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Knowledge and Behaviors toward Hepatitis B and the Hepatitis B Vaccine in the Laotian Community in Minnesota

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Abstract

Minnesota is home to a large population of immigrants from Laos as well as one of the largest disparities in hepatitis B (HBV) infection; in Minnesota, Asians are 80 times more likely to be infected than Whites. In response to community concern, a community-based participatory research project was conducted involving a cross-sectional study of 167 adult Laotian immigrants in the Minneapolis/St. Paul metropolitan area assessing knowledge and behaviors related to HBV and its vaccine. Fifty-eight percent of the participants reported not knowing about HBV and just under half incorrectly reported on person-to-person transmission. As expected, vaccination and screening for HBV was more common among those who knew of HBV ($p=0.02$ for both). Fourteen (8.4%) of the participants had been vaccinated, however, only 2 (14.8%) of those individuals received all three doses. This study outlines gaps in knowledge and resources that could address the staggering HBV disparity in this community.

Keywords

hepatitis B; vaccination; screening; Laotian; immigrant; community based participatory research

INTRODUCTION

Approximately 2 billion people worldwide have been infected with the hepatitis B virus (HBV) and 350 million people are living with chronic HBV [1]. Chronic HBV is the cause

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for about 60–80% of primary liver cancer cases worldwide [2]. The mode of transmission of HBV is through blood-to-blood contact, unprotected sex with an infected person, using infected needles, and from an infected mother to her newborn during birth [3]. Chronic HBV infection can result in liver failure, cirrhosis, and liver cancer [1,4].

Rates of HBV infection and liver cancer represent one of the greatest health disparities for Asian Americans and Pacific Islanders [4,5]. Several factors have been identified as barriers to screening for HBV virus infection in Asian and Pacific Islanders, these include a lack of knowledge about HBV transmission, its risk factors, and health consequences [6,7]; other barriers to screening include low socioeconomic status, low educational background, language, and cultural beliefs and values [6,8].

Approximately 1.25 million people are infected with chronic HBV in the U.S. and Asians and Pacific Islanders (APIs) account for half [4]. The majority of these individuals acquired their infection at birth from an infected mother [5], and the majority of liver cancer cases among APIs are a result of chronic HBV [8]. Depending on the country of origin, about 5–15% of API immigrants have chronic HBV. The prevalence rate of HBV is 8.9% in foreign-born Asian Americans compared with 0.13% for non-Hispanic Whites [9]. According to the Minnesota Department of Health, in 2010 the prevalence of chronic HBV was highest among this group at 3,997 per 100,000 Asians; this prevalence is 80 times greater in Asians than in Whites [17].

In Asia, the prevalence of chronic HBV infection remains greatest in China and Southeast Asia. Approximately one in seven Southeast Asians is infected with chronic HBV [10]. Since the end of the Vietnam War, the United States has received an influx of almost a million Southeast Asian refugees [11]. These refugees arrived in the U.S. with high rates of several conditions such as tuberculosis, anemia, and HBV [12]. Laotians were one of the four Southeast Asian groups that settled in the U.S. in the late 1970–80's; approximately 76% of foreign-born Laotians entered the U.S. before 1990 [13]. According to the 2010 U.S. Census, there are over 200,000 Laotians in the U.S., most residing in the states of California, Texas, Washington, North Carolina, and Minnesota. Minnesota has one of the largest Laotian populations in the U.S. (4.8%), constituting about 5% of the Asian population in Minnesota [13].

A study evaluating the cancer burden in a Californian Laotian community (excluding ethnically Hmong) found that liver cancer was the second most common cancer diagnosis, which was 13 times more common than in the general population [16]. In fact, the rate of liver cancer in Laotian males was higher than other Asians [8]. Another study also found that liver cancer was the most common new cancer diagnosis in Laotian males in California [9]. Laotian/Hmong individuals were also more likely to present with liver cancer at a later stage, having metastasis to remote sites, and less likely to undergo local surgical treatment, resection or liver transplantation, resulting in worse survival outcome compared to other Asians [9]. These findings suggest high rates of disparity for Laotian immigrants in HBV infection, screening and treatment even within Asians in the U.S.

Although the Laotian immigration to the U.S. started more than three decades ago, there is a lack of population-based data on the Laotian population [16], with nearly all that has been documented coming from California. Despite the high incidence of HBV infection and liver cancer, little is known about Laotian immigrants' knowledge and beliefs about hepatitis B. The primary purpose of this study was to determine HBV and HBV vaccine knowledge and behaviors among the Laotians in Minnesota. Secondly, we aimed to determine factors that were associated with HBV vaccination and screening.

METHODS

The data were from a community-based participatory research study, conducted by investigators at the University of Minnesota by invitation from leaders in the Laotian community in metropolitan area of Minneapolis/St. Paul, Minnesota. The Laotian community leaders from the Lao Assistance Center of Minnesota and the University of Minnesota investigators developed a survey to address the needs of the community. The Lao Assistance Center of Minnesota (LACM) aims to improve the quality of life of Laotians in Minnesota through cultural equity promotions, education, and youth development (<http://www.laocenter.org>). Specifically, the LACM offers counseling and advocacy on several social services including financial, employment, housing, and parenting. With regards to health services, the LACM aims to identify and address the barriers that prevent Lao immigrants from enrolling in public health care programs, or from paying affordable monthly premiums. Health outreach activities, including cancer prevention education, are also regularly conducted by the LACM.

The subsequent cross-sectional study on HBV was conducted from December 2010 through March 2011. The research aims, methodology and data were developed in conjunction with the Lao Assistance Center of Minnesota. Laotians who had previously utilized the Center and present on their registry and who were at least 18 years old were invited to participate in the study.

A letter was mailed to the last known address of each of the 250 eligible potential participants; these letters of invitation were written and signed by well-known staff at the Lao Assistance Center. Participation in the study included willingness to provide a blood sample (for the larger study on the prevalence of HBV) and to provide survey data in either English or Laotian. Signed informed consent was provided after the participant was able to ask questions. The study was approved by the University of Minnesota Institutional Review Board.

One hundred and ninety-eight out of 250 individuals contacted consented to participate in the study, thus yielding a response rate of 79.2%. Surveys were conducted in-person by bilingual (English and Laotian) interviewers using a 67 close-ended self-administered questionnaire at the Lao Assistance Center of Minnesota. The structured questionnaire asked the participants about demographics, lifestyle in regards to alcohol consumption and tobacco usage, hepatitis knowledge, medical history, health seeking behaviors, and risk factors for sexually transmitted diseases. All answers from a given participant to the questionnaire verbally and/or in writing, dependent on Participant's willingness and comfort, were recorded and coded in the questionnaire. All data were coded and checked before they were computerized.

Statistical Analysis

The sample size from the study was 198 participants. Participants with missing information on the primary outcomes of our research aims ($n=25$) were excluded from the analysis. As this analysis was only interested in immigrants to the U.S., the few participants born in the U.S. were also excluded from analysis ($n=6$). This left a final sample size of 167 participants for data analysis. Descriptive statistics were used to summarize demographic variables (age, gender, marital status, level of English spoken, highest education level, household income, health insurance status and medical provider status), hepatitis vaccination and screening behavior. Chi-square statistics were used to examine the univariate relationship between the dependent variables of being screened and vaccinated and the independent variables of demographics, knowledge, attitude and behaviors about HBV and the HBV vaccine.

Statistical significance was determined by a p-value <0.05. Data analysis was performed using SAS v9.2

RESULTS

Of the 167 participants, 75% were aged 31 – 65 years old, a little over half were women. About half of the participants were married or partnered. Regarding socio-demographics, 80% had a high school or less education and 60% had an annual income of less than \$20,000. (Table 1) The overwhelming majority of individuals (63.1%) rated their own level of English spoken as “a little”, most did not have health insurance (70%) or a regular medical provider (58.1%).

Table 1 also shows the prevalence of HBV vaccination initiation. Fourteen (8.4%) participants reported having HBV vaccination while 19 (11.4%) reported having HBV screening before. Participants with fluent speaking in English were more likely to get vaccinated than those who were not (41.7% versus 18.2%, $P = 0.02$). There was no statistically significant difference in the distributions of other demographic factors in Table 1 between vaccinated and not vaccinated individuals. Similarly, no statistically significant difference in the distribution in any variables was detected between participants with and without screening for HBV.

Regarding the knowledge of HBV, 58% of the participants had never heard of the HBV. As anticipated, those who knew of HBV were more likely to initiate vaccination and be screened ($p=0.02$ for both). More than half of the participants knew that hepatitis B spreads from person to person (55.8%) and that asymptomatic people could spread hepatitis B (53.9%). Overall however, only 20% of the participants knew that sexual contact was a mode of transmission for hepatitis B (Table 2).

Table 3 describes behaviors about HBV. Nearly all of the participants failed to receive a recommendation by a health care provider to receive the hepatitis B vaccine (86.6% overall), however, this differed by whether or not they had received the vaccination or were screened. Those who received the HBV vaccine or were screened were more likely to have received the hepatitis A vaccine.

Although 8.4% of the participants had initiated HBV vaccination, only two participants received all three doses. (Table 3) They were both female with a mean age of 25 years and both were born outside of the United States but were fluent in English (data not shown).

The overwhelming majority of participants had never been tested for HBV (82.6%) or hepatitis C virus (88.0%) (Table 4). Those who were vaccinated were more likely to have been tested for hepatitis C ($p<0.001$), while those who were screened for HBV were also more likely to have been screened for hepatitis C and been diagnosed with hepatitis C.

DISCUSSION

This study examined the knowledge and behaviors toward HBV in a Laotian community in Minnesota. Our findings suggest important barriers that may impact HBV vaccination and screening in this population. The overall findings from the study show that there is a need for culturally appropriate health intervention to improve HBV vaccination and screening in this population.

First, the prevalence rate of initiation of HBV vaccination and screening in this population is very low compared to other Asian American groups [10,18,19,20] suggesting the need for public health interventions providing HBV education to Laotian Americans and their

healthcare providers. Perhaps the first step in increasing these rates begins with improved health messaging about HBV to the community. This study shows that most of the participants had never heard of HBV and only a little over half of the participants believed that asymptomatic people can spread HBV. Culturally appropriate interventions addressing HBV have increased vaccination and screening among specific groups of Asian Americans [21].

We found a mixture of correct knowledge in our sample of Laotian Americans. Over half of the participants knew that HBV spread from person to person but very few knew specific modes of transmission; there was a notable lack of knowledge about sexual transmission. We found that the majority of participants believe HBV causes liver cancer, and that HBV is a serious condition that people can die from. However, it should be noted that 58% reported never having heard of HBV, yet the predominant understanding that it causes liver cancer. This information suggests again the need for culturally-specific health interventions to educate about HBV in the Laotian community in Minnesota. We postulate that these gaps in knowledge may stem from a lack of English proficiency, as nearly 17% of our participants did not speak any English combined with over 60% who had only little ability to speak in English.

Our participants reported uncertainty as to whether they think HBV can be treated or prevented. Alarming, over one-quarter of participants did not think that this infection could be prevented or treated. This limited knowledge about HBV vaccination may have resulted from a not having received an offer to vaccinate by their medical providers, as the majority of our participants reported. Even among those who did initiate the vaccination, only 14.3% completed the series of vaccinations needed for long lasting immunity. Yet this may not be surprising as that most also reported a lack of health insurance and not having a primary medical provider. Health coverage may not be the only factor, as our participants, on average, were in their 50's and for this another individual-level factors, may not have been indicated for the vaccination at this age.

Under-education about HBV may also be a result of current beliefs about HBV in the U.S. Because HBV is no longer considered a serious problem in the U.S. due to the available HBV vaccine [22], it may not be commonly addressed by medical providers. In addition, treatment of HBV itself can be costly and intense [23]; though, it is difficult to interpret from our data why participants have not heard of hepatitis treatments.

Lack of health care coverage and health care access were noted as barriers to receiving a vaccination among individuals in this population. Not being able to afford the vaccine, don't know where to go to get vaccinated, and limited English were the most frequent responses for barriers to vaccination. However, we suspect that there are also other currently unidentified barriers as 41.4% of the participants selected 'other' reasons for not obtaining a vaccination. Unfortunately, we do not data on those other factors.

The overwhelming majority of our participants had never been tested for HBV. This suggests that a large portion of HBV carriers in the Laotian community in Minnesota do not know their status. The disparity in screening may be due to similar barriers in access to health care, lack of English proficiency, cultural barriers, fear, or stigma [24,25]. Our evidence suggests that there is a disconnect between knowledge about HBV causing cancer and the importance of being screened for HBV, and subsequently how to proceed after getting screened to increase early detection of liver cancer.

Findings from our study should be viewed with the following limitations. First, our sample may not be generalizable to the Laotian Community of Minnesota because it was not a random sample of all adult Laotians. Participants were users of the Lao Assistance Center of

Minnesota, who were asked to be a part of a hepatitis screening study. The LACM assist Laotians that are of low-income and in need of access to resources such as finding health insurance and care, housing assistance, employment, and family stability. Our participants' involvement with the LACM may have provided them more access to health care compared to a Laotian immigrant who did not have access to such a center. Therefore, our study may have slightly higher health knowledge and improved health behaviors because of the involvement of the LACM on the lives of these sampled individuals. These improved health behaviors may lead to higher rates of healthcare coverage than, again, those immigrants without access to such assistance programs. In states, and during times, in which pre-existing conditions prevented affordable healthcare coverage, we may have expected to see differential HBV status by healthcare coverage. However, this study was conducted post implementation of the federal 2010 Affordable Care Act preventing ineligibility of affordable coverage due to a pre-existing condition such as chronic HBV. Including only LACM members may have also led to selection bias because some refused to participate in the study if they already knew of their hepatitis B status, or if they believed that they might be infected. This also accounts for the small sample size of the study, which is the second limitation. Due to the small sample size of the study, our estimates may not be exactly precise. Finally, the last limitation is that the study is a cross-sectional study so causality cannot be inferred from the study.

In summary, our study provides important information on the upstream health knowledge and behaviors that may significantly contribute to the high rates of liver cancer and case-fatality from liver cancer in the Laotian community. Continued failure to address issues of HBV vaccination and screening in this community will further contribute to the increased mortality rate from liver cancer and the reduced time to death among Laotians in the U.S.

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Table 1

Demographic characteristics of the study participants (N=167). Demographic characteristics are also stratified by the primary outcomes of the research aims, hepatitis B vaccination and screening status.

N=167	Total %	Vaccinated n=14 %	Not Vaccinated n=153 %	X ²	p-value	Screened n=19 %	Not screened n=148 %	X ²	p-value
Age, yrs (mean, SD)	52 (13.3)	47.6 (16)	52.4 (13)	1.29 ^b	0.2	50.4 (13.6)	52.2 (13.3)	0.5 ^b	0.6
30	9.58	14.3	9.16			10.6	9.46		
31–50	35.3	35.7	35.3			36.8	35.1		
51–65	40.1	35.7	40.5			36.8	40.5		
66+	15	14.3	15	0.43	0.9	15.8	14.9	0.1	1
Gender									
Female	54.6	76.9	52.6			68.4	52.7		
Male	45.4	23.1	47.4	2.9	0.09	31.6	47.3	1.7	0.2
Marital Status									
Single	26	14.3	27			21.1	26.6		
Partnered	4.94	7.14	4.73			5.26	4.9		
Married	45.1	64.3	43.2			57.9	43.4		
Divorced	13.6	7.14	14.2			0	15.4		
Widowed	8.02	7.14	8.11			14.8	6.99		
Rather not say	2.47	0	2.7	3.1	0.7	0	2.8	6.1	0.3
Highest education level									
<High school	41.5	45.5	41.2			40	41.7		
High school	39.5	36.4	39.7			40	39.4		
Some college	16.3	18.2	16.2			20	15.9		
Bachelor's degree	2.04	0	2.21			0	2.27		
Master's degree	0.68	0	0.74	0.42	1	0	0.76	0.6	1
Household income									
<10,000	38	50	36.7			43.8	37		
10,000–19,999	25.9	10	27.6			18.8	27.2		
20,000–29,999	16.7	0	18.4			6.25	18.5		
30,000–39,999	10.2	10	10.2			18.8	8.7		
40,000–49,999	0.93	0	1.02			0	1.09		

N=167	Total %	Vaccinated n=14 %	Not Vaccinated n=153 %	X ²	p-value	Screened n=19 %	Not screened n=148 %	X ²	p-value
50,000–74,999	6.48	20	5.1			12.5	5.43		
75,000–99,999	1.85	10	1.02	10.5	0.1	0	2.17	4.7	0.6
Level of English spoken									
None	16.9	33.3	15.5			22.2	16.2		
A little	63.1	25	66.2			50	64.8		
Fluent	20	41.7	18.2	8.1	0.02	27.8	19	1.5	0.5
Health insurance									
Yes	29.8	36.4	29.3			23.5	30.6		
No	70.2	63.6	70.7	0.24	0.6	76.5	69.4	0.3	0.5
Medical provider									
Yes	37.5	25	38.5			16.7	40.1		
No	58.1	75	56.8			83.3	54.9		
Unsure	4.38	0	4.73	1.7 ^a	0.4	0	4.93	5.5 ^a	0.07

^a Subjects with missing values were excluded from statistic test.

^b t-test instead of chi-squared test

Table 2

Knowledge of the hepatitis B virus and its adverse health sequelae among the study participants (N=167). This knowledge is then stratified by the primary outcomes of the research aims, hepatitis B vaccination and screening status.

N=167	Total %	Vaccinated n=14 %	Not Vaccinated n=153 %	X ²	p-value	Screened n=19 %	Not Screened n=148 %	X ²	p-value
Know of HBV									
No	58	28.6	60.8			33.3	61.1		
Yes	42	71.4	29.2	5.5	0.02	66.7	38.9	5.1	0.02
Know HBV spread person to person									
No	44.2	35.7	45.1			44.4	44.2		
Yes	55.8	64.3	54.9	0.5	0.5	55.6	55.8	0.0004	1
Know mode of transmission									
Air or cough	7.41	10	7.2			6.67	7.5		
Sharing food/utensils	1.48	0	1.6			13.3	0		
Sharing needles	17.8	20	17.6			20	17.5		
Sexual contact	20	10	20.8			6.67	21.7		
Two of the above	46.7	50	46.4			33.3	48.3		
Three of the above	1.48	0	4.8			6.67	0.83		
All four	5.19	10	1.6	1.5	1	13.3	4.17	28.5	<0.001
Think if asymptomatic person can spread HBV									
No	12.7	28.6	11.3			15.8	12.3		
Yes	53.9	57.1	53.6			57.9	53.4		
Not sure	33.3	14.3	35.1	1.8 ^a	0.2	26.3	34.3	0.06 ^a	0.8
Think can be infected with HBV for life									
No	9.76	14.3	9.33			15.8	8.97		
Yes	73.2	85.7	72			79	72.4		
Not sure	17.1	0	18.7	0.1 ^a	0.8	5.26	18.6	0.5 ^a	0.5
Think HBV causes liver cancer									
No	6.06	7.14	5.96			10.5	5.48		
Yes	80.6	85.7	80.1			89.5	79.5		
Not sure	13.3	7.14	13.9	0.5 ^a	0.8	0	15.1	3.8 ^a	0.2
Think can die from HBV									

N=167	Total %	Vaccinated n=14 %	Not Vaccinated n=153 %	X ²	p-value	Screened n=19 %	Not Screened n=148 %	X ²	p-value
No	7.23	14.3	6.58			10.5	6.8		
Yes	77.7	71.4	78.3			89.5	76.2		
Not sure	15.1	14.3	15.1	1.1 ^a	0.3	0	17	0.1 ^a	0.7
Think HBV can be treated or prevented									
No	27.5	21.4	28.1			26.3	27.7		
Yes	44.3	50	43.8			57.9	42.6		
Not sure	28.1	28.6	28.1	0.3 ^a	0.6	15.8	29.7	0.4 ^a	0.5
Think should get vaccinated even if healthy									
No	10.9	7.14	11.3			5.26	11.6		
Yes	89.1	92.9	88.7	0.2	0.6	94.7	88.4	0.7	0.4

^aSubjects with missing value excluded from statistics test

Table 3

Attitude and behavior towards hepatitis vaccination among the study participants (N=167). Behavior and attitude towards hepatitis vaccination is then stratified by the primary outcomes of the research aims, hepatitis B vaccination and screening status.

N=167	Total %	Vaccinated n=14 %	Not Vaccinated n=153 %	X ²	P-value	Screened n=19 %	Not Screened n=148 %	X ²	p-value
Recommended to receive HBV vaccine									
No	86.6	28.6	92			52.6	91		
Yes	13.4	71.4	8	44.4	<0.001	47.4	8.97	21	<0.001
Barriers to vaccination									
Cannot afford	19.6	30	18.7			25	19		
Limited English	12	10	12.2			8.33	12.4		
No transportation	3.01	0	3.25			8.33	2.48		
No child care	1.5	0	1.63			0	1.65		
Don't know where to go	22.6	10	23.6			16.7	23.1		
Other	41.4	50	40.7	2.1	0.8	41.7	41.3	2	0.8
Received HAV vaccine									
Never	93.9	46.2	98			77.8	96		
One dose	3.61	30.8	1.31			11.1	2.7		
Two doses	2.41	23.1	0.65	57	<0.001	11.1	1.35	10	0.007
Received HBV vaccine									
Never	91.6	0	100			52.6	96.6		
One dose	5.99	71.4	0			36.8	2.03		
Two doses	1.2	14.3	0			5.26	0.68		
Three doses	1.2	14.3	0	167	<0.001	5.26	0.68	44	<0.001

Table 4

Attitude and behavior towards hepatitis screening among the study participants (N=167). Behavior and attitude towards hepatitis screening is then stratified by the primary outcomes of the research aims, hepatitis B vaccination and screening status.

N=167	Total %	Vaccinated n=14 %	Not Vaccinated n=153 %	X ²	P-value	Screened n=19 %	Not Screened n=148 %	X ²	p-value
Ever tested for HBV									
No	82.6	14.3	89.9			0	93.2		
Yes	11.4	64.3	6.54			100	0		
Not sure	6	21.4	4.58	52 ^a	<0.001	0	6.76	167 ^a	<0.001
Ever told that have HBV by doctor									
No	94.6	85.7	95.4			89.5	95.2		
Yes	2.41	7.14	1.97			10.5	1.36		
Not sure	3.01	7.14	2.63	2.4 ^a	0.3	0	3.4	6.6 ^a	0.04
Ever tested for HCV									
No	88	42.9	92.1			52.6	92.5		
Yes	6.02	28.6	3.95			31.6	2.72		
Not sure	6.02	28.6	3.95	29 ^a	<0.001	15.8	4.76	30 ^a	<0.001
Ever told have HCV by doctor									
No	95.2	78.6	96.7			84.2	96.6		
Yes	1.21	0	1.32			5.26	0.68		
Not sure	3.64	21.4	1.99	14 ^a	<0.001	10.5	2.74	6 ^a	0.05

^a Subjects with missing values were excluded from statistic test