

Sociocultural factors that potentially affect the institution of prevention and treatment strategies for hepatitis B in Chinese Canadians

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BACKGROUND: Despite the availability of screening for chronic hepatitis B (CHB) infection and effective treatments now available, many at-risk individuals fail to seek appropriate medical attention.

OBJECTIVE: To identify the barriers to care for CHB infection in a Chinese Canadian community.

METHODS: A survey conducted in English or Chinese collected information from individuals with CHB infection that evaluated the level of understanding and identified the barriers that may prevent Chinese patients from undergoing monitoring, screening and/or treatment for CHB infection.

RESULTS: Among the 204 patients enrolled, common misconceptions were that sharing food transmits hepatitis B and that patients with severe disease are always symptomatic. Patients with a better understanding of hepatitis B were better educated, younger and were being followed at a tertiary care centre ($P < 0.01$ for all). Prominent barriers to health care were time, inconvenience and language difficulties. Patients under the care of family physicians who had extended office hours were less likely to cite time ($P = 0.06$) and distance ($P = 0.05$) as barriers.

CONCLUSION: Patient misconceptions that severe liver disease due to hepatitis B infection is symptomatic may factor into the unwillingness to spare the time and undergo the inconvenience associated with regular medical follow-up. Implementation of programs that increase awareness of the silent progression of CHB infection and provide culturally responsive clinics, better able to work within patients' time constraints may improve Chinese patients' access to health care.

Key Words: Asian continental ancestry group; Attitudes; Delivery of health care; Health knowledge; Health education; Hepatitis B; Practice; Stigma

Hepatitis B has infected approximately one-third of the world's population at some point during their lifetime and it is estimated that 350 million people are chronically infected (1). Each year, over four million new cases of hepatitis B infection are identified and one million people die from complications of their disease worldwide (2). China, Hong Kong and Taiwan have some of the highest prevalence rates of chronic hepatitis B (CHB) infection, at 13%, 12% and 15%, respectively (3).

Les facteurs socioculturels susceptibles de nuire à l'adoption de stratégies de prévention et de traitement de l'hépatite B chez les sino-Canadiens

HISTORIQUE : Malgré l'existence de tests de dépistage de l'infection par l'hépatite B chronique (HBC) et de traitements efficaces, de nombreuses personnes vulnérables ne font pas appel à un médecin.

OBJECTIF : Déterminer les obstacles aux soins de l'infection par l'HBC au sein d'une communauté sino-canadienne.

MÉTHODOLOGIE : Un sondage effectué en anglais ou en chinois a permis de recueillir de l'information auprès de personnes atteintes d'une infection par l'HBC pour évaluer le niveau de compréhension et de déterminer les obstacles susceptibles d'empêcher les patients chinois de profiter de la surveillance, du dépistage ou du traitement de l'infection par l'HBC.

RÉSULTATS : Parmi les 204 patients participants, les idées fausses fréquentes étaient que le partage d'aliments favorise la transmission de l'hépatite B et que les patients atteints d'une maladie grave sont toujours symptomatiques. Les patients qui comprenaient mieux l'hépatite B étaient plus éduqués, étaient plus jeunes et étaient suivis dans un centre de soins tertiaires ($P < 0,01$ pour tous). Les obstacles importants aux soins étaient le temps, le dérangement et la barrière des langues. Les patients soignés par un médecin de famille ayant de longues heures d'ouverture étaient moins susceptibles de citer le temps ($P = 0,06$) et la distance ($P = 0,05$) parmi les obstacles.

CONCLUSION : Les idées fausses des patients selon lesquelles une grave maladie hépatique causée par une infection par l'hépatite B est symptomatique peuvent expliquer en partie la réticence à prendre le temps nécessaire à un suivi médical régulier et à subir les inconvénients s'y rattachant. L'adoption de programmes pour mieux faire connaître la progression silencieuse de l'infection par l'HBC et la présence de cliniques adaptées à la culture, mieux en mesure de respecter les contraintes de temps des patients, pourraient améliorer l'accès des patients chinois aux soins de santé.

Without treatment, CHB infection leads to cirrhosis in 20% to 40% of patients (4) and this increases the risk of hepatocellular carcinoma by 100-fold (5). With appropriate treatment, the progression of hepatitis B can be delayed (6), and liver failure in those with already advanced hepatic fibrosis can be prevented and the risk of developing hepatocellular carcinoma can be reduced (7). Additionally, with successful vaccination of nonimmune household contacts and infants born to mothers with hepatitis B, the transmission of this disease can be drastically lowered (8-10).

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TABLE 1
Demographics of study subjects (n=204)

Variable	n (%)
Sex	
Male	128 (63)
Female	76 (37)
Age range, years	
Younger than 25	19 (9)
25 to 39	61 (30)
40 to 54	60 (29)
55 to 64	36 (18)
Older than 64	28 (14)
Language(s) spoken*	
English	72 (35)
Mandarin	116 (57)
Cantonese	151 (74)
Other Chinese dialect	64 (31)

*Subjects could select more than one option

Despite these medical advances, studies in Vancouver, British Columbia and Seattle, United States, have shown that up to 60% of individuals chronically infected with hepatitis B are unaware of the consequences of their infection (11-15). This may lead to delays in seeking the medical care, which can minimize complications and reduce rates of transmission. As of 2002, 1.3 million of Canada's immigrant population were from China or southeast Asia and 35% (500,000) settled in the Greater Toronto, Ontario area (16). The Toronto Western Hospital and surrounding family practitioners serve a large number of immigrants in Toronto's inner-city Chinese community. Our aim was to evaluate the baseline knowledge of this population, to assess the stigma associated with hepatitis B infection and to identify self-perceived barriers to better serve this population.

METHODS

Patients studied

The study procedures were approved by the University Health Network Research Ethics Board. Consecutive Chinese patients older than 18 years of age, identified by family physicians to have CHB infection (ie, antihepatitis B surface antigen-positive), were approached during regular visits at two family physician's offices or at the Toronto Western Hospital liver clinic between September and October of 2006. Patients recruited from family physician offices were excluded if they were cared for by another gastroenterologist or hepatologist for their hepatitis B. The present study compared the knowledge base of patients followed only by family doctors with those who were seen regularly in our tertiary referral hepatology clinic. Multilingual staff obtained informed consent from patients in English, Mandarin or Cantonese. The participants then completed a survey in English or in traditional or simplified Chinese, according to their preference.

Questionnaire administered

The survey collected demographic information, evaluated an individual's knowledge of hepatitis B, assessed the stigma they felt about being chronically infected with hepatitis B and identified self-perceived barriers to health care. The survey was designed in English and translated into Chinese and reviewed

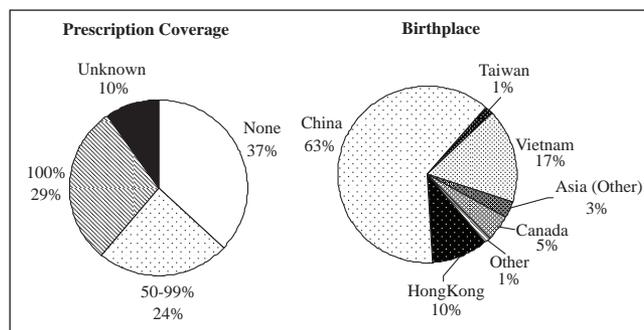


Figure 1) Demographic variables of the study population

by staff (who could read both Chinese and English) to ensure translational accuracy. Fourteen questions were used to evaluate patients' knowledge about disease transmission, complications and treatments. Some questions were taken or modified from previously published surveys (11,17,18). Stigmatization was assessed by asking patients if they were ashamed about being chronically infected with hepatitis B and by asking patients if they would share knowledge of their hepatitis B status with friends and family. Patients were also asked to rank their top three self-perceived barriers to health care.

Statistics

Both descriptive and analytical statistical analyses were performed. Student's *t* test, ANOVA and linear regression were used to assess relationships among bivariate, multivariate and continuous demographic variables and knowledge about hepatitis B. An ANOVA was then used to perform a multivariate analysis on demographic variables with statistical significance set at $P < 0.1$. χ^2 tests and Fisher's exact test, when necessary, were used to assess relationships among demographic variables and barriers to health care or stigma of infection. Multivariate analyses were then performed on all variables with statistical significance set at $P < 0.1$, using ANOVA to further assess their relationships. Statistical analysis was performed using SAS for Windows, version 9.1 (SAS Institute Inc, USA).

RESULTS

Population characteristics

A total of 232 patients were approached, however, 28 patients were excluded. Six patients were excluded because they stated they were not Chinese, four were younger than 18 years of age, five patients declined to participate and 13 were also being seen by hepatologists who were not contributing authors of the present report. The total number of surveys analyzed was 204; 102 from the Toronto Western Hospital Liver Clinic (referred from other family physicians) and 102 from the offices of two specific family physicians. The demographic characteristics of the study population are shown (Table 1 and Figure 1). The patients recruited had a mean age of 45.3 years and 68% of the study population were younger than 55 years of age. There was a predominance of men (63%). The majority of patients were Canadian citizens (74%) or landed immigrants (20%), and had lived in Canada for more than 10 years (66%). They were mainly high school educated (46%), but 34% had post secondary education, 17% had primary school education and 3% had no formal education. Most participants were employed (62%)

TABLE 2
Responses to questions about hepatitis B knowledge

Question (Correct response)	Correct response, n (%)
In my opinion, hepatitis B can be transmitted via sexual contact. (True)	164 (80)
In my opinion, hepatitis B can be transmitted from mother to child at birth. (True)	174 (85)
In my opinion, hepatitis B can be transmitted by sharing food. (False)	97 (48)
In my opinion, hepatitis B can affect...? (adults and children)	171 (84)
Do you know what cirrhosis is? (Yes)	117 (57)
In my opinion, hepatitis B can cause cirrhosis. (True)	169 (83)
In my opinion, hepatitis B can cause liver cancer. (True)	179 (88)
In my opinion, hepatitis B can be cured. (False)	116 (57)
In my opinion, hepatitis B is a transient infection – like the flu. (False)	174 (85)
In my opinion, there are effective treatments for hepatitis B. (True)	128 (63)
In my opinion, there is a vaccination to prevent hepatitis B. (True)	176 (86)
In my opinion, people infected with hepatitis B can have no symptoms. (True)	169 (83)
In my opinion, people with severe hepatitis B can have no symptoms. (True)	61 (30)
In my opinion, healthy people with hepatitis B do not need to be followed by a doctor. (False)	163 (80)

TABLE 3
Hepatitis B education

Variable	Response	n (%)
Adequate hepatitis B education in the Chinese community?*	Yes	57 (30)
Source of hepatitis B knowledge†	Doctors	159 (78)
	Family	36 (18)
	Media	68 (33)
	School	10 (5)
	Other	27 (13)

*Total sample size was 189 patients. Fifteen patients did not respond;

†Patients could select as many options as applied to them

with the remainder being retired (19%), homemakers (7%), unemployed (6%) or students (6%).

Hepatitis B knowledge

Patients' knowledge about hepatitis B is illustrated in Table 2. On average, patients answered 10 of the 14 questions correctly. They were aware that hepatitis B could be sexually (80%) and vertically (85%) transmitted. However, 52% of patients believed that sharing food could also transmit the disease. Most patients knew that cirrhosis (83%) and liver cancer (88%) can occur with chronic infection. Although 83% of patients knew that people with CHB infection could be asymptomatic, only 30% knew that they could remain asymptomatic in the presence of severe disease.

When surveyed, only 30% of patients believed that there was adequate education about hepatitis B in the Chinese community and 78%, 33% and 18% of respondents stated that

TABLE 4
Hepatitis B knowledge in relation to sociodemographic variables

Demographic	Test score (mean ± SE)	95% CI
Location		
Family practice	9.3±0.24	8.84 to 9.78
Liver clinic	11.1±0.17	10.79 to 11.48
Age range, years		
Younger than 25	10.5±0.35	9.75 to 11.20
25 to 39	11.0±0.21	10.59 to 11.44
40 to 54	9.7±0.32	9.09 to 10.37
55 to 65	10.4±0.39	9.59 to 11.19
Older than 65	8.2±0.54	7.06 to 9.30
Able to speak Cantonese		
Yes	9.9±0.20	9.46 to 10.26
No	10.7±0.27	10.19 to 11.28
Able to speak Mandarin		
Yes	10.6±0.18	10.19 to 10.91
No	9.5±0.29	8.89 to 10.06
Able to speak English		
Yes	11.1±0.20	10.70 to 11.52
No	9.5±0.22	9.10 to 9.96
Education level		
None/Primary	8.0±0.46	7.07 to 8.93
High school	10.0±0.20	9.57 to 10.38
College/University	11.5±0.18	11.11 to 11.82
Employment status		
Employed	10.4±0.21	10.01 to 10.85
Retired	8.7±0.47	7.71 to 9.60
Other	10.4±0.26	9.86 to 10.91
Marital status		
Single	11.1±0.25	10.59 to 11.61
Married	10.0±0.21	9.60 to 10.42
Other	9.0±0.52	7.98 to 10.09

they relied on their physicians, media and family, respectively, for information about hepatitis B (Table 3). Patients could select more than one answer for this question.

Comparison of patients' demographics with their hepatitis B knowledge are summarized in Table 4. Student's *t* test or ANOVA revealed that age group, educational level, employment status, marital status, being followed by a hepatologist and languages spoken were associated with better knowledge concerning hepatitis B ($P < 0.01$). When these variables were entered into a multiple regression model (Table 5), patients who were followed by a specialist, who had more education or who spoke Mandarin had significantly higher test scores ($P < 0.05$). No other demographic variables were significantly associated with hepatitis B knowledge ($P > 0.1$ for all) in univariate analysis. A series of Bonferroni-adjusted pairwise comparisons further delineated differences within the multivariate categories. Patients with university or college level education had significantly higher test scores compared with patients with high school-level education and patients with primary or no education ($P < 0.01$). High school educated patients had higher scores than those with primary or no education ($P < 0.01$).

TABLE 5
Multivariate analysis comparing hepatitis B knowledge with sociodemographic variables

Demographic	F value (df)	P
Education	6.33 (2,185)	0.0022
Location	6.72 (1,185)	0.0103
Able to speak Mandarin	4.93 (1,185)	0.0277
Age group	1.43 (4,185)	0.2255
Able to speak Cantonese	0.39 (1,185)	0.5306
Marital status	0.49 (2,185)	0.6114
Employment status	0.26 (2,185)	0.7701
Able to speak English	<0.01 (1,185)	0.9548

df Degrees of freedom

TABLE 6
Multiple logistic regression analysis comparing shared status with sociodemographic variables

Demographic	χ^2 (df)	P	OR (95% CI)
Overall model	14.59 (4)	0.0056	n/a
Employment status	3.28 (2)	0.1944	n/a
Able to speak Cantonese	3.11 (1)	0.0776	n/a
Able to speak Chinese dialect other than Cantonese or Mandarin	6.41 (1)	0.0113	Yes versus No: 0.44 (0.24 to 0.83)

df Degrees of freedom; n/a Not applicable

Stigma of CHB infection

Two-thirds of the patients believed they were stigmatized by having hepatitis B. Thirty-one per cent of patients felt ashamed about their illness and only 47% were willing to discuss their illness with friends and family.

In univariate analysis, patients who were born in China ($P=0.02$), who were not Canadian citizens or landed immigrants ($P=0.01$), who were unemployed or students ($P=0.02$) or who had lived in Canada less than 10 years ($P<0.01$) were more likely to feel ashamed about their illness. Knowledge of hepatitis B, assessed by the survey, and other demographic variables were not significantly associated ($P>0.1$). However, our multiple regression model using all variables with a significance level of $P<0.1$ indicated there was no significant association with stigmatization. The overall model had a P value of 0.0035.

Multivariate analysis of all variables with significance set at $P<0.1$ revealed that patients who spoke a Chinese dialect other than Cantonese and Mandarin were statistically more likely to share their hepatitis B status (Table 6).

Self-perceived barriers to health care

The top three self-perceived barriers to health care identified by the study patients were time (57%), inconvenience (40%) and language (21%) (Table 7). Multiple regression revealed that patients younger than 65 years of age had a higher likelihood of citing time as a barrier to health care (Table 8). Univariate analysis revealed that patients who were younger than 65 years of age ($P=0.02$), were not born in Vietnam ($P=0.05$), could speak English ($P<0.01$), had more than primary school education ($P<0.01$) and had lower hepatitis B knowledge scores ($P=0.03$) were significantly more likely to cite inconvenience as a barrier to health care. However, multiple

TABLE 7
Self-perceived barriers to health care

Barrier	Ranked in the top 3 by patients, n (%)
Time	116 (57)
Inconvenience	81 (40)
Language	42 (21)
Travel distance	39 (19)
Cost	32 (16)
Unnecessary	32 (16)
Fear	25 (12)

regression analysis found that none of these variables were independently associated. Patients who could not speak English and those born in Hong Kong were more likely to cite language as a barrier (Table 9).

DISCUSSION

The present study suggests that Chinese patients attending two downtown Toronto family physician offices or a nearby tertiary care referral centre, are aware of the serious complications associated with CHB infection. However, 70% are unaware that these serious complications can be present despite a lack of symptoms. Of particular concern are those individuals older than 65 years of age, retired and unable to speak English because they had a lower awareness of hepatitis B and its complications, yet are most likely to be at risk of serious complications. This is in contrast to the Chinese population in Richmond, British Columbia, where increasing age resulted in an increased likelihood of being more knowledgeable (11). Similar to previously published studies in Vancouver (11,17), higher levels of education and fluency in English were associated with more knowledge about hepatitis B. These previous studies assessed patients who were randomly interviewed at a large mall whereas our study interviewed patients who were attending a physician's office. This may explain why our patients had a slightly higher level of awareness about hepatitis B and its complications. In contrast, our inner-city population had a relatively low level of education; only 34% had postsecondary education in comparison with the general Canadian population 53% (16).

We attempted to investigate the stigma associated with hepatitis B infection by assessing whether patients felt ashamed about their hepatitis B status and whether they were willing to inform others about their chronic infection. Only one-third of patients were not ashamed and willing to 'share' their positive hepatitis B status, perhaps indicating that the majority believe there is a stigma associated with being infected with hepatitis B. This may be related to the belief held by 52% of our patients that sharing food can transmit hepatitis B. The fear that they may easily spread hepatitis B to others may make them more likely to feel ashamed and discourage them from speaking about their infection. Our study failed to show an association between overall knowledge about hepatitis B and this sense of stigmatization. In fact, less knowledgeable patients tended to be less ashamed, perhaps because those who were older may have been less likely to realize that hepatitis B is transmissible. It is possible that older age, rather than knowledge, drove this association because the 'stigma' regarding CHB infection has only recently been promoted – at least in China. Indeed, we found that

TABLE 8
Multiple logistic regression analysis comparing barrier of time with sociodemographic variables

Demographic	χ^2 (df)	P	OR (95% CI)
Overall model	30.48 (14)	0.0066	n/a
Location	0.40 (1)	0.5254	n/a
Age group, years	9.61 (4)	0.0476	25 versus 65: 16.71 (1.83 to 152.59) 25–39 versus 65: 7.47 (1.24 to 45.04) 40–54 versus 65: 3.05 (0.55 to 17.00) 55–64 versus 65: 3.91 (0.80 to 19.03)
Marital status	0.28 (2)	0.8680	n/a
Employment status	0.12 (2)	0.9437	n/a
Able to speak English	0.07 (1)	0.7875	n/a
Able to speak Cantonese	0.29 (1)	0.5901	n/a
Education level	3.12 (2)	0.2100	n/a
Knowledge	0.10 (1)	0.7513	n/a

df Degrees of freedom; n/a Not applicable

TABLE 9
Multiple logistic regression analysis comparing language with sociodemographical variables

Demographic	χ^2 (df)	P	OR (95% CI)
Overall model	25.63 (6)	0.0003	n/a
Able to speak English	6.55 (1)	0.0105	No versus Yes: 6.10 (1.53 to 24.38)
Birthplace	7.95 (3)	0.0471	China versus Hong Kong: 0.16 (0.05 to 0.59) Vietnam versus Hong Kong: 0.15 (0.03 to 0.69) Other versus Hong Kong: 0.00 (0.00 to 999.99)
Education	0.05 (2)	0.9760	n/a

df Degrees of freedom

patients from China were more likely to be ashamed about their illness. This may be related to the fear of discrimination with regard to being chronically infected with hepatitis B that exists in China (19-21).

From our questionnaire, we identified three main barriers to health care: time, inconvenience and language. Patients who were more likely to cite time and inconvenience as barriers tended to be less knowledgeable about hepatitis B. Patients who could speak English tended to cite inconvenience more often. These patients tended to be younger and employed, and thus, were more inconvenienced by the need to attend frequent medical appointments. The most common and worrisome knowledge gap in our study population is that patients with severe complications from hepatitis B can remain asymptomatic. Therefore, improved patient education that emphasizes that serious complications may occur silently in hepatitis B infection and yet be controlled with treatment could potentially enhance an individual's willingness to access health care. Improving awareness among physicians (the major source of knowledge indicated by the interviewees) and using the media may be effective means to improve disease awareness. Patients who were being followed by family practitioners whose offices offered extended hours were less likely to cite time as a barrier to access care. Additionally, patients who were fluent in English were less likely to cite language as a barrier. Unfortunately, only 35% of our patients were fluent in English although the majority of our patients were Canadian citizens or landed immigrants and had lived in Canada for more than 10 years. Therefore, culturally responsive multilingual clinics with extended hours may help reduce the time and lower the language barriers that many Chinese patients experience.

Although a cross-section of the population in Toronto's downtown Chinatown was sampled, this population may not

be representative of Chinese patients in other communities. Of particular concern are new immigrants who may not have had exposure to the health care system and have little understanding of the benefits of preventive health strategies. These immigrants, who may be unaware of their hepatitis B status, have been instilled with a sense of fear of stigmatization should they be identified as being infected with hepatitis B.

The common misconception that severe liver disease due to CHB is symptomatic, may prevent those chronically infected with hepatitis B from overcoming concerns they have about both the time and the inconvenience associated with regular medical follow-up for something that gives rise to no symptoms. Implementation of programs that increase awareness of the asymptomatic nature of severe disease and promote the concept of preventive rather than symptomatic treatments delivered in multiple languages need to be promoted to reduce mortality from CHB. To work within patients' time constraints so that they can maintain full-time employment should improve patients' access to health care and ultimately lead to improved health outcomes in the large immigrant population in Canada.

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