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Hepatitis B testing among Vietnamese American men

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Abstract

Vietnamese American men are over 10 times more likely to be diagnosed with liver cancer than their white counterparts. This health disparity is attributable to high rates of hepatitis B virus (HBV) infection. Our study objective was to examine factors associated with HBV testing among Vietnamese men. A population-based survey was conducted in Seattle. The questionnaire content was guided by an earlier qualitative study and the Health Behavior Framework. The survey was completed by 345 men (response rate: 80%). About one-third (34%) of the respondents reported they had not been tested for HBV. The following factors were associated ($P < 0.01$) with previous testing in bivariate comparisons: having a regular source of care and regular provider; knowing that HBV can be spread during childbirth; believing HBV can cause liver cancer; and doctor(s) had recommended testing as well as had asked doctor(s) for testing. Three variables were independently associated with HBV testing in a logistic regression model: regular source of care (OR = 4.5; 95% CI = 2.6–7.9), physician recommendation (OR = 2.3, 95% CI = 1.3–4.0), and knowing HBV can be spread during childbirth (OR = 2.1; 95% CI = 1.2–3.9). Low levels of HBV testing remain a public health problem in some Vietnamese American sub-groups. Health education about HBV transmission may stimulate patients to seek testing. Intervention programs should specifically target Vietnamese men without a regular source of health care and physicians who serve Vietnamese communities.

Keywords

Health behavior framework; Hepatitis B testing; Immigrant health; Liver cancer; Vietnamese Americans

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1. Introduction

Vietnamese immigrants came to North America in three waves. The first wave occurred in 1975, following the fall of Saigon, while the second wave started in 1979 as political turmoil escalated in Southeast Asia. Finally, the third wave of immigrants began in 1989 when the Vietnamese government began allowing emigration under the auspices of the Orderly Departure Program and Family Reunification Program [1]. In 2000, the United States (US) Census documented 1.1 million Vietnamese Americans [2]. Because of continued immigration and high fertility rates, there will be an estimated four million Vietnamese in the US by 2030, and they will soon constitute the second largest Asian sub-group [3,4]. Compared to the general Asian American population, Vietnamese are economically disadvantaged, linguistically isolated, and particularly unfamiliar with Western culture [5,6].

While hepatocellular carcinoma (HCC) is an uncommon tumor among individuals born in the US, it is the most common malignancy in many Asian countries [7,8]. About 80% of HCCs among Asian immigrants are etiologically associated with hepatitis B virus (HBV) infection [8,9]. Male:female HCC incidence ratios are heavily biased toward men; the reasons for this gender discrepancy are not resolved, but may include a greater likelihood of developing chronic HBV infection and androgenic steroids [10]. The rate of chronic hepatitis B infection among Vietnamese Americans is over 10%, compared to the general population rate of <1% [11,12]. Further, cancer registry data show that Vietnamese men are over 10 times more likely to be diagnosed with liver cancer than their non-Latino White counterparts, and liver cancer is the second most common malignancy in this group [13,14].

Exposure to HBV often results in a self-limiting infection that can be asymptomatic or present as acute hepatitis, usually followed by immunity [7]. 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 HCC as well as chronic active hepatitis and cirrhosis [7,15,16]. In 1986, a National Institutes of Health Clinical Conference Panel concluded that patients with chronic HBV infection should be screened (with serum testing for liver tumor markers and radiologic imaging techniques) for HCC at least once a year [7]. Additionally, chronically infected individuals should be considered for treatment with lamivudine, interferon, adefovir, liver transplantation, and new drug therapies as they become available [16–21].

In Southeast Asian communities, there is evidence that horizontal transmission is responsible for a substantial number of new cases of hepatitis B infection among the family members of chronically infected individuals [22–25]. Additionally, those who are sexually active with other Southeast Asians are at risk of infection [26]. Vaccines that are effective in preventing hepatitis B infection have been available since 1981 [26–28]. Consequently, the vaccination of young adults from areas of high HBV endemicity (e.g., Vietnam) and family members of individuals with chronic HBV infection has become part of routine clinical practice.

Liver cancer control intervention programs for Vietnamese communities should include routine HBV serologic testing to identify chronically infected individuals as well as susceptible individuals (who are at risk of infection) [16]. While there is little published information about the hepatitis B testing behavior of Vietnamese Americans, it is of note that one 1992 California study found that only 24% of Vietnamese adults had been serologically tested for HBV [29]. Our project, Cancer Control in a Vietnamese American Population, aims to collect qualitative and quantitative information about the liver cancer prevention behavior of Vietnamese men as well as design and evaluate a culturally appropriate liver cancer control outreach program. We collaborate with a coalition of Vietnamese community members which provides invaluable

input on planning and implementation. As part of this project, we conducted a population-based survey in Seattle, Washington during 2002. Our goal was to obtain information about hepatitis B testing barriers and facilitators that could be used to develop intervention strategies for Vietnamese American men. In this analysis, we used our survey data to examine variables associated with previous hepatitis B testing.

2. Methods

2.1. Sampling methods

Census data indicate that Seattle's Vietnamese community is concentrated in the southern part of the city [30]. 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 [31]. We applied this list of names to the 2001 telephone book for metropolitan Seattle. Specifically, we identified 1639 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. This sample size determination was based on our previous experience conducting surveys in Asian American communities and available project resources. As nine of these addresses were subsequently found to be duplicates, the final study sample included 593 households.

2.2. Household recruitment

Our study procedures were approved by the University of Washington Institutional Review Board. 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 (JCJ). Interviews were conducted in participants' homes by bilingual, bicultural, male 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 min to complete.

2.3. Participant selection

We aimed to interview one man aged 18–64 years in each household. Our Vietnamese community coalition believed that the survey response rate 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. However, to ensure our sample was representative of different age-groups, we randomly assigned households to one of the two groups: households where we initially asked to speak with a man in the 18–39 age-group (and then asked to speak with a man aged 40–64 if there were no men in the younger age-group); and those where we initially asked to speak with a man in the 40–64 age-group (and then asked to speak with a man aged 18–39 if there were no men in the older age-group).

2.4. Survey development

Eyton and Neuwirth have suggested that qualitative methods should routinely be applied during the development of survey instruments for Vietnamese [32]. Our survey development was guided by an earlier qualitative study, our research group's previous experience conducting surveys in Asian American communities, and the Health Behavior Framework (formally known as the Adherence Model) [33–37]. We chose to use the Health Behavior Framework as

our conceptual framework because it is very comprehensive. Unlike more limited theoretical models, it allows different variables to emerge as predictors of behavior in different population sub-groups [33,34]. Further, Health Behavior Framework variables have been found to be associated with behavior in racial/ethnic minority populations, including Asian Americans [38,39]. The survey instrument was developed in English, translated into Vietnamese, back-translated to ensure lexical equivalence, reconciled, and pre-tested [32].

2.5. Survey content

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.” Men 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. This study focused on factors associated with hepatitis B testing. However, those who reported having received hepatitis B testing were asked about their test result. Additionally, men who reported having had a negative hepatitis B test were asked whether they had been vaccinated against the disease.

Survey participants were queried about their age, marital status, educational level, and household income. Respondents also specified how many years they had lived in the US; provided information about their English-language proficiency; and indicated whether they had health insurance, a regular source of care, and a regular provider. Our qualitative study indicated the following Health Behavior Framework categories were potentially relevant to hepatitis B testing among Vietnamese men: fatalism, perceived susceptibility to disease, perceived effectiveness of testing, knowledge, perceived severity of disease, barriers to testing, social support, and communication with provider. Individual Health Behavior Framework questions are shown in Table 1. As some Vietnamese immigrants have little formal education, we made the response options for our Health Behavior Framework items as simple as possible. Specifically, the response options were yes, no and not sure/don’t know.

2.6. Data analysis

We compared the characteristics of men who reported HBV serologic testing and those who had not been tested. Answers to items with response options of yes, no, and not sure/don’t know were dichotomized into yes versus other. Proportion of life in the US (which is considered to be a good surrogate of acculturation) was calculated from responses to questions about current age and years in the US [40]. The chi-square test was used to assess statistical significance in bivariate comparisons [41]. We used an unconditional logistic regression model to summarize the independent effect of individual items on HBV testing adherence [42]. As a tool to build a summary model relevant to intervention planning, we used a forward selection method; that is, we entered the most important variables (in terms of deviance change) sequentially into our model until no other variable changed the deviance significantly [43].

3. Results

3.1. Survey response

The questionnaire was completed by 345 men. The disposition of the remaining 248 addresses in the original sample was as follows: not a residential address (i.e., vacant dwelling or business) –25, eligibility not established (i.e., no contact after five attempts) –22, verified to be ineligible (i.e., household not Vietnamese or no Vietnamese man aged 18–64 years) –131, and eligible but refused –70. The overall estimated responses rate was 80% (assuming the proportion of eligible households was the same among those that were and were not

contactable) and the cooperation rate (i.e., response among reachable and eligible households) was 83%. Three hundred and thirty-eight (98%) of the respondents completed the survey in Vietnamese.

3.2. Study group characteristics

All the men who participated in our survey were born in Southeast Asia. The study group characteristics are given in Table 1. About one-third of the respondents were in each of the following age-groups: <35 years (27%), 35–49 years (35%), and 50 years or older (38%). Seventeen percent had never been married, 77% had at least a high school education, and 28% reported an annual household income of <US\$ 20,000. About one-half (46%) of the study group had spent <25% of their life in the US and only 24% spoke English fluently or well. The majority had health insurance (86%), a regular source of health care (78%), and a regular provider (73%).

3.3. Hepatitis B knowledge and beliefs

Approximately three-quarters (76%) of the study sample had heard of hepatitis B before being given a description of the disease. Only one-half (50%) of the survey participants thought that Vietnamese are more likely to be infected with HBV than whites. Nearly all (96%) believed hepatitis B disease can be treated better if detected early. The proportions who knew hepatitis B can be spread by sexual intercourse, childbirth, and someone who looks and feels healthy were 71, 81, and 81%, respectively. Less than one-half (43%) of the men believed people with hepatitis B can be infected for life. Finally, most respondents believed that hepatitis B can cause liver cancer (83%) and people can die from HBV (93%) (Table 1).

3.4. Hepatitis B testing

Two-thirds (66%) of the Vietnamese men who completed our survey reported they had been tested for hepatitis B. Bivariate comparisons between the 229 men who had been tested and the 116 men who had not been tested are given in Table 1. The following variables were associated ($P < 0.05$) with HBV testing in bivariate comparisons: older age; having a regular source of care and regular provider; not thinking illness is a matter of karma/fate; having family members who were chronically infected with hepatitis B; knowing that hepatitis B can be spread by sexual intercourse and childbirth, and by someone who looks and feels healthy; believing HBV can cause liver cancer and people can die from hepatitis B; thinking blood tests can deplete the body of energy; and doctor(s) had recommended Pap testing as well as had asked doctor(s) for Pap testing. As shown in Table 2, the following variables were independently associated with hepatitis B testing in the stepwise logistic regression model: having a regular source of care, previous physician recommendation, and knowing that HBV can be spread during childbirth.

3.5. Hepatitis B test results and vaccination

Among the men who reported hepatitis B testing, nine (4%) indicated they were chronically infected, 12 (5%) indicated they were immune to disease (i.e., had been exposed to hepatitis B, but were not chronically infected), and 196 (86%) indicated they were susceptible to disease (i.e., had never been exposed to HBV); the remaining 12 (5%) respondents did not know their test result. One hundred and thirty-nine (71%) of those who had been tested and found to be susceptible to HBV infection reported they had been vaccinated against the disease.

4. Discussion

We found that rates of serological testing for hepatitis B among Vietnamese American men (66%) were considerably higher than those reported by Cambodian women (38%) in an earlier Seattle study [36]. This discrepancy may reflect the success of a recent hepatitis B education program targeting Asian Americans in the Seattle area and/or over-reporting of hepatitis B testing among Vietnamese men. However, while the overall rate of hepatitis B testing was relatively high in our study, testing rates among certain sub-groups of Vietnamese men (e.g., those without a regular source of care) remained low.

Jenkins et al. surveyed Vietnamese adults in Texas and Washington DC during 1998 [44]. In general, levels of knowledge among our participants were higher than those reported by Jenkins and his colleagues. For instance, 83% of the Seattle men believed that hepatitis B can cause liver cancer compared to 65 and 63% of respondents in Dallas and Washington, DC, respectively. Nonetheless, our study identified some important knowledge deficits with respect to HBV susceptibility, transmission, and sequelae. For example, only 50% of the respondents thought that Vietnamese are at higher risk of hepatitis B infection than whites, nearly one-third (29%) did not know HBV can be sexually transmitted, and over one-half (57%) did not believe that people with hepatitis B can be infected for life. Additionally, knowledge about routes of transmission and consequences of chronic infection were associated with HBV testing in bivariate comparisons.

Several studies have shown that Vietnamese American women with a regular source of care are more likely to be adherent to breast and cervical cancer screening guidelines [45,46]. We found that 22% of the Vietnamese men who responded to our survey did not have a regular source of care. Further, only 37% of those without a regular source of care had been tested for HBV. Our research group has previously reported a strong association between physician recommendations and Pap testing receipt among Cambodian women in Washington, as well as Vietnamese women in California and Texas [35,37]. It is of note that, among our participants, only one-third (33%) had ever received a physician recommendation for HBV testing. Additionally, men who had received a physician recommendation had a 2.3 times higher odds of having been tested than those who had not received a physician recommendation.

Published data indicate about 40% of Asian immigrants to North America have serologic evidence of past hepatitis B infection (i.e., are either immune to disease or chronically infected), and about 60% remain susceptible to infection [47–49]. Approximately 10% of Asian immigrants are chronically infected, compared to less than 1% of the general US population [50,11,47,51,48,49]. Additionally, a recent study indicated that <40% of Vietnamese children and adolescents have received the hepatitis B vaccine [52,53]. The self-reports of Vietnamese men in this study were inconsistent with these previous findings, and may indicate a lack of understanding about hepatitis B test results and vaccination.

There are few publications addressing liver cancer control interventions in Asian American communities. However, McPhee and Nguyen used pre- and post-intervention surveys in an experimental and a control community to evaluate a media-based community outreach campaign targeting Vietnamese Americans. Following a 1-year intervention, hepatitis B serologic testing among adults increased from 24 to 48%, and childhood HBV vaccination rates increased 20% points in the experimental community [29]. As part of our project, Cancer Control in a Vietnamese American Population, we will evaluate the acceptability, feasibility, and effectiveness of a home-based hepatitis B educational session delivered by bilingual and bicultural Vietnamese outreach workers. This intervention will refer men without a regular

source of care to local community clinics, empower men to ask their physicians for HBV testing, and provide education about HBV transmission.

Our study has several strengths. Specifically, we used population-based sampling methods, administered the survey face-to-face, and had a high response rate. However, there are also several limitations. First, we recruited households in areas of Seattle with a relatively high proportion of Vietnamese residents. Our findings may not be generalizable to other geographic areas or Vietnamese who live 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 [54]. Third, survey respondents may have had different demographic characteristics and preventive behavior patterns than those who were unreachable or refused participation [55]. Last, self-reports may be faulty due to inaccurate recall, desirability bias, or confusion about the purpose of blood tests for liver dysfunction. Therefore, our study probably over-estimates HBV testing rates among Vietnamese American men. Future studies should address the accuracy of self-reported hepatitis B testing by comparing self-reports with medical records data.

Potentially important variables, such as the country where hepatitis B testing was performed (i.e., Vietnam versus the US) and the race/ethnicity of primary care providers (i.e., Vietnamese versus other) were not included in our analysis of factors associated with hepatitis B testing. In addition, future research might usefully address the management of chronic hepatitis B carriers. For example, there is little information about the proportion of surface antigen positive Vietnamese men who are chronically infected, the proportion of chronically infected Vietnamese men who are candidates for anti-HBV medications, the proportion of Vietnamese men who will have liver cancer prevented because they receive anti-HBV medication, the proportion of eligible Vietnamese men who actually receive anti-HBV medication, and barriers to receipt of anti-HBV medications among those who would benefit from such treatment.

Jenkins and colleagues have called on cancer control agencies, such as the National Cancer Institute, to take a leadership role in raising awareness about the role of HBV in the etiology of liver cancer. They also recommended that cancer control agencies provide education about potential routes of hepatitis B transmission; and promote HBV serologic testing of all adults from geographic areas of high endemicity, immunization of susceptible individuals, and routine monitoring of chronically infected persons [16]. Our study demonstrates that low levels of hepatitis B testing remain a significant public health problem in some Vietnamese American sub-groups. One important finding was the low proportion (33%) of respondents who reported a previous physician recommendation for hepatitis B testing. Health education about HBV transmission and the health consequences of chronic infection may stimulate patients to seek testing. Intervention programs should specifically target Vietnamese men without a regular source of care (e.g., by offering free screenings at health fairs and Vietnamese community gatherings) and physicians who serve Vietnamese populations.

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Table 1

Factors associated with Hepatitis B serologic testing

Variable	n (%)	Tested for HBV (%)	P-value
Sociodemographic			
Age (years)			
<35	93 (27)	58	0.02
35–49	122 (35)	63	
≥50	130 (38)	75	
Marital status			
Currently married	274 (79)	69	0.11
Previously married	14 (4)	71	
Never married	57 (17)	54	
Education (years)			
<12	79 (23)	57	0.06
12	111 (32)	65	
≥12	154 (45)	72	
Household income (US\$)			
<20,000	98 (28)	66	0.53
≥20,000	203 (59)	68	
Unknown	44 (13)	59	
Acculturation			
Proportion of life in US (%)			
<25	157 (46)	73	0.06
25–49	140 (41)	63	
≥50	48 (14)	56	
English proficiency			
Speaks fluently or well	81 (24)	60	0.37
Speaks quite well	91 (26)	70	
Does not speak well or at all	172 (50)	67	
Health care			
Health insurance			
Yes	298 (86)	68	0.08
No	47 (14)	55	
Regular source of care			
Yes	269 (78)	75	<0.001
No	75 (22)	37	
Regular provider			
Yes	250 (73)	76	<0.001
No	93 (27)	42	
Fatalism			
Thought illness is a matter of karma or fate			
Yes	58 (17)	55	0.048
No	287 (83)	69	
Perceived susceptibility			
Thought Vietnamese are more likely to be infected with hepatitis B than Whites			
Yes	173 (50)	69	0.34
No	172 (50)	64	
Family members are chronically infected with hepatitis B			
Yes	22 (6)	86	0.04
No	322 (94)	65	
Perceived effectiveness			
Believed hepatitis B disease can be treated better if detected early			
Yes	332 (96)	67	0.33
No	13 (4)	54	
Knowledge			
Knew that hepatitis B can be spread during sexual intercourse			
Yes	244 (71)	70	0.02

Variable	n (%)	Tested for HBV (%)	P-value
No	100 (29)	57	
Knew that hepatitis B can be spread during childbirth			
Yes	278 (81)	70	0.002
No	66 (19)	50	
Knew that hepatitis B can be spread by someone that looks and feels healthy			
Yes	281 (81)	69	0.03
No	64 (19)	55	
Perceived Severity			
Believed people with hepatitis B can be infected for life			
Yes	149 (43)	68	0.48
No	196 (57)	65	
Believed hepatitis B can cause liver cancer			
Yes	286 (83)	70	0.002
No	59 (17)	49	
Believed people can die from hepatitis B			
Yes	322 (93)	68	0.02
No	23 (7)	43	
Barriers			
Thought people with hepatitis B are sometimes avoided by others			
Yes	136 (39)	68	0.69
No	209 (61)	66	
Thought blood tests can deplete the body of energy			
Yes	36 (10)	50	0.03
No	309 (90)	68	
Social support			
Family member(s) had suggested hepatitis B testing			
Yes	70 (20)	76	0.06
No	275 (80)	64	
Friend(s) had suggested hepatitis B testing			
Yes	40 (12)	78	0.11
No	305 (88)	65	
Communication with Provider			
Doctor(s) had recommended hepatitis B testing			
Yes	112 (33)	79	<0.001
No	232 (67)	60	
Had asked doctor(s) for hepatitis B testing			
Yes	76 (22)	80	0.004
No	269 (78)	62	

Table 2

Logistic regression results

Variable	OR	95% CI	P-value
Regular source of care	4.5	2.6–7.9	<0.001
Knew that hepatitis B can be spread during childbirth	2.1	1.9–3.9	0.01
Doctor(s) had recommended hepatitis B testing	2.3	1.3–4.0	0.004