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HEPATITIS B AWARENESS, TESTING, AND KNOWLEDGE AMONG VIETNAMESE AMERICAN MEN AND WOMEN

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Abstract

Southeast Asians have higher rates of liver cancer than any other racial/ethnic group in the United States. Chronic carriage of hepatitis B virus (HBV) is the most common underlying cause of liver cancer in the majority of Asian populations. Our objectives were to describe Vietnamese Americans' awareness of hepatitis B, levels of HBV testing, and knowledge about hepatitis B transmission; and to compare the HBV knowledge and practices of men and women. A community-based, in-person survey of Vietnamese men and women was conducted in Seattle during 2002. Seven hundred and fifteen individuals (345 men and 370 women) completed the questionnaire. Eighty-one percent of the respondents had heard of hepatitis B (76% of men, 86% of women) and 67% reported HBV testing (66% of men, 68% of women). A majority of the participants knew that HBV can be transmitted during sexual intercourse (71% of men, 68% of women), by sharing toothbrushes (67% of men, 77% of women), and by sharing razors (59% of men, 67% of women). Less than one-half knew that hepatitis B is not spread by eating food prepared by an infected person (46% of men, 27% of women), nor by coughing (39% of men, 25% of women). One-third of our respondents did not recall being tested for HBV. Important knowledge deficits about routes of hepatitis B transmission were identified. Continued efforts should be made to develop and implement hepatitis B educational campaigns for Vietnamese immigrant communities. These efforts might be tailored to male and female audiences.

Keywords

hepatitis B; liver cancer; Vietnamese Americans

INTRODUCTION

The 2000 Census documented over one million Vietnamese Americans, three-quarters (76%) of whom were immigrants to the United States (US).¹ Vietnam is a hyper-endemic area for hepatitis B infection, and the rate of chronic hepatitis B virus (HBV) infection among Vietnamese Americans is over 10 times the general US population rate.²⁻⁴ Chronic carriage of HBV is the most common underlying cause of liver cancer in the majority of Asian populations, and California cancer registry data show that Southeast Asian men and women have higher rates of liver cancer than any other racial/ethnic group.^{5,6} Specifically, the age-adjusted incidence rate among Southeast Asian men is 39.4 per 100,000 compared to 3.1 per 100,000 among non-Latino whites; and rates among Southeast Asian and non-Latina white women are 8.0 and 1.1 per 100,000, respectively.⁶

Exposure to HBV often results in a self-limited infection that can be asymptomatic or present as acute hepatitis, usually followed by immunity.^{7,8} However, a significant proportion of those exposed to hepatitis B become chronically infected. These individuals continue to be potentially infectious to others, and are at considerable risk of liver cancer as well as chronic active hepatitis and cirrhosis.⁸ Chronically infected individuals may benefit from anti-viral therapy (e.g., lamivudine and interferon) as well as timely liver transplantation, and should take precautions to avoid infecting others with the virus.^{2,9,10} Therefore, the American Association for the Study of Liver Diseases recommends that population sub-groups at high risk for chronic HBV infection, including persons born in hyper-endemic areas such as Vietnam, receive hepatitis B testing.²

In Vietnam, transmission of HBV usually occurs vertically at birth.¹¹ However, there is evidence that horizontal transmission through close household contact (e.g., sharing toothbrushes) is responsible for a substantial number of new cases of hepatitis B among Southeast Asians in the US.¹²⁻¹⁴ Additionally, those Vietnamese who are sexually active with members of their community are at high risk of HBV infection.² Vaccines that are effective in preventing hepatitis B infection and its chronic carrier state have been available for over two decades.¹⁵ Strategies for interrupting the transmission of hepatitis B include testing immigrants from hyper-endemic areas for the disease, and vaccinating those who are at risk of infection (e.g., household members of chronic carriers) and have negative HBV serologic markers.^{2,16} Identification of female chronic HBV carriers also allows for early antenatal counseling and appropriate peripartum management to reduce transmission to newborns.

Public health authorities have recommended that agencies serving Asian immigrant communities provide education about hepatitis B transmission; and promote HBV serologic testing, immunization of susceptible individuals, and regular monitoring of chronically infected persons.¹⁷ However, health education programs for immigrant groups should be based on a thorough understanding of the target population's knowledge and practices.¹⁸ In collaboration with a Vietnamese community coalition, we conducted a needs assessment survey of Vietnamese men and women in Seattle, Washington during 2002. This report describes Vietnamese Americans' awareness of hepatitis B, levels of self-reported HBV testing, and knowledge about hepatitis B transmission; and compares the HBV knowledge and practices of Vietnamese men and women.

METHODS

Study Setting

Metropolitan Seattle has the sixth largest Vietnamese population in the US (40,000 according to the 2000 Census). Further, the enumerated Vietnamese population of the greater Seattle area

increased 181% between 1990 and 2000.¹⁹ All study procedures were approved by the University of Washington Institutional Review Board.

Sampling

Census data indicate that Seattle's Vietnamese community is concentrated in the southern part of the city.²⁰ Therefore, our survey sample was drawn from seven contiguous south Seattle zip codes. McPhee and his colleagues at the University of California have shown that over 95% of Vietnamese families share 23 last names.²¹ We applied this list of names to the 2001 telephone book for metropolitan Seattle. Specifically, we identified 1,639 Vietnamese households that were located in the target zip codes. Six hundred and two of these households were randomly selected for inclusion in the survey. Because nine addresses were subsequently found to be duplicates, the final study sample included 593 households.

Household Recruitment

We publicized the survey by placing posters about the study in community settings such as Vietnamese grocery stores. Households received an introductory mailing from the Medical Director of the International Medical Clinic at Seattle's county hospital. Surveys were conducted in participants' homes by bilingual, bicultural interviewers. Men were interviewed by male survey workers and women were interviewed by female survey workers. Participation incentives included posters depicting Vietnamese artwork and a summary of Seattle organizations providing social and health services to Vietnamese families. Respondents were given the option of completing their survey in Vietnamese or English. Five door-to-door attempts were made to contact each household (including at least one daytime, one evening, and one weekend attempt). Each interview took approximately 45 minutes to complete.

Participant Selection

The survey was used to recruit men and women for a subsequent household cancer control intervention program. Therefore, we aimed to interview one man and one woman aged 18–64 years in each household (rather than one individual in each household). Our Vietnamese community coalition believed that the survey response would be negatively impacted if we attempted to roster household members and then randomly select respondents in households with two or more age-eligible men and/or women. However, to ensure our sample was representative of different age-groups, we randomly assigned households to one of two groups: households where we initially asked to speak with a man and a woman in the 18–39 age-group (and then asked to speak with a man and/or woman aged 40–64 if there were no men and/or women in the younger age-group); and those where we initially asked to speak with a man and a woman in the 40–64 age-group (and then asked to speak with a man and/or woman aged 18–39 if there were no men and/or women in the older age-group).

Survey Instrument

Our survey development was guided by an earlier qualitative study, our research group's experience conducting surveys in Asian American communities, and survey instruments previously used by other research groups to evaluate childhood HBV vaccination programs.^{22–26} The survey instrument was developed in English, translated into Vietnamese, back-translated to ensure lexical equivalence, reconciled, and pre-tested.²⁷

Respondents were asked whether they had ever heard about a disease or infection called hepatitis B. After responding to this question, they were read the following statement: "The disease called hepatitis B is an inflammation of the liver caused by a viral infection that makes the skin and eyes go yellow. People with the infection lose their appetite and often experience nausea as well as vomiting." Respondents were then asked if they had ever had a blood test to

see if they currently have hepatitis B or have had it in the past. Survey participants were queried about their age, marital status, and educational level. Respondents also specified how many years they had lived in the US and provided information about their English-language proficiency.

The survey instrument included a section addressing knowledge about hepatitis B transmission. Specifically, respondents were asked whether they thought hepatitis B can be spread by eating food that has been pre-chewed by an infected person (pre-chewing of food for young children is common in Southeast Asian families); during sexual intercourse; during childbirth; by sharing toothbrushes and razors; by lancet therapy (lancet therapy is a traditional Vietnamese treatment that can spread hepatitis B when practitioners do not use sterile procedures); and by someone who looks and feels healthy. Another question asked whether hepatitis B is more easily spread than AIDS. In addition, we queried participants about routes of transmission that are not applicable to HBV. Specifically, we asked men and women whether they thought hepatitis B can be spread by eating food prepared by an infected person, coughing, and holding hands. Because some Vietnamese immigrants have little formal education, we made the response items for the knowledge questions as simple as possible. The response options were yes, no and not sure/don't know.

Data Analysis

Answers to knowledge items with response options of yes, no, and not sure/don't know were dichotomized into yes versus other if the correct answer was yes (e.g., hepatitis B can be spread by sexual intercourse), and no versus other if the correct answer was no (e.g., hepatitis B can be spread during coughing). We created a composite knowledge score (0–11) by summing the number of correct answers to the 11 items addressing hepatitis B transmission. Our study sample included men and women from the same households and individual responses from the same household may have been correlated (i.e., the independence of observations could not be assumed). Therefore, we analyzed the data by bootstrap (bootstrapping households) when comparing men and women for a variable with three or more categories (i.e., demographic variables in Table 1).²⁸ General estimating equations with logit link and binomial error were used in the analysis of binary outcomes (i.e., awareness, testing, and knowledge variables in Tables 2 and 3). Finally, general estimating equations with identity link and constant error were used in the analysis of knowledge score.²⁹

RESULTS

Survey Response

The questionnaire was completed by 715 individuals (345 men and 370 women) from 415 households. Our survey response rates among men and women have been summarized elsewhere.^{30,31} The overall estimated response rate was 80% among men and 82% among women (assuming the same proportions of eligible men and women among those who could and could not be contacted); and the male and female cooperation rates (i.e., response rates among reachable and eligible individuals) were 83% and 85%, respectively. The survey was completed by a man and woman in 300 of these households, a man (but not a woman) in 45 households, and a woman (but not a man) in 70 households. Less than 3% of the respondents elected to complete their survey in English (rather than Vietnamese).

Study Group Characteristics

The demographic characteristics of the study sample are shown in Table 1. Approximately one-third of the study group was in each of the following age-groups: less than 35 years (29%), 35–49 years (35%), and over 50 years (36%). Eighty percent of the respondents were married at the time of the survey, and about two-thirds (65%) had at least 12 years education. Nearly

one-half (43%) of the survey participants had been in the US for less than 10 years, and only 19% reported speaking English fluently or well. Women were significantly less educated ($p < 0.001$) than men. Additionally, female respondents were more likely to have immigrated recently ($p < 0.001$) and were less likely to speak English fluently or well ($p < 0.001$) than male respondents.

Hepatitis B Awareness

Eighty-one percent of all respondents said they had heard of hepatitis B, prior to being given a description of the disease. As shown in Table 2, women were significantly more likely (86%) to have heard of hepatitis B than men (76%) ($p = 0.002$). Older individuals were more likely to have heard of hepatitis B than younger individuals ($p = 0.009$). In addition, participants who had lived in the US for 10–19 years were less likely to have heard of hepatitis B than those who had been in the US for longer or shorter periods of time ($p = 0.047$). There were no significant differences in awareness for the other demographic variables examined in our bivariate analysis. In a multivariate analysis (using general estimating equations) that included all demographic variables, gender ($p < 0.001$) and education ($p = 0.015$) were significantly associated with HBV awareness.

Hepatitis B Testing

Two-thirds (67%) of the survey participants reported HBV testing. The proportions of men (66%) and women (68%) reporting HBV testing were almost equivalent. However, self-reported testing levels differed significantly by age-group. Specifically, the proportions of individuals in the 18–35, 35–49, and 50-plus age-groups reporting hepatitis B testing were 62%, 64%, and 75%, respectively ($p = 0.009$). There was no association between self-reported hepatitis B testing levels and marital status, educational level, length of time in the US, nor English proficiency (Table 2).

Hepatitis B Knowledge

The respondents' knowledge about routes of hepatitis B transmission is summarized in Table 3. Specifically, the proportions of men, women, and the total sample who responded correctly to each question are shown, as well as the p-values for comparisons between male and female participants. Over three-quarters of all survey participants knew that hepatitis B can be spread during childbirth (83%) and by someone who looks and feels healthy (78%). Between one-half and three-quarters knew that HBV can be spread by eating food that has been pre-chewed by an infected person (71%), is not spread by holding hands (75%), can be spread during sexual intercourse (69%), can be spread by sharing toothbrushes (72%), can be spread by sharing razors (63%), and can be spread by lancet therapy (66%). Less than one-half knew that hepatitis B is not spread by eating food that has been prepared by an infected person (36%), nor by coughing (31%), and is more easily spread than AIDS (19%).

Men were more likely than women to know that hepatitis B is not spread by eating food that has been prepared by an infected person ($p < 0.001$), coughing ($p < 0.001$), and holding hands ($p = 0.035$); and HBV can be spread by someone that looks and feels healthy ($p = 0.019$). In contrast, women were more likely to know that HBV can be spread by eating food that has been pre-chewed by an infected person ($p = 0.001$), sharing toothbrushes ($p = 0.003$), and sharing razors ($p = 0.014$). Multivariate analyses (using general estimating equations and adjusting for all demographic variables) were conducted for those knowledge items that were significantly different between men and women in our bivariate comparisons. After adjustment for age, marital status, education, years in the US, and English language fluency, levels of knowledge significantly differed by gender for five of the knowledge variables: food prepared by an infected person ($p < 0.001$), food pre-chewed by an infected person ($p = 0.002$), coughing ($p < 0.001$), toothbrushes ($p = 0.001$), and razors ($p = 0.005$).

The mean composite knowledge score was 6.6 (standard deviation – 2.3) among men and 6.6 (standard deviation – 2.1) among women. Knowledge scores were associated with educational level ($p = 0.02$). Specifically, the mean knowledge score was 6.3 (standard deviation – 2.4) among those with less than 12 years education, 6.7 (standard deviation – 2.1) among those with 12 years education, and 7.0 (standard deviation – 2.1) among those with more than 12 years education. Mean knowledge scores were not associated with any other demographic variables.

DISCUSSION

We found high levels of hepatitis B awareness among surveyed Vietnamese Americans. More than four in five respondents (81%) reported ever having heard of the disease. This proportion was meaningfully higher than the 56% of Vietnamese surveyed during 1998 in Houston, Dallas, and Washington, DC who reported having heard of hepatitis B.³² More than two-thirds (66% of Vietnamese men and 68% of Vietnamese women) reported previous HBV serologic testing; this was a greater percentage than the 38% of Cambodian women who reported testing in a 1999 Seattle survey. We also found that knowledge about specific HBV transmission routes were generally higher than those found in previous studies of Asian American populations.^{33–35} For example, 48% of Cambodian women in the 1999 study answered correctly that HBV could be transmitted through sexual intercourse (compared to 68% of Vietnamese women in this study), and 11% of Cambodian women were aware that coughing is not a potential route of HBV transmission (compared to 25% of Vietnamese women).³⁵

Our *a priori* hypothesis was that levels of HBV awareness, knowledge, and reported previous testing would be higher among Vietnamese women than men. In our previous work we found that Vietnamese women are more likely to have a regular provider than Vietnamese men, and women who receive obstetric care in the US are routinely tested for HBV.^{30,31} Additionally, hepatitis B vaccination is required for kindergarten and elementary school entry in Washington State, and we further assumed mothers may be more likely than fathers to take responsibility for ensuring children receive immunizations. Contrary to our initial hypothesis, however, there were no differences between men and women with respect to testing levels and overall composite knowledge scores. We did find that Vietnamese women were modestly more likely to report having heard of HBV than Vietnamese men.

Although overall composite knowledge scores did not differ between Vietnamese men and women in our survey, we did find differences in knowledge about specific HBV transmission routes. Women were more likely than men to correctly identify close household contact through eating pre-chewed food, sharing toothbrushes, and sharing razors as routes for hepatitis B transmission. However, women were also less likely to know that eating food prepared by an infected person and coughing are not potential HBV transmission routes. It is possible that these discrepant results are a result of a desirability response bias (i.e., women may be more likely than men to provide the responses they think interviewers want to hear).

Our study has several important strengths, including the use of population-based sampling methods, face-to-face administration of the survey, and high response rates. However, we also acknowledge several limitations. First, we recruited households in an area of Seattle with a high proportion of Vietnamese residents. Our findings may not be applicable to Vietnamese who live outside of cities or in communities with small Asian American populations. Second, only households with listed telephone numbers associated with complete address information were eligible for the survey; it is unclear to what extent such households are representative of Seattle's Vietnamese community. Third, survey respondents may have had different knowledge levels and preventive behavior patterns than those who were unreachable or refused participation. Last, hepatitis B testing self-reports may be faulty due to inaccurate recall,

desirability bias, or confusion about the purpose of blood tests for liver dysfunction. Therefore, we believe our study likely over-estimates HBV testing rates among Vietnamese American men and women.

We speculate that the higher than expected levels of awareness and knowledge of HBV infection among our Vietnamese American respondents may be a result of recent local and national educational campaigns (conducted by such groups as the National Task Force on Hepatitis B for Asians and Pacific Islanders and Stanford University's Jade Ribbon Campaign).^{36,37} Nonetheless, one-third of survey participants (33%) did not report previous serologic testing for HBV, and only 62% of those less than 35 years of age (likely the group at highest risk for infection through sexual intercourse) reported having been tested for HBV. Less than three-quarters knew that HBV can be transmitted by eating pre-chewed food (71%), during sexual intercourse (69%), and by sharing toothbrushes (72%) and razors (63%). Few of those surveyed knew that HBV is not spread by eating food prepared by an infected person (36%) nor through coughing (31%).

These data suggest that some Vietnamese Americans may be confusing hepatitis B transmission with other communicable diseases such as hepatitis A and tuberculosis; educational campaigns in Vietnamese immigrant communities should clarify these different diseases and address knowledge deficits found in our survey. We found several differences in knowledge between men and women about specific routes of HBV transmission, suggesting additional benefit in further tailoring educational messages to male and female Vietnamese American audiences. Our findings confirm the need for continued efforts to develop and implement specifically-targeted educational campaigns focused upon reducing the disparately high burden of chronic hepatitis B infection and liver cancer disease in Vietnamese immigrant communities.

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TABLE 1

Demographic Characteristics of Study Sample

<i>Characteristic</i>	<i>Men (N=345) n (%)</i>	<i>Women (N=370) n (%)</i>	<i>p-value</i> [*]	<i>Total (N=715) n (%)</i>
<i>Age (years)</i>				
<35	93 (27)	114 (31)	0.391	207 (29)
35–49	122 (35)	124 (34)		246 (35)
≥50	130 (38)	130 (35)		260 (36)
<i>Marital status</i>				
Currently married	274 (79)	298 (81)	0.179	572 (80)
Previously married	14 (4)	24 (6)		38 (5)
Never married	57 (17)	48 (13)		105 (15)
<i>Education (years)</i>				
<12	79 (23)	179 (49)	<0.001	258 (36)
12	111 (32)	98 (27)		209 (29)
>12	154 (45)	88 (24)		242 (34)
<i>Length of time in US (years)</i>				
<10	132 (38)	176 (48)	<0.001	308 (43)
10–19	150 (43)	148 (40)		298 (42)
≥20	63 (18)	44 (12)		107 (15)
<i>English proficiency</i>				
Speaks fluently or well	81 (24)	54 (15)	<0.001	135 (19)
Speaks quite well	91 (26)	79 (21)		170 (24)
Does not speak well or at all	172 (50)	237 (64)		409 (57)

* p-Value for bivariate comparison between men and women.

TABLE 2
Hepatitis B Awareness and Testing by Demographic Characteristics (*N* = 715)

<i>Characteristic</i>	<i>Heard of Hepatitis B</i>		<i>p-Value</i> *	<i>Tested for Hepatitis B</i>		<i>p-Value</i> **
	<i>n</i>	<i>%</i>		<i>n</i>	<i>%</i>	
<i>Gender</i>						
Male	261	76	0.002	229	66	0.532
Female	317	86		253	68	
<i>Age (years)</i>						
<35	155	75	0.013	129	62	0.009
35–49	201	82		158	64	
≥50	220	85		194	75	
<i>Marital status</i>						
Currently married	473	83	0.061	394	69	0.181
Previously married	31	82		26	68	
Never married	74	70		62	59	
<i>Education (years)</i>						
<12	199	77	0.199	160	62	0.119
12	175	84		145	69	
>12	200	83		175	72	
<i>Length of time in US (years)</i>						
<10	258	84	0.047	213	69	0.254
10–19	227	76		191	64	
≥20	92	86		76	71	
<i>English proficiency</i>						
Speaks fluently or well	103	76	0.323	87	64	0.298
Speaks quite well	140	82		123	72	
Does not speak well or at all	335	82		272	67	

* p-Value for comparing the proportion who had heard of hepatitis B across the categories of each row variable (e.g., gender).

** p-Value for comparing the proportion who had been tested for hepatitis B across the categories of each row variable (e.g., gender).

TABLE 3

Knowledge about Hepatitis B Transmission

Variable	Correct Answer	Men (N=345)		Women (N=370)		p-Value*	Total (N=715)	
		Correctly Answered n (%)	Correctly Answered n (%)	Correctly Answered n (%)	Correctly Answered n (%)			
Can be spread by eating food prepared by an infected person	No	157 (46)	101 (27)	<0.001	258 (36)			
Can be spread by eating food pre-chewed by an infected person	Yes	225 (65)	281 (76)	0.001	506 (71)			
Can be spread by coughing	No	133 (39)	92 (25)	<0.001	225 (31)			
Can be spread by holding hands	No	269 (78)	265 (72)	0.035	534 (75)			
Can be spread during sexual intercourse	Yes	244 (71)	250 (68)	0.290	494 (69)			
Can be spread during childbirth	Yes	278 (81)	314 (85)	0.122	592 (83)			
Can be spread by sharing toothbrushes	Yes	232 (67)	284 (77)	0.003	516 (72)			
Can be spread by sharing razors	Yes	203 (59)	248 (67)	0.014	451 (63)			
Can be spread by lancet therapy	Yes	216 (63)	256 (69)	0.053	472 (66)			
Is more easily spread than AIDS	Yes	59 (17)	77 (21)	0.131	136 (19)			
Can be spread by someone who looks and feels healthy	Yes	281 (81)	276 (75)	0.019	557 (78)			

* p-Value for comparing the proportion correctly answered between men and women.