Hepatitis B Knowledge and Practices Among Chinese Canadian Women in Vancouver, British Columbia

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ABSTRACT

Introduction: Liver cancer rates are higher in North American Chinese than non-Asian ethnic/racial groups, largely due to chronic hepatitis B virus (HBV) infection.

Methods: A community-based survey of Chinese women (n = 147) was completed during 1999 to examine HBV knowledge and practices in Vancouver, British Columbia.

Results: Most women had heard of HBV (85%) but smaller proportions knew about some routes of transmission (e.g., sexual intercourse) and sequelae of infection. Knowledge about HBV was significantly associated with education level (p=0.005), English fluency (p<0.001) and household income (p=0.007). Previous serologic testing for HBV infection was significantly associated with education level (p=0.04), English fluency (p=0.01), and level of knowledge about HBV (p<0.001).

Conclusions: Efforts to increase knowledge about HBV infection in this community should consider targeting less educated and less acculturated individuals.

La traduction du résumé se trouve à la fin de l'article.

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Immigrants of Chinese descent form an increasing proportion of the Canadian population. It is estimated that over 8% of the population of British Columbia (BC) are now of Chinese origin, most of them born in East Asian countries (i.e., mainland China, Hong Kong or Taiwan).[1] Hepatocellular carcinoma (HCC) is the most common malignancy in many Asian countries,[2,3] and immigrants to North America and their offspring remain at increased risk compared to whites.[4,5] Indeed, the incidence of HCC among Chinese men in some areas of North America exceeds 20 per 100,000 as compared to 3.7 per 100,000 among non-Latino whites.[6] Although HCC predominantly affects males, Chinese women in North America also have a markedly elevated incidence of HCC.[7]

Worldwide, the most important etiological factor associated with HCC is chronic infection with hepatitis B virus (HBV), which is responsible for about 80% of all cases of HCC.[8] HBV infection is highly endemic in many Asian countries,[9] and evidence of past infection is found in up to 65% of immigrants from some regions.[10,11] Moreover, approximately 4.3% of all immigrants to Canada are chronic carriers of HBV – this rises to over 15% in some immigrants from Asia.[10,12-14] In low endemicity regions such as Canada, the majority of new cases of HBV are found in young adults in whom transmission is primarily sexual or as a result of lifestyle choices.[15,16] However, household transmission from infected family members also appears to be an important route in certain immigrant groups.[17-20]

Prevention of HCC relies on both serologic screening to identify chronic carriers of HBV as well as HBV vaccination of those lacking immunity. Clearly, health promotion programs for immigrants need to be targeted and based on a thorough understanding of their knowledge, beliefs and cultural practices regarding HBV infection.[21] We recently conducted a community-based survey of Chinese women in Vancouver, BC. This paper presents the respondents' knowledge and practices regarding HBV infection. In addition, we describe relationships between the participants' sociodemographic characteristics and their levels of knowledge, as well as their self-reported serologic testing history.

MATERIALS AND METHODS

Study sample

Our study procedures were approved by the University of British Columbia's Behavioural Research Ethics Board. Previous community-based surveys of Asian minorities have validated the technique of using surnames to identify Asian households.[22,23] We identified a list of 178 Chinese surnames from multiple sources including published articles, cancer registry data, telephone books and data from the Screening Mammography Program of BC. Neighbourhoods in Metropolitan Vancouver with high proportions of Chinese residents were selected: Old "Chinatown" (60% Chinese), East Vancouver (36% Chinese) and Richmond (33% Chinese) (Statistics Canada. Unpublished data. Ottawa, Canada 1996). The list of surnames was used to identify randomly selected households in these areas from the 1998 Vancouver telephone book.[24] In total, 1,900 households were identified to be approached for interview. The HBV knowledge and practices survey was a component of a larger survey that aimed to examine multiple preventive behaviours in Chinese women (e.g., Papanicolaou testing, mammography and dietary practices). In order to minimize participant burden, study households were randomly assigned to one of three versions of our study instrument addressing different preventive behaviours. One sixth of the sample were asked to complete the version that included HBV questions.

Survey instrument

The majority of the survey questions were taken or adapted from survey instruments recently used to evaluate childhood HBV immunization projects funded by the Centers for Disease Control and Prevention.[25] The interviewers asked women to recall whether they had ever been serologically tested for HBV, the outcome of this test and whether or not they had received immunization for HBV (if susceptible to disease). A series of 12 questions queried respondents' knowledge about HBV infection, including its modes of transmission, as well as possible sequelae of infection. Finally, the questionnaire included sociodemographic and acculturation questions. The questionnaire was developed in English, translated into Chinese, then back-translated to ensure lexical equivalence, reconciled and pre-tested.[26]

TABLE I

Summary of Survey Responses

Household Response Category	(N = 1,900) n	(%)
Not a residential address*	74	–
Eligibility not established†	209	–
Verified to be ineligible‡	300	–
Refused	495	–
Participated	822	–
Estimated proportion of eligibles among households where eligibility was not established (D + E)/(C+D+E)	–	81%
Estimated number of eligibles among households where eligibility was not established (F x B)	169	–
Estimated total household response rate E / (D + E + G)	–	55%
Response rate among reachable and eligible households E / (D + E)	–	62%

* Vacant dwelling or business address
† No contact after five attempts or unable to access secure building
‡ Household not Chinese; household Chinese but no Chinese woman 20 or older; household does not speak Cantonese, Mandarin, or English; or, health problems

TABLE II

Characteristics of Study Group (N = 822)

Variable		Version 1 (N=544) n (%)	Version 2 (N=147) n (%)	Version 3 (N=131) n (%)	P-value†
Age (years)	< 40	147 (28)	36 (25)	36 (29)	0.935
	40-59	251 (47)	72 (50)	56 (45)	
	≥ 60	135 (25)	37 (26)	33 (26)	
Education (years)	< 6	65 (12)	11 (8)	14 (11)	0.340
	6-11	167 (31)	53 (36)	48 (37)	
	≥ 12	309 (57)	82 (56)	67 (52)	
Income* (Canadian $)	< $20,000	116 (31)	36 (36)	39 (42)	0.117
	$20,000-$29,999	87 (23)	24 (24)	24 (26)	
	≥ $30,000	174 (46)	40 (40)	29 (32)	
Type of housing	Owned	461 (87)	119 (81)	103 (82)	0.117
	Other	70 (13)	28 (19)	23 (18)	
Religion	Buddhism	149 (28)	32 (22)	36 (28)	0.304
	Christianity	146 (27)	33 (23)	33 (25)	
	None	245 (45)	81 (55)	61 (47)	
Marital status	Currently	437 (80)	122 (83)	102 (78)	0.817
	Previously	64 (12)	17 (12)	18 (14)	
	Never	43 (8)	8 (5)	10 (8)	
Birthplace	Mainland China	266 (49)	76 (52)	77 (59)	0.113
	Other Asian country	268 (49)	65 (44)	51 (39)	
	North America	10 (2)	6 (4)	3 (2)	
Proportion of life in North America (%)	< 25	256 (48)	73 (50)	55 (43)	0.702
	25-49	192 (36)	47 (32)	49 (38)	
	≥ 50	86 (16)	27 (18)	24 (19)	
English fluency	Yes	194 (36)	56 (38)	46 (35)	0.849
	No	350 (64)	91 (62)	84 (65)	

* Data on household income were missing for 253/822 (31%) of respondents.
† P-value to test homogeneity of variables among the three versions of the survey. Version 2 focused on hepatitis B knowledge and practices.

Survey recruitment/Data collection

The study was advertised in the Greater Vancouver Chinese community through radio announcements as well as print media and households selected for the survey were sent an introductory letter in Chinese and English. The interviews were conducted in respondents' homes by trilingual (Cantonese, Mandarin and English) female Chinese interviewers. Chinese women were eligible if they were age 20 years or older and able to speak Cantonese, Mandarin or English. If a household included two or more eligible women, the oldest woman was asked to participate in the survey.

TABLE III

Responses to Hepatitis B Knowledge Questions (N = 147)

Question (correct response)	Correct Response n (%)
Which do you think is more easily spread from person to person, hepatitis B or HIV? (hepatitis B)	87 (59)
If someone is infected with hepatitis B but they look and feel healthy, do you think that person can spread hepatitis B? (Yes)	100 (68)
Do you think hepatitis B can be spread from person to person by eating food prepared by an infected person? (No)	60 (41)
Do you think hepatitis B can be spread from person to person by sharing a toothbrush with an infected person? (Yes)	127 (86)
Do you think hepatitis B can be spread from person to person by eating food that has been pre-chewed by an infected person? (Yes)	120 (82)
Do you think hepatitis B can be spread from person to person by being coughed on by an infected person? (No)	36 (25)
Do you think hepatitis B can be spread from person to person by having sexual intercourse with an infected person? (Yes)	82 (56)
Do you think hepatitis B can be spread from person to person by holding hands with an infected person? (No)	105 (71)
Do you think people with hepatitis B can be infected for life? (Yes)	57 (39)
Do you think hepatitis B can cause liver cancer? (Yes)	90 (61)
Do you think someone can die from hepatitis B? (Yes)	113 (77)
Do you think hepatitis B disease can be cured? (No)	37 (25)

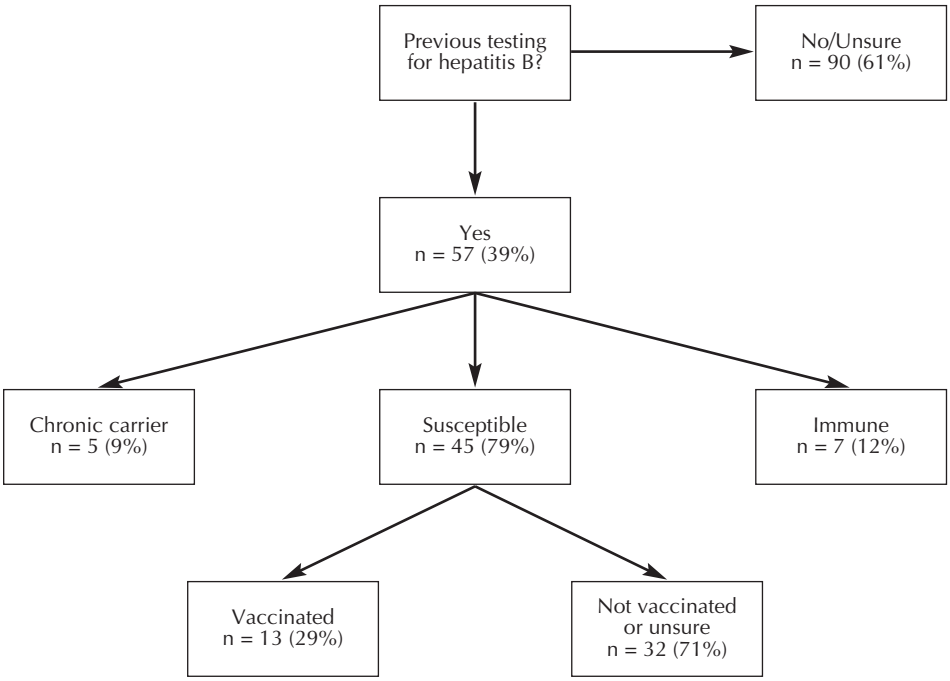

Figure 1. Summary of hepatitis B testing and vaccination (N = 147)

Data analysis

The main outcome variables were level of knowledge about HBV, and previous serologic testing. A summary score of knowledge was computed by summing correct responses to the 12 knowledge questions (the maximum possible score was therefore 12). This score was dichotomized as 'high' (7 or more correct answers) or 'low' (6 or fewer correct answers).

Bivariate associations between the outcome and sociodemographic and acculturation factors were examined using the chi-square test and, where necessary, Fisher's exact test.[27] Proportion of life spent in North America, which is considered a good measure of acculturation, was calculated from responses to questions about current age and age at immigration.[28]

RESULTS

Study group

We were able to contact 1,617 households, 81% of which were verified to be Chinese family residences. The remainder were either business addresses or residences that could not be contacted (Table I). We interviewed 822 Chinese women in total for this study, which represented 62% of the reachable and eligible households; 147 women completed the version of the questionnaire that included hepatitis B items. Table II describes their sociodemographic characteristics.

Hepatitis B knowledge

Prior to being given a description of the disease, the majority (85%) of respondents had heard of HBV. Between 25% and 86% of respondents gave correct responses to each of the 12 questions addressing knowledge about the transmission and sequelae of HBV (Table III). Overall respondents correctly answered 6.9 (or 57%) of the 12 questions (SD: 2.7 or 23%). Most of the respondents knew that HBV could be transmitted by asymptomatic carriers (68%), by pre-chewed food (82%) or by sharing toothbrushes with an infected person (86%). However, only just over one half knew that HBV could be spread by sexual intercourse (56%) or that it was more easily spread than HIV (59%). Although many of the respondents knew that HBV could be fatal (77%) and cause liver cancer (61%), only small proportions knew that the infection could be lifelong (39%) or that it was usually incurable (25%).

Hepatitis B testing and vaccination

Slightly more than one third (39%) of respondents recalled ever having been tested for HBV in the past (Figure 1). Of the 57 respondents reporting being tested, 5 (9%) reported being chronic carriers, 7 (12%) were apparently immune, and 45 (79%) recalled having no evidence of previous or current infection. Less than a third (29%) of the latter group of individuals (who were susceptible to HBV infection) recalled having been vaccinated.

Bivariate associations

High levels of knowledge about HBV (i.e., respondents who correctly answered at least 7 of the 12 questions about HBV) were significantly associated with higher level of education (p=0.005), higher annual household income (p=0.007) and fluency in spoken English (p<0.001) (Table IV). Previous serologic testing for HBV was significantly associated with fluency in spoken English (p=0.01), higher level of knowledge about HBV (p<0.001), and higher level of education (p=0.04) (Table V).

Multivariate modeling

We entered seven sociodemographic and acculturation predictors (age, educational level, fluency in spoken English, type of housing, marital status, birthplace and proportion of life in North America) into a logistic regression model in order to identify factors which were independently associated with the two outcomes of interest. Only fluency in spoken English (OR 3.96, CI 1.7-9.7 p<0.005), 6-11 years of education (OR 6.3, CI 1.4-45.5, p<0.05), and 12 or more years of education (OR 5.7, CI 1.2-40.5, p<0.05) were independently associated with respondents' level of knowledge about HBV. Education level and fluency in spoken English were also significantly associated with previous serologic testing for HBV, but were not independently significant in the regression model. However, when knowledge level was included in the logistic regression model for previous serologic testing for HBV (in addition to the seven predictors noted above), we found that high level of knowledge (OR 4.8, CI 1.7-14.7, p<0.005) was in fact independently associated with previous serologic testing for HBV.

TABLE IV

Hepatitis B Knowledge in Relation to Sociodemographic and Acculturation Variables

Variable		High Knowledge† (N = 89) n (%)	Low Knowledge‡ (N = 58) n (%)	p-value
Age (years)	< 40	21 (24)	15 (26)	0.27
	40-59	48 (54)	24 (41)	
	≥ 60	20 (22)	19 (33)	
Education (years)	< 6	2 (2)	9 (16)	0.005
	6-11	31 (35)	22 (39)	
	≥ 12	56 (63)	26 (46)	
Income* (Canadian $)	< $20,000	17 (25)	19 (58)	0.007
	$20,000-$29,999	19 (28)	5 (15)	
	≥ $30,000	31 (46)	9 (27)	
Type of housing	Owned	75 (84)	44 (76)	0.20
	Other	14 (16)	14 (24)	
Marital status	Currently	77 (87)	45 (78)	0.28
	Previously	9 (10)	8 (14)	
	Never	3 (3)	5 (9)	
Birthplace	Mainland China	43 (48)	33 (57)	0.37
	Other Asian country	41 (46)	24 (41)	
	North America	5 (6)	1 (2)	
Proportion of life in North America (%)	< 25	42 (47)	31 (53)	0.28
	25-49	27 (30)	20 (34)	
	≥ 50	20 (22)	7 (12)	
English fluency	Yes	45 (51)	11 (19)	<0.001
	No	44 (49)	47 (81)	

* data on household income were missing for 47/147 (32%) of respondents
† High knowledge defined as respondents who correctly answered at least 7 of the 12 questions about HBV.
‡ Low knowledge defined as respondents who correctly answered fewer than 7 of the 12 questions about HBV.

DISCUSSION

Our results indicate that most Chinese women living in Vancouver, BC are aware of HBV infection. However, while 85% of the respondents had heard of HBV and were aware of potential sequelae of chronic infection such as liver cancer, a paradoxically small proportion (39%) knew that HBV infection could be lifelong. Most respondents recognized the possible infectivity of asymptomatic carriers, as well as putative routes of household transmission such as pre-chewed food (82%) or sharing toothbrushes with an infected person (86%). Given that sexual transmission of HBV among young adults is important in Canada,[15] it is of note that only 56% of women knew that HBV could be spread sexually. Overall, the respondents in our survey who were more highly educated and fluent in English had the greatest knowledge about HBV infection. This is most likely a reflection of sociodemographic and acculturation factors.[29,30]

HBV immunization programs were expanded in 1992 to include all children and a broader number of groups at known elevated risk of transmission.[15,31-34] This strategy appears to have contributed to the relative stability of crude reported rates of HBV in Canada (10.3 per 100,000 per year) in the early part of the 1990s,[35] despite continued immigration from areas of high HBV endemicity in Asia. Current recommendations also include serologic screening for evidence of chronic HBV infection in certain individuals, such as pregnant women and those at high risk of infection.[36] Only 39% of the respondents in our survey reported that they had received such recommended testing, and of those respondents who appeared to be susceptible to infection, only 29% recalled that they had received HBV vaccination. A report of serologic testing for HBV was clearly associated with our respondents' level of knowledge about HBV as well as their educational level in general. Clearly increased knowledge may have been due to contact with health care providers who were offering and discussing serologic testing for HBV, rather than vice versa. However, other studies which have examined participation in health screening by Asian American populations in North America have also confirmed the relative importance of sociodemographic and acculturation factors such as educational level and English fluency in predicting participation.[37-40]

Although we attempted to survey a representative sample of the Chinese population living in Vancouver, there are several potential limitations to our methodology. First, our sampling frame was based on the Vancouver telephone directory and, therefore, households without a telephone or with unlisted numbers were excluded. Second, respondents to the survey may have had higher levels of knowledge and/or serologic testing than those who chose not to participate. Third, self-reports of previous serologic testing and vaccination for HBV may be inaccurate due to faulty recall. Additionally, our survey did not include questions regarding prenatal HBV screening, or about other family members or carriers which may have been impor-

TABLE V

History of Serologic Testing for Hepatitis B in Relation to Sociodemographic and Acculturation Variables

Variable		Tested (N = 57) n (%)	Not tested (N = 90) n (%)	p-value
Age (years)	< 40	18 (32)	18 (20)	0.09
	40-59	29 (51)	43 (48)	
	≥ 60	10 (18)	29 (32)	
Education (years)	< 6	1 (2)	10 (11)	0.04
	6-11	18 (32)	35 (39)	
	≥ 12	38 (67)	44 (49)	
Income* (Canadian $)	< $20,000	15 (34)	21 (38)	0.12
	$20,000-$29,999	7 (16)	17 (30)	
	≥ $30,000	22 (50)	18 (32)	
Type of housing	Owned	44 (77)	75 (83)	0.36
	Other	13 (23)	15 (17)	
Marital status	Currently	49 (86)	73 (81)	0.70
	Previously	5 (9)	12 (13)	
	Never	3 (5)	5 (6)	
Birthplace	Mainland China	24 (42)	52 (58)	0.05
	Other Asian country	32 (56)	33 (37)	
	North America	1 (2)	5 (6)	
Proportion of life in North America (%)	< 25	28 (49)	45 (50)	0.49
	25-49	16 (28)	31 (34)	
	≥ 50	13 (23)	14 (16)	
English fluency	Yes	29 (51)	27 (30)	0.01
	No	28 (49)	63 (70)	
Knowledge score	< 7 (least knowledge)	18 (32)	40 (44)	<0.001
	7-9	21 (37)	43 (48)	
	≥ 10 (most knowledge)	18 (32)	7 (8)	

* data on household income were missing for 47/147 (32%) of respondents

tant. Fourth, hepatitis caused by agents other than HBV can present with similar symptoms, possibly causing some confusion in respondents. Finally, in households with two or more women, we chose to survey the older women who may differ from younger women.

Clearly, effective and cost-effective interventions are needed to reduce the high incidence of HBV infection and HBV-related liver cancer mortality in Asian communities in North America. Designing educational interventions and materials that are both contextually and linguistically appropriate are key factors in efforts to increase these communities' knowledge about HBV infection and compliance with recommended preventive practices.[41] Our findings suggest that the greatest success is likely to be achieved by health promotion activities that target less acculturated and less educated individuals.

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RESUMÉ

Introduction : Les taux de cancer du foie des Chinois d'Amérique du Nord sont supérieurs à ceux des groupes ethniques/raciaux non asiatiques, principalement en raison des infections chroniques à VHB (virus de l'hépatite B).

Méthode : Nous avons mené en 1999 une enquête locale auprès de Chinoises (n=147) pour étudier les connaissances et les pratiques liées au VHB à Vancouver (Colombie-Britannique).

Résultats : La plupart des femmes (85 %) avaient entendu parler du VHB, mais une moindre proportion en connaissait certaines voies de transmission (p. ex., les rapports sexuels avec pénétration) et les séquelles de l'infection. Les connaissances sur le VHB présentaient une corrélation significative avec le niveau d'instruction (p=0,005), l'aisance en anglais (p<0,001) et le revenu du ménage (p=0,007). Les tests sérologiques antérieurs pour le dépistage des infections à VHB présentaient une corrélation significative avec le niveau d'instruction (p=0,04), l'aisance en anglais (p=0,01) et le niveau de connaissances sur le VHB (p<0,001).

Conclusion : Pour accroître la connaissance des infections à VHB dans cette communauté, on pourrait cibler les personnes relativement moins instruites et moins acculturées.

Directives de rédaction de la RCSP

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