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Hepatitis B Knowledge, Screening, and Vaccination among Hmong Americans

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Abstract

We examined Hmong women and men's knowledge of hepatitis B and their screening and vaccination behavior. In-depth interviews were conducted with Hmong in Oregon aged 18 and older (n=83). Independent samples t-test was used to assess mean differences in knowledge by demographic characteristics. Qualitative data were analyzed using content analysis. Most participants had heard of hepatitis B (96.4%). Fifty-three percent of participants had been screened, and half had been vaccinated (50.6%). Transmission knowledge was significantly higher among younger participants, those born in the U.S., and those who reported seeking preventive care. Sequelae knowledge was significantly higher among those who sought preventive care. Transmission and sequelae knowledge were not associated with screening and vaccination. Qualitative data showed that, of those hepatitis B positive participants, most did not have a comprehensive understanding of their illness. Intervention strategies should address knowledge deficits and improve health literacy, especially among Hmong who have hepatitis B.

Keywords

Hepatitis B; screening; vaccination; Hmong; Asians

Despite national efforts over the past 20 years to eliminate the transmission of hepatitis B infection, one in 10 Asian Americans are chronically infected compared with less than 1% of the general population in the United States (U.S.).^{1,2} Asian Americans account for more than half of the estimated 1.4 to 2 million individuals with chronic hepatitis B in the U.S.,^{3,4} even though they only make up 4.8% of the population.⁵ Studies suggest that the high rate of infection is due to the combination of vertical transmission from mother-to-child at birth, horizontal transmission, and low vaccination rates.⁶⁻⁹ Exposure to hepatitis B at birth and in childhood (aged 1-5 years) often leads to chronic, lifelong infection and premature death.¹⁰⁻¹²

Chronic hepatitis B infection is the foremost risk factor for liver cancer and contributes to 80% of all liver cancer deaths worldwide.^{1,13} The incidence of liver cancer is highest among Asian men, which is nearly three times higher than non-Hispanic white men (21.7 per 100,000 vs. 8.6 per 100,000),¹⁴ and some of the highest rates are among Southeast Asians.¹⁵ Based on Surveillance Epidemiology and End Results (SEER) data for 1998 to 2002, the incidence of liver cancer among Laotian/Hmong men (79.4 per 100,000) was almost 12

times that of non-Hispanic White men (6.1 per 100,000).¹⁵ Laotian/Hmong men also had the lowest liver cancer survival rate and were more likely than other Asian ethnic groups to be diagnosed at later stages of liver cancer with only 3% undergoing any type of medical treatment (i.e., surgery or liver transplant).¹⁶

There is a growing body of literature that addresses hepatitis B infection among Asian Americans; however, very few studies examine the prevalence of hepatitis B in the U.S. Hmong population even though many Hmong emigrated from Southeast Asia where hepatitis B is endemic.¹⁴ To date, we found fewer than 10 publications on the prevalence of hepatitis B among the Hmong.^{9, 17-20} In those studies, hepatitis B infection rates in Hmong ranged from 3.41% and 18%,^{9, 18-20} with most infections occurring among individuals under the age of 40. Reasons for the variation in infection rates may be reflective of regional differences in sample characteristics. One study on hepatitis B prevalence in U.S.-born Hmong children reported that hepatitis B infection increased with age, with the highest prevalence among young adults aged 25-29 years (36%).⁹ A study of Hmong in Minnesota found that 18% were hepatitis B-positive, with most infections in youth aged 15-19 years.¹⁸

Although hepatitis B infection in the Hmong is high, vaccination rates are remarkably low. In a study with Hmong youth (aged 15-25 years), 68% of participants reported having knowledge about hepatitis B vaccination, yet only 12% reported having been vaccinated.¹⁷ In a more recent study, only 11.4% of Hmong participants reported having been vaccinated for hepatitis B infection.²⁰ In comparison, hepatitis B vaccination rates for U.S. adults aged 18-49 years in 2004, the most recent data available, was 34.6%.²¹

The Hmong immigrated to the U.S. from Southeast Asia as refugees in the 1970s and are best known for their role in the Secret War in Laos during the Vietnam conflict.²² There are over 260,000 Hmong living in the U.S., with the largest Hmong communities in California, Minnesota, and Wisconsin.²³ Hmong health beliefs are traditionally centered around natural and spiritual causes, which have been identified as potential barriers to health screenings including screenings for hepatitis B and cancer.²⁴⁻²⁵ For example, bad health is believed to be the result of disharmony of one's spirits or soul loss. Furthermore, Hmong are often diagnosed with cancer in the late stages and have the worst survival rates compared to other Asians in the U.S.¹⁶

Few studies have characterized Hmong women and men's knowledge of hepatitis B infection. The purpose of this study was to explore Hmong women and men's knowledge of hepatitis B and their screening and vaccination behavior. More specifically, we examined (1) self-reports of receiving hepatitis B screening and vaccination, (2) knowledge of hepatitis B transmission, and (3) what hepatitis B means to those infected with the disease. Both quantitative and qualitative methods were used to gain insight into the Hmong's understanding of hepatitis B and their screening and vaccination behavior.

Methods

Study design and procedures

Measures of study variables were included in the data collection effort of a parent study on breast and cervical cancer screening among the Hmong in Oregon, which is described in greater depth elsewhere.²⁶ To summarize, in-depth interviews were conducted with Hmong women and men between December 2009 and May 2010. To be eligible, participants had to self-identify as Hmong, be 18 years of age or older, and live in Oregon. Recruitment strategies included both written and oral communication. For example, printed recruitment materials (e.g., postcards, posters) describing the project were placed at various community locations frequented by the Hmong community, and announcements were made at

community meetings, informal gatherings, and activities. The interviews took place either in the participant's home or office, a community center, a library, or a Hmong church. Bilingual and bicultural project staff conducted interviews in Hmong, English, or a combination of both using a semi-structured interview guide. Informed consent was obtained from all participants prior to conducting interviews. The interviews were audio recorded and lasted approximately 45 minutes to two hours. Participants were offered \$25 cash to compensate them for their time and up to \$10 each for transportation and childcare. The study was approved by Oregon State University's Institutional Review Board.

Measures

Measures were taken from existing survey instruments previously used in other research to assess hepatitis B knowledge in Asian American populations.^{17, 27-29} Participants were asked if they had ever heard of the hepatitis B virus. Eleven items assessed participants' knowledge of hepatitis B routes of transmission (e.g., do you think the hepatitis B virus can be spread from person to person by sharing razors with an infected person?) and four items assessed knowledge of hepatitis B sequelae (e.g., do you think people with hepatitis B can be infected for life?); response categories were yes, no, and don't know.²⁷⁻²⁹ Correct answers were coded "1" and incorrect or don't know responses were coded "0." Summary scores were calculated for both transmission (score range from 0-11) and sequelae knowledge (score range 0-4), with high scores reflecting more accurate knowledge.

Participants were also asked if they had ever been screened and vaccinated for hepatitis B. Response categories included yes, no, and don't know. Receipt of screening and vaccination questions were followed by open-ended questions about the ease and difficulty of getting screened and vaccinated. To assess participants' hepatitis B status, participants were asked if a doctor or other health care provider had ever told them that they have hepatitis B. In addition, participants were asked if a doctor had ever recommended screening, if they had a family member with hepatitis B, and if they had ever attended a hepatitis B education workshop.

Participants who reported testing positive for hepatitis B were further asked about their beliefs and understanding of their illness. The subsequent questions were guided by Kleinman's explanatory models approach³⁰ and included questions such as: what do you call this problem (hepatitis B) in Hmong?; what do you believe is the cause of hepatitis B?; and what do you think hepatitis B does inside your body?

Finally, standard demographic questions assessed participants' social and health status such as gender, age, years of education, and health insurance status.

Data analysis

Quantitative data were analyzed using PASW version 18.0 (SPSS, Inc., 2008; Chicago, IL). Data analyses included univariate (descriptive) and bivariate analyses. Means, frequencies, and percentages were used to summarize demographic, hepatitis B status, and knowledge variables. Mean differences in transmission and sequelae scores by demographic variables, screening, and vaccination were assessed using independent samples t-test.

Qualitative data were analyzed using content analysis. Two research team members (one of the authors and research assistant) independently coded three transcripts using NVivo 8 (QSR International, Cambridge, Mass.) and constructed a preliminary list of codes. Through an iterative consensus process, the two research team members compared, discussed, and finalized a foundational list of codes. The two research team members separately coded all of the transcripts using the foundational code list. New codes that emerged from the data were discussed and added to the list of codes. The author analyzed the coded transcripts to

identify themes and chose quotations that illustrated the themes. Selected quotations are noted with participant's sex and age by decade.

Results

Participant characteristics

The final sample consisted of 44 women and 39 men (n=83) (Table 1). The average age of participants was 38.8 years (SD=13.2), and more than half of were born outside of the U.S. (61.4%). Most of the participants had health insurance (83.1%), and more than half reported having a primary care provider (61.4%) and sought preventive care (53%).

Hepatitis B screening and vaccination

Nearly all of the participants had heard of hepatitis B (96.4%) (Table 2), and more than half reported having been screened for hepatitis B (53.0%). Of those participants who reported having been screened, most found the screening procedure to be easy and convenient. Younger participants were also required to get screened for school, as explained by a male participant (20s), "It [getting screened for hepatitis B] was never of an importance in my family and so until it was required by [university name] to get enrolled, that was the only time I actually got screened for it [hepatitis B]." Some participants, however, did convey that not knowing what was involved in the screening process or why it was necessary posed some difficulty in getting screened. One female participant (30s) described it this way, "Nobody explains to you how it's, you know, how the process gonna go. So, just make you feel uncomfortable... and feeling don't want to go get the exam cause you don't know what things to expect." Another female participant (30s) concurred, "I think it's not knowing, not really knowing what it [screening for hepatitis B] was at the time, like what it meant or why I needed it."

Half of the sample reported having been vaccinated (50.6%), and similar to the screening process, of those who were vaccinated most participants reported that the vaccination process was uncomplicated. Immunization requirements for either school or employment purposes were common reasons for getting vaccinated among younger participants. Others spoke about how family was a motivating factor to get vaccinated because family members either took participants in for vaccinations or were also vaccinated themselves. A male participant in his 20s articulated, "What made it easy was, uh, the whole family went. Oh yeah, a lot of comfort there. Well, everybody else got vaccinated, too, so that made it easy." Nearly two-thirds of the participants had never received a doctor's recommendation to get screened for hepatitis B (63.4%), and most had never attended a hepatitis B educational workshop (90.4%). Only seven participants (five females and two males) reported testing positive for hepatitis B and their age ranged between 26 to 45 years. Although it was not a strong theme, a few participants were confused as to which viral hepatitis they received vaccinations for (hepatitis A or B) as indicated by a male (50s) participant, "I think when we went to get vaccinated, I don't remember if it was hepatitis A or B. Maybe we got vaccinated for A, but I don't remember...we [got] shot twice, so it's good for our lifetime."

Knowledge of hepatitis B

In general, knowledge about hepatitis B transmission was low (Table 3). Although most participants were able to correctly identify that hepatitis B is transmitted through sexual intercourse, by sharing needles, and from mother-to-child during birth, nearly half were unaware of other routes of transmission such as by sharing toothbrushes and razors. Almost half of the participants inaccurately believed that the virus could be spread by eating food prepared by or sharing food plates with someone who is infected. Most participants knew

that hepatitis B can cause liver cancer and death, and that infection is life-long; yet, more than half of the participants believed that hepatitis B infection is curable.

As shown in Table 4, hepatitis B transmission knowledge score was significantly higher among younger participants, those born in the U.S., and those who reported seeking preventive care. Sequelae knowledge score was only significantly higher for those who reported seeking preventive care compared to those who did not seek preventive care. Transmission and sequelae knowledge scores were not associated with screening and vaccination (data not shown).

The meaning of hepatitis B

Most participants who reported testing positive for hepatitis B (n=7) did not know what to call their illness in Hmong. One female participant (30s) called it *mob ntshav daj* [means “illness that makes your blood yellow”], a phrase used to describe hepatitis B in Hmong.

Some participants with hepatitis B believed that their infection occurred at birth, while others were unclear about what caused their illness. One female participant (20s) thought that her infection was caused by “bad water.”

Participants were also asked about how they thought their disease would progress. At the time of data collection, only one participant (male, 30s) showed physical signs of chronic infection. He spoke about being often sick and revealed that he was unemployed and did not have health insurance, which made managing his illness difficult. Other participants remarked that they did not know how their condition would progress or if disease symptoms would develop at all. “I could be fine, no sick, no symptoms. Or my body could trigger and I could have it,” stated a female participant (20s).

Most of the hepatitis B positive participants believed that their illness was not serious. In contrast, the one male participant with chronic hepatitis B symptoms conveyed that his condition was dire, “I think it's really serious, and ...I think that there needs to be a little bit more education out there on making sure that you get tested and screened for it because it's, um, a liver isn't an easy organ to come by and...and waiting lists are forever.”

Knowledge of what hepatitis B does inside the body was lacking amongst participants. A few of the participants guessed that the disease affected the liver, but other participants did not know.

Honestly, I don't know. The liver...um, like a liver failure?...I think it just doesn't filter, help you filter your body...slows down the liver. (female, 20s)

Another female participant (30s) spoke about her condition and the precautions that she takes to prevent transmission to others,

Right now, it's just lying dormant. We carry it and that's all...we have the ability to infect other people, so you try not to, you know, share food, so you don't try to chew food and give it to your baby,... protect yourself when you have sexual intercourse.

As for how hepatitis B affects one's mind and body, one female participant (in her 30s) described it this way:

It makes you depressed and when you're depressed, you're not thinking clearly, and it makes you unresponsive to wanting to do anything. You lose complete motivation...if you're depressed and you are convinced that you've got hepatitis B

and it's the end, why are you gonna go for help? So, I think it takes a, it's a huge emotional toll.

Participants revealed that what they most feared about hepatitis B was getting cancer, suffering, and dying. The following quotation illustrates these fears,

That it could be nothing one day and then it could be something the next day...there's a lot of suffering. I think there's a lot of pain and suffering that's involved in it. (female, 30s)

Finally, participants discussed that the cost of treatment and the effects of cancer treatments on their bodies were things they most feared about treating their illness. A female participant reported that she had no fears, stating that she does not worry about the disease and has forgotten to be afraid. With a different perspective, the male participant with chronic hepatitis B discussed his fears, "I don't really have fear of the treatment. It's the end result that's mostly feared...the end result of the disease."

Discussion

This study examined Hmong women and men's knowledge of hepatitis B and their receipt of hepatitis B screening and vaccination. The results show that although most participants were aware of hepatitis B, there were still large gaps in knowledge. Our findings were consistent with Butler et al.'s study in which participants had low knowledge of virus transmission through sexual intercourse, toothbrushes, and razors;¹⁷ all of which are important routes of hepatitis B transmission involving blood.³ In addition, the Hmong in our study held some misconceptions about how hepatitis B is spread, such as by casual contact with someone who is infected. Despite the high awareness of hepatitis B among our study sample, we cannot assume that the larger Hmong population in Oregon has the same level of awareness or a comprehensive understanding of the disease. As shown from our qualitative results, participants who reported having hepatitis B did not have a thorough understanding of their illness. Most were unsure about what caused their illness and what the virus could do to their bodies. The lack of knowledge about the disease may be due, in part, to poor health literacy. Additionally, almost all of those participants who reported being hepatitis B positive were asymptomatic, which may influence how much priority is placed on their illness. Although our study sample was small, our findings do provide new insight into how well the Hmong understand hepatitis B. Intervention strategies should address knowledge deficits and improve health literacy related to hepatitis B diagnosis, treatment, and disease management.

Screening and vaccination rates in this study sample were much higher than reported in other studies with the Hmong,^{17,20} but despite half of the participants having been screened or vaccinated, just as many had not or did not know if they had ever been screened or vaccinated. Our findings also showed that knowledge was not associated with screening or vaccination. Possible explanations for the high screening and vaccination rates but low knowledge could be because participants were required to get screened or vaccinated for school or employment and were, perhaps, not fully informed about the purpose of hepatitis B screening and vaccination. Furthermore, less than 10% of the participants reported testing positive for hepatitis B infection, which is comparatively lower than other studies with the Hmong,^{9,18} suggesting an underestimation of people who may be hepatitis B positive. Potential reasons for this underestimation may be that Hmong in our study may not have been able to recall being diagnosed or understood their doctor's diagnosis. Another reason may include fear that others in the Hmong community might find out about their hepatitis B status. All of the interviews were conducted by Hmong project staff and the Hmong community in Oregon is fairly small (2,920)³¹ further substantiating this concern.

Participants who were younger, born in the U.S., and reported seeking preventive care had greater knowledge of hepatitis B transmission, which suggests that Oregon's Hmong population may be more acculturated than Hmong in other parts of the U.S. Public health professionals could target those who are more acculturated to carry out hepatitis B prevention and screening messages to Hmong who are less integrated into the larger society. Tailored intervention messages should focus on eliminating hepatitis B transmission through blood and bodily fluids. We also recommend that doctors take the opportunity during preventive care visits to discuss hepatitis B prevention with their Hmong patients. Many Hmong in our study reported that they had not been recommended by a doctor to get tested for hepatitis B, suggesting that some providers may be less aware of the high risk of hepatitis B infection in this population and that additional education with providers may be beneficial. The literature has shown that many Asian Americans rely on providers' recommendations for preventive screenings, such as for cancer,³²⁻³³ therefore, increasing provider knowledge could potentially lead to increased hepatitis B screening and vaccination in this population.

This study explored hepatitis B knowledge, screening, and vaccination behaviors among Hmong in Oregon, a state where few culturally specific hepatitis B services and resources exist. Our findings may help health educators and providers better understand Hmong's knowledge and/or misconceptions of hepatitis B and in turn develop health promotion programs to improve the Hmong's understanding of the disease. There are limitations that need to be addressed. The non-probability sample makes it inappropriate to generalize the findings beyond the study sample. Another limitation is that screening and vaccination self-reporting might be under or overestimated due to inaccurate participant recall, desirability response bias, and confusion about other types of testing and vaccination (e.g., hepatitis A). In this study, we believe that they are overestimated given the Hmong's low knowledge of hepatitis B. To address this limitation, future research could examine participant's medical records or conducted serological testing; these procedures were beyond the exploratory nature of this study. Finally, to better determine participants' immunity to hepatitis B, a question about how many of the three hepatitis B injections participants received could have been included. The addition of this question in future studies might help clarify which type of viral hepatitis vaccination is received (e.g., hepatitis A or B).

Clearly, more research is needed to better understand Hmong women and men's knowledge of, beliefs, and screening and vaccination behavior toward hepatitis B. The lack of understanding about hepatitis B infection can contribute to continued transmission, late diagnosis, delay in treatment, and poor health outcomes for this population.³⁴ This study underscores the importance of developing strategies that target both community and providers to better inform Hmong of the health risks of hepatitis B infection and increase rates of screening and vaccination in this population.

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Table 1

Participant characteristics

Characteristics	Frequency (%) or M (SD) (n = 83)
Gender	
Men	39 (47.0)
Women	44 (53.0)
Mean age in years	38.8 (13.2)
18-39	45 (54.2)
40	38 (45.8)
Education	
Never attended - high school graduate or GED	41 (49.4)
Some college or more	42 (50.6)
Married	68 (81.9)
Foreign-born	51 (61.4)
Have health insurance	69 (83.1)
Have a primary health care provider	51 (61.4)
Does seek preventive care	44 (53.0)
English proficiency	
Understand pretty well – very well (n = 72)	58 (80.6)
Speak pretty well – very well (n = 81)	63 (77.7)
Read pretty well – very well	60 (72.2)
Write pretty well – very well	58 (69.9)
Hmong proficiency	
Understand pretty well – very well (n = 71)	69 (97.2)
Speak pretty well – very well (n = 82)	64 (78.0)
Read pretty well – very well	41 (49.4)
Write pretty well – very well	33 (39.8)

Table 2

Hepatitis B characteristics

Characteristic	<i>Gender</i>		
	<i>All participants (n = 83) n (%)</i>	<i>Men (n = 39) n (%)</i>	<i>Women (n = 44) n (%)</i>
Ever heard of hepatitis B			
No	3 (3.6)	-	3 (6.8)
Yes	90 (96.4)	39 (100)	41 (93.2)
Screened for hepatitis B			
No	27 (32.5)	11 (28.2)	16 (36.4)
Yes	44 (53.0)	23 (59.0)	21 (47.7)
Don't know	12 (14.5)	5 (12.8)	7 (15.9)
Vaccinated for hepatitis B			
No	25 (30.1)	11 (28.2)	14 (31.8)
Yes	42 (50.6)	21 (53.8)	21 (47.7)
Don't know	16 (19.3)	7 (17.9)	9 (20.5)
Doctor recommended screening			
No	53 (63.4)	26 (66.7)	27 (61.4)
Yes	30 (36.6)	13 (33.3)	17 (38.6)
Family member who have hepatitis B			
No	44 (53.0)	17 (43.6)	27 (61.4)
Yes	31 (37.3)	16 (41.0)	15 (34.1)
Don't know	8 (9.6)	6 (15.4)	2 (4.5)
Ever attended hepatitis B education workshop			
No	75 (90.4)	34 (87.2)	41 (93.2)
Yes	8 (9.6)	5 (12.8)	3 (6.8)
Have hepatitis B			
No	76 (91.6)	37 (94.9)	39 (88.6)
Yes	7 (8.4)	2 (5.1)	5 (11.4)

Table 3**Hepatitis B knowledge**

Knowledge Variable	Correct Answer	% Correctly Answered (<i>n</i> = 83)
<i>Transmission</i>		
If someone is infected with the hepatitis B virus, but they look and feel healthy, do you think that person can spread the hepatitis B virus?	Yes	68.7
Do you think the hepatitis B virus can be spread from person to person:		
by eating food prepared by the infected person?	No	55.4
by sharing a toothbrush with an infected person?	Yes	59.0
by eating food that has been pre-chewed by an infected person?	Yes	62.7
by sharing food plates with someone who is infected?	No	51.8
by being coughed on by an infected person?	No	45.8
by sharing razors with an infected person? (<i>n</i> = 82)	Yes	55.4
by having sexual intercourse with an infected person?	Yes	60.2
when intravenous drug users share needles with each other?	Yes	85.5
by holding hands with an infected person?	No	89.2
from mother-to-child during birth?	Yes	80.7
<i>Sequelae</i>		
Do you think hepatitis B causes liver cancer?	Yes	67.5
Do you think someone can die from hepatitis B?	Yes	83.1
Do you think people with hepatitis B can be infected for life?	Yes	67.5
Do you think a person infected with hepatitis B can be cured?	No	45.8

Table 4

Differences in mean value of demographic characteristics and hepatitis B knowledge scores

Characteristic	Transmission Score Mean (SD) (n = 83)	t	df	Sequelae Score Mean (SD) (n = 83)	t	df
Age						
18-39 years	7.60 (2.00)	2.24 *	81	-	-	-
40 years and over	6.61 (2.05)					
Place of birth						
Foreign-born	6.53 (2.11)	-3.68 ***	81	-	-	-
U.S.-born	8.13 (1.58)					
Preventive care						
No, does not seek preventive care	6.31 (2.28)	-3.74 ***	81	2.21 (1.20)	-3.36 **	81
Yes, does seek preventive care	7.89 (1.53)			3.02 (1.02)		

Note: SD = standard deviation; *df* = degrees of freedom; scale of 0-11.*
 $p < .05$ **
 $p < .01$ ***
 $p < .001$.