back to the clinic to test his/her Hepatitis B Virus status a few times during the 1st year after birth? | 2.39 | 1.15 to 4.95 | 0.0201 |
| Q10. Are you willing to bring your baby back to the LHC so that he can receive his Hepatitis B vaccination immediately after birth, at 1 month old and at 6 months old? | 1.92 | 0.88 to 4.22 | 0.1026 |

**Table 7.** Logistic Regression Analysis of Knowledge Scores Associated with Attitude

| Part IV: Hepatitis B Virus Practice related questions | Odds Ratio | 95% CI | p-value |
|---|---|---|---|
| Q1. Are all your children vaccinated against Hepatitis B? | 1.34 | 0.73 to 2.48 | 0.3479 |
| Q2. If you receive blood transfusion, would you ask if the blood has been screened for hepatitis B? | 6.89 | 2.92 to 16.28 | <0.0001 |
| Q3. Do you share personal items (sharp objects, tattoo instruments, toothbrush) with others? | 1.74 | 0.77 to 3.9 | 0.1813 |
| Q4. In case you are diagnosed with Hepatitis B, would you avoid non-sexual contact like holding hands, with Hepatitis B infected patients? | 2.39 | 1.25 to 4.62 | 0.0090 |
| Q5. Would you share food (ex. take a bite from an already bitten sandwich or biscuit or take a part from a common serving platter of food) with a Hepatitis B infected person? | 1.22 | 0.57 to 2.64 | 0.6139 |
| Q6. Would you avoid sharing the toilet with a Hepatitis B infected person? | 1.60 | 0.84 to 3.06 | 0.1578 |
| Q7. Would you engage in unprotected sexual intercourse with a person infected with hepatitis B? | 0.76 | 0.3 to 1.9 | 0.5531 |
| Q8. Have you ever participated in health education programs related to hepatitis B? | 2.36 | 1.17 to 4.76 | 0.0160 |
| Q9. In case you were diagnosed with Hepatitis B infection, would you share your utensils (like spoon and fork) with your family? | 2.34 | 1.03 to 5.31 | 0.0420 |
| Q10. In case you were diagnosed with Hepatitis B infection, would you breastfeed your baby? | 1.30 | 0.61 to 2.8 | 0.4982 |

## DISCUSSION

### *The Burden of Disease*

Chronic hepatitis B is a public health threat which may cause considerable liver-related morbidity and mortality. Gish et al identified that contributing to the high seroprevalence of HBsAg in the Philippines is the inadequacy of vaccination for prevention and the lack of treatment for the disease. Both health care practitioners and the general public lack understanding of the risks and the long term consequences of infection left untreated and the importance of screening.[5]

An increasing prevalence in the Philippines has been found not only among high-risk populations, but also in the general population. The largest study to date done last 2013 reported an HBsAg seroprevalence of 16.7% among 2,150 Filipino adults participating in the National Nutrition and Health Survey.[4] This corresponds to an estimate of 7.3 million Adult Filipinos with chronic hepatitis B. A study conducted by Carpio et al. last 2015 described a prevalence of 9.6% HBsAg positivity. This corresponded to 69 patients out of a total of 650 pregnant women consulting at the outpatient clinic of the Philippine General Hospital Department of OB-GYN included in the study, covering the period of January to July 2014. This was greater compared to prior reports dated in 1996, where HBsAg prevalence was only 5-8% in the same hospital.

In addition to determining prevalence, risk factors must also be identified for the purpose of designing future preventive measures. Risk factors for hepatitis B in pregnancy vary depending on the population. In one study in 2014, Frambo et al described a Nigerian population and noted that some of the major risk factors contributing to a higher HBsAg prevalence were: higher mean parity, greater number of sexual partners since mean sexual debut, polygamy, and history of previous sexually transmitted infection.[6] In a 2015 study in the Philippines, risk factors in a population of pregnant patients in a tertiary hospital included older age, multiple pregnancies, history of spontaneous abortion. [2]

### *Hepatitis B infection and pregnancy*

During pregnancy, the maternal changes in immune activity can increase HBV viremia and can also affect the natural course of hepatitis B. 6-14% of women report hepatic flares during pregnancy, and 10-50% report flares postpartum. Hepatic flares are defined as a two to threefold increase of the alanine aminotransferase (ALT) which is at least three to five times above normal. Most of the flares are mild and self-limited, in the absence of advanced fibrosis.[4] Predictors of hepatic flares during pregnancy have not been established but they have been found to be more common among hepatitis B e antigen positive mothers.[4] Decompensation can also occur during severe hepatic flares. The immunologic changes during pregnancy tend to worsen or unmask underlying liver disease but progression to liver cirrhosis is not expected within such a short time.

Hepatitis B may manifest at the very early stages of the disease. It must be emphasized that many cases are diagnosed despite being asymptomatic. When hepatitis B goes undetected, an ongoing infection may delay diagnosis of a related liver disease and may favor further spread of the virus. Screening is then important for those in high and low risk populations, and for those with and without symptoms. When the infection is acquired earlier in life, like the neonate, there is a higher chance of progression to chronic disease—up to 90% if acquired perinatally and 20-30% during childhood, when the immune system is not yet fully developed.[3] Transmission may occur horizontally among individuals engaging in sexual behavior, those using contaminated injectable devices, recipient of blood transfusion, or it may occur vertically via mother to child transmission.[5] In the Philippines, the most common route is maternal-to-child transmission.[2] Because of the global burden of the disease, importance must be placed especially on women of reproductive age and how to educate them on the disease and its prevention.

### *Knowledge towards Hepatitis B Virus*

This study demonstrated that among patients in the Philippine General Hospital outpatient department, there was a lack of sufficient knowledge on Hepatitis B virus during pregnancy. This lack in knowledge is a potential barrier in the prevention, treatment and control of the infection and its sequelae. Although 43% of the patients were able to answer most of the questions on knowledge, only about 10% of all participants answered all the knowledge questions correctly. Seeing that we were dealing with pregnant patients, it is of particular concern that majority were not aware that the virus may be transmitted sexually and perinatally. Majority were also unaware that one can be infected with hepatitis B virus and not manifest any symptoms. These results are similar to a study done in China by Han et al in 2017 wherein most of the pregnant patients included in the study were also unaware that it is often asymptomatic and that it may be transmitted through unprotected sexual intercourse. According to this same study, such data appears to be consistent not just in China but also among pregnant patients in Hong Kong and other high endemic areas.

Hepatitis B may be transmitted through infected bodily fluids (transfusion of infected blood and blood products, sharing of contaminated personal items such as razors and toothbrushes, unsanitary body modification like tattooing or body piercing, reuse of contaminated medical equipment, and needle sharing), through sexual transmission and through vertical transmission from mother to infant.[8] In countries with high prevalence, perinatal transmission was deemed the major mode of transmission while low prevalence countries were mostly due to horizontal transmission.[9] Knowing the different modes of transmission is essential in formulating preventive measures for the disease.

The knowledge scores of the patients in this study were not found to be associated with any of the demographic variables of the participants. However, it was found to have positive correlation with their attitude and their practices.

***Association of Knowledge towards Hepatitis B Virus with Patient attitude***

When it comes to the pregnancy, knowledge of hepatitis B was associated with their attitude on willingness to be screened for hepatitis B during their antenatal visit, to have their babies vaccinated with Hepatitis B vaccine regardless of the status of their Hepatitis B infection, to bring back their babies to the health center for monitoring of status of the infection and to take medications during their pregnancy to prevent transmission to their babies. Fortunately, in the Philippines, it is mandated by the Expanded Program on Immunization that children have access to routinely recommended vaccines. If people are willing to have their children vaccinated, then this program must be implemented strictly. Vaccinations and information should be made readily accessible.

When it comes to sexual contact, knowledge of hepatitis B in pregnancy was associated with their attitude on willingness to disclose their condition to their partner and to engage in unprotected sex with someone else with Hepatitis B virus. This again emphasizes the importance of having sufficient knowledge as these will have an impact on prevention strategies later on. Specific barriers to information dissemination must be identified and addressed.

***Association of Knowledge towards Hepatitis B Virus and Patient practice***

The results of this study also demonstrate the association of knowledge on Hepatitis B in pregnancy with several factors pertaining to their practice. For one, it was associated with their willingness to participate in health education programs related to Hepatitis B. This may pose a challenge in spreading information. Strategies must be employed so that health education programs become appealing, accessible and effective for everyone.

Knowledge on hepatitis B virus was also found to be associated with other patient related practices such as having blood screened for Hepatitis B prior to blood transfusion, of avoiding non-sexual contact when diagnosed with Hepatitis B and of sharing utensils with family for those diagnosed with Hepatitis B.

There was poor association with knowledge and the practice in breastfeeding babies should they be diagnosed with Hepatitis B during pregnancy. Most of the participants answered that they will not breastfeed. This answer was regardless of whether they knew about the effects and impact of Hepatitis B virus on pregnancy. It is a practice however that should be changed because breastfeeding provides superior benefits for infants. Current World Health Organization recommendations are to allow breastfeeding as there is no evidence for additional risk, even if no immunization has been given.[10]

## CONCLUSION

Hepatitis B in pregnancy remains to be a growing and important health concern in the Philippines. The existing lack of knowledge among pregnant patients seen in this study should be addressed by both public and private health sectors. Having sufficient knowledge on Hepatitis B is generally associated with a positive attitude and acceptable practice as seen in this study. Prevention strategies should them be developed and strictly implemented. The use of barrier methods of family planning like the male and female condoms, can prevent the spread of Hepatitis B through sexual intercourse route of transmission. Health awareness campaigns like those of HIV day, Breastfeeding week celebration, or Senate Bill Act No. 2029 “Liver Cancer and Hepatitis B Awareness Month” could also be a start. Health education programs, health care services, trainer personnel must be maximized to eliminate potential barriers to the prevention of the disease. Existing immunization programs and republic acts, such as the Expanded Immunization Program, Republic Act No. 7846 (Compulsory Hepatitis B Immunization Among Infants and Children Less than 8 years old) and the Mandatory Infants and Children Health Immunization Act of 2011, must be strictly implemented and routinely strengthened.

Furthermore, routine screening for Hepatitis B in pregnancy should include determining positivity of HBsAg and anti-HBs titers. Healthcare workers who are

also at high risk of being exposed to blood or bodily fluids while on the job should likewise have routine screening and vaccination for Hepatitis B.

In highly endemic countries like the Philippines where the most common route of transmission of Hepatitis B is through MTCT, health promotion and prevention strategies should be directed towards the pregnant population. Further studies should identify specific barriers to health education and prevention programs in the population at study, to determine the impact of already existing programs and how they can be improved and maximized. ■

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