RESEARCH COMMUNICATION

Attitudes toward Hepatitis B and Liver Cancer Prevention among Chinese Americans in the San Francisco Bay Area, California

Ellen T Chang[1,2], Bang H Nguyen[1], Samuel KS So[2]

Abstract

Background: Chronic hepatitis B and associated liver cancer constitute important health threats with disparity among Asian/Pacific Islander Americans (APIs). However, many APIs are unaware of and unprotected against these diseases. Methods: To inform the development of community-based programs to increase hepatitis B and liver cancer awareness and prevention among APIs, we conducted a series of qualitative focus groups in 2007 to identify motivations and deterrents related to hepatitis B education, testing, and vaccination among San Francisco Bay Area Chinese Americans. Six focus groups were held in Cantonese, English, or Mandarin for women or men, respectively. Recorded transcripts were transcribed, translated, and then coded by consensus. Results: Factors that motivated individuals to be tested for hepatitis B included peace of mind, prevention of transmission to others, informed decision-making ability, convenience, and pre-vaccination screening. Primary motivations for hepatitis B vaccination were protection of future health and avoidance of hepatitis B. However, factors that discouraged people from testing or vaccination included costs, lack of health insurance, fear of side effects, worries about reliability or efficacy, poor patient-doctor communication, reliance on professional opinion, apparent good health, inconvenience, and personal preference. Individuals were generally in favor of informing relatives and friends about hepatitis B testing and vaccination, and offered several reasons for and against educating others about these activities. Conclusions: In summary, our study identifies common attitudes and influences regarding the decision to take preventive action against hepatitis B and liver cancer. These findings can be applied toward the design of more effective educational and outreach materials and programs for Chinese Americans and possibly other APIs.

Key Words: Chinese Americans, focus groups, hepatitis B, liver cancer, prevention & control

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Introduction

Liver cancer is the third most common cause of cancer death in Asian/Pacific Islander Americans (APIs) (SEER 2008), and the majority of cases are attributable to chronic hepatitis B (Hwang et al., 1996; Parkin, 2006). Because over 80% of liver cancer cases and deaths worldwide occur in eastern and southeastern Asia, Melanesia, and sub-Saharan Africa (Parkin et al., 2005), it is largely perceived as a problem of the developing world. However, a sizeable and growing proportion of the US population - particularly immigrants from high-incidence regions - is at elevated risk of developing liver cancer, making it a vital public health problem in the US as well. The discrepancy in liver cancer incidence between APIs and other racial/ethnic groups is ascribed mainly to variation in the prevalence of chronic hepatitis B, which affects approximately 10% of the population in eastern and southeastern Asia, as well as migrants from these regions (Custer et al., 2004). In contrast, the prevalence is only 0.2-0.5% in the overall US (Custer et al., 2004). Even as the incidence rate of liver cancer increases throughout the population (El-Serag et al., 2003), it remains 2 to 8 times higher in API subgroups than in non-Hispanic Whites (Chang et al., 2007). Thus, liver cancer represents a major racial/ethnic health disparity in the US—one that could largely be preventable through hepatitis B screening and vaccination.

Despite their elevated risk of chronic hepatitis B and liver cancer, many APIs are not informed of or protected against these diseases (Taylor et al., 2000; 2002; Thompson et al., 2002; Taylor et al., 2004; Choe et al., 2005; Taylor et al., 2005; Taylor et al., 2005; Chen et al., 2006; Choe et al., 2006; Taylor et al., 2006; Ma et al., 2007; Ma et al., 2007; Wu et al., 2007). The first step toward reducing the health disparity due to liver cancer is to screen all APIs, especially the foreign-born, for chronic hepatitis B and to vaccinate those found to be unprotected. Vaccination of vulnerable adults not only prevents the development of hepatitis-B-associated liver

*[1]Northern California Cancer Center, Fremont, Walnut Avenue, Suite 300, Fremont, CA, 94538, [2]Asian Liver Center at Stanford University, Stanford, CA *For correspondence: ellen@nccc.org*

cancer in those individuals, but also prevents infection and transmission of the hepatitis B virus to others, especially infants and children. Individuals who test positive for chronic hepatitis B should be screened regularly for liver cancer through serum alpha-fetoprotein measurement and liver ultrasound (McMahon and London, 1991; AISF, 1992; Nguyen and Keeffe, 2002), and possibly treated with antiviral therapy (Liaw et al., 2004). Community-wide programs promoting hepatitis B and liver cancer prevention and awareness are needed to encourage potentially life-saving activities among APIs.

In order to develop effective, culturally tailored interventions to increase hepatitis B awareness, screening, vaccination, and clinical follow-up among APIs, special attention to language and cultural issues is needed. According to the 2000 US Census, nearly 70% of APIs are foreign-born and about three-quarters of those immigrated to the US within the last 20 years (United States Census Bureau, 2008). Thus, many APIs have close ties to their native cultural traditions and values. For example, Chinese Americans, who comprise the largest proportion of APIs in the US (United States Census Bureau, 2007), are deeply influenced by the philosophies and religions of Confucianism, Taoism, and Buddhism (Shih, 1996; Chen, 2001; Liang et al., 2004; Chan et al., 2006). These systems of belief, which include many overlapping concepts, in turn shape Chinese values and behaviors related to health and illness. Confucius taught that filial piety, loyalty, righteous conduct, and harmonious relationships with others are the keys to a good life and good health (Shih, 1996; Chen, 2001; Chan et al., 2006). Taoism emphasizes that peace of mind and health require a careful balance throughout nature and within oneself between the opposing but unified energy forces of yin and yang (Shih, 1996; Chen, 2001; Chan et al., 2006). Buddhism proposes that health is determined by forces of fate and cause-and-effect, and that being moderate, merciful, humble, and benevolent toward others will lead to a healthy mind and body (Shih, 1996; Chen, 2001). The profound influence of these beliefs on Chinese Americans' conceptions of health and illness can be seen, for example, in the conviction that proper eating habits, with a balance of yin and yang foods, are essential to prevent disease (Satia-Abouta et al., 2002), and that the health of one's family is vital to one's individual health (Shih, 1996; Chan et al., 2006). In addition, past qualitative studies suggest that traditional Chinese values can lead to misconceptions of diseases and their causes, and may prevent some individuals from seeking Western biomedical help (Shih, 1996; Liang et al., 2004).

Qualitative focus groups have become a standard method in public health for developing campaign messages and assessment tools (Kohler et al., 1993; Kitzinger, 1995; Manfredi et al., 1997). These open discussions enable community members to shape public health programs by expressing their opinions, beliefs, and values about health education and health care. Therefore, we conducted a series of focus groups to inform the design and implementation of community-based interventions to prevent chronic hepatitis B and liver cancer among San Francisco Bay Area Chinese Americans, who are a culturally diverse group in themselves (Gao and Ting-Toomey, 1998) and are the largest subgroup of APIs in the Bay Area (United States Census Bureau, 2008). Our aims were to identify motivations for and deterrents from taking preventive action against chronic hepatitis B and liver cancer, as well as spreading awareness of these diseases, in the Chinese-American community.

Materials and Methods

Study population

Forty-seven Chinese-American adults were recruited in person by bilingual interviewers and through bilingual flyers posted at local community-based organizations, health centers, libraries, schools, and supermarkets. The flyers advertised a toll-free telephone number that individuals could call to leave a message inquiring about the study. Interviewers then called back to inform potential participants about study details and enroll them if they were eligible and interested. Eligible participants were required to be between 18 and 74 years of age; of Chinese or Chinese-American background; able to speak Cantonese, Mandarin, and/or English; residing in the San Francisco Bay Area; and without a family history of liver cancer or other liver disease. All participants provided written informed consent, completed a brief written questionnaire about social and demographic characteristics, and were offered a small stipend as a token of appreciation. The study protocol and materials were approved by the Institutional Review Board of the Northern California Cancer Center.

Focus groups

Trained bicultural and bi- or trilingual interviewers, including three moderators and three assistants, led six two-hour qualitative focus groups separated according to language (Cantonese, Mandarin, or English) and gender (male or female). Focus groups were held on three separate weekends between January and March, 2007, at the Asian Cultural Center in Oakland, California. Each focus group comprised four to twelve participants, with an average of eight participants per session. Focus groups began with a discussion of general preventive health activities, then progressed to a more specific discussion of hepatitis B and liver cancer preventive activities and attitudes. All focus groups were audiotaped with the participants' consent. The moderators and assistants were debriefed in depth after each focus group to note their insights and impressions regarding the participants, their interactions, and the overall discussion.

Data analysis

Audiotapes were transcribed verbatim in the original language, then translated into English (if necessary), by the moderator of each focus group. The transcripts were then reviewed and their contents were analyzed by two study investigators in collaboration with the three focus group moderators. The data analysis proceeded according the following steps: 1) content analysis; 2) coding of data; and 3) verification of findings through debriefing of focus group moderators and assistants who participated in each

focus group (Patton, 1987; Kruger, 1998). Coding guidance was provided by a study investigator trained in qualitative health research. The coding framework was developed to classify the participants' statements into broad topics with overlapping themes, especially those related to factors that affect preventive health behaviors and prevention and awareness of hepatitis B and liver cancer. For example, content codes for deterrents from hepatitis B testing included "cost/insurance", "side effects", and "inconvenience". Any disagreements about code choices were resolved through discussion among research team members. All analytic steps and decisions were documented to ensure that the analysis was verifiable and reproducible. Representative quotations for each content code were selected by the investigators and focus group moderators.

Results

The distribution of sociodemographic characteristics among the focus group participants is shown in Table 1. All but one were first-generation immigrants, with 78% born in mainland China, 13% born in Hong Kong, and 7% born elsewhere in Asia. On average, those born elsewhere had lived in the US for 10-14 years. Participants were generally of lower socioeconomic position, as most lacked a college education and had an annual household income below $25,000.

Staff members noted few major differences in discussion content among the focus groups, although there were some cultural differences between individuals born in China and those born in Hong Kong, as well as between recent and past immigrants. Women were generally more talkative than men, and some of the women appeared to have been acquainted with each other previously. In general, participants seemed comfortable, talkative, and eager to share their opinions and experiences with the group.

General preventive health behavior

Participants engaged in several common preventive health behaviors, including following a healthy and moderate diet, exercising, getting regular and adequate sleep, having a positive mental outlook, keeping good hygiene, taking vitamin supplements and prescribed medications, not smoking or using illicit drugs, maintaining a supportive social network, undergoing routine cancer screening, and following doctors' advice. Motivations for these behaviors included a concern for long-term health; a desire for internal balance; avoidance of diseases; practical and financial concerns; and personal contentment (Table 2). Those who did not engage in some of these behaviors were deterred by a shortage of time; competing priorities; or a lack of concern.

Table 1. Sociodemographic Characteristics of Focus Group Participants

Characteristic	N	(%)	Characteristic	N	(%)
Age (years)			Education level		
18-34	6	(13%)	Elementary school	7	(15%)
35-44	10	(21%)	Junior high/some high school	7	(15%)
45-54	7	(15%)	High school	12	(26%)
55-64	7	(15%)	Some college/vocational school	7	(15%)
65-74	17	(36%)	College/graduate school	13	(28%)
Gender			Employment status		
Female	25	(53%)	Employed	15	(32%)
Male	22	(47%)	Unemployed	7	(15%)
Language spoken at focus group			Student	2	(4%)
Cantonese	21	(45%)	Homemaker	11	(23%)
Mandarin	16	(34%)	Retired	10	(21%)
English	10	(21%)	Other/disabled	2	(4%)
Country of birth			Annual household income		
China	36	(78%)	<$25,000	27	(64%)
Hong Kong	6	(13%)	$25,000-$49,000	6	(14%)
Indonesia, Taiwan, or Vietnam			$50,000-$74,000	4	(10%)
	3	(7%)	$75,000+	5	(12%)
U.S.	1	(2%)	Don't know/missing	5	
Missing	1		Household size (persons)		
Years lived in U.S., if born elsewhere			1	1	(2%)
0-4	7	(18%)	2	18	(39%)
5-9	7	(18%)	3	8	(17%)
10-14	14	(36%)	4	13	(28%)
15-19	6	(15%)	5+	6	(13%)
20+	6	(15%)	Missing	1	
Missing	7		Insurance status		
Marital status			Private	11	(24%)
Married	38	(81%)	Medi-Cal	8	(17%)
Never married	4	(9%)	Medicare	3	(7%)
Separated/divorced	2	(4%)	Medicare + private	1	(2%)
Widowed	3	(6%)	Medicare + Medi-Cal	14	(30%)
			None	9	(20%)
			Don't know/missing	1	(2%)

Table 2. Illustrative Quotations from Focus Group Participants

Topic	Subtopic	Comment
Motivations for general preventive health behaviors		
	Long-term health	"It's hard to be disciplined, but it's very important because of long-term benefits." EW
	Internal balance	"Paying attention to a healthy diet is to keep balance. Different foods can protect different organs." MM
	Avoidance of diseases	"You try to take care of yourself before you really get sick." EM
	Practical/financial concerns	"Health is fortune. We go to work every day to make money. If you are not healthy, you don't have the ability to work, you will not have income... and if you are hospitalized, you will lose lots of money, medical expenses." MW
	Personal contentment	"I just like it. I like playing sports. I feel good with that." MM
Deterrents from general preventive health behaviors		
	Lack of time	"Eating healthy, exercising - when you are busy, these are always ignored…I don't have time to do all these things." EW
	Competing priorities	"Sometimes you are in the middle of something, whether it is reading a good book or watching television or a movie, or other activities, and you say, 'I should go to sleep so I can wake up earlier,' but you end up sleeping later than you maybe should." CM
	Lack of concern	"We don't care about keeping fit. Let the body be fat." CW
Motivations for flu vaccination		
	Doctor's recommendation	"The doctor said it's better to have it." CM
	Prevention of illness/disability	"I want to prevent future infection. Once I get the flu, I cannot go to work and I won't have income." MM
	Example of others	"I saw other people getting the flu shot, and then I went to get the flu shot, too." MM
Deterrents from flu vaccination		
	Lack of necessity	"I feel that this flu thing is not for everyone...so it is not a must to have the flu vaccine"MW
	Adverse side effects	"I heard someone say it would make one infected with the flu if one took the shots" CM
	Inadequate efficacy	"I don't think it really helps because it's just for the past year's virus. It cannot prevent next year because the virus always changes every year" EW
	Lack of information	"I've never gotten the flu shot…because I don't know enough about the flu" EW
	Lack of time	"Some years I got to busy or it just got too late in the season, and I just said, 'OK, it probably would not help me very much because, by this time of the year…there is not much of the season left" EM
	Preference for natural immunity	"I try to naturally let the body's immune system work, so I just rely on that." CM
Motivations for hepatitis B screening		
	Peace of mind	"It is better to check it up, get screened, to see whether my immune ability is like that, so that I can be assured about my health." MW
	Avoidance of infecting others	"If you check and you know that you have this disease, then for the people surrounding you, you will not infect them." MW
	Informed decision-making	"Like everything else, it is just information; you make better decisions." EM
	Convenience	"I have blood tests every year. It's not whether I would consider it; the question is whether the blood test is that kind." CM
	Basis for vaccination decision	"The result of the test determines whether you need to get the vaccine. If the result determines that you don't need to get it, there will no next steps." MM
Motivations for hepatitis B vaccination		
	Protection of future health	"The process is for your future health and well-being." EM
	Avoidance of hepatitis B	"I have a friend who has hepatitis B. It's very horrible for her. She was born with it. I don't want to have to go through that." EW
Deterrents from hepatitis B screening or vaccination		
	Cost or lack of health insurance	"I don't know what the cost will be involved in taking the test. If I have health insurance it will be not a problem, but the cost is also is a factor for taking the test." EM
	Adverse side effects	"The reason that I don't want to get vaccinated is because I do not trust the vaccine that much…The vaccine is very new; this vaccine sometimes has side effects." MW
	Uncertainty about test reliability	"I heard that sometimes the test is not really reliable, sometimes gives false positives or negatives. If the test is not accurate, you get emotional, your family gets worried." EM
	Uncertainty about efficacy	"I want to continue to research the reliability of the vaccine..I am going to have to do some research on its feasibility." MM
	Lack of patient-doctor communication	"Our communication is only so-so. Now I feel having a family doctor is quite troublesome because you have to go through him for everything… I don't know whether he would help me to get the vaccination." CW
	Need for doctor's advice	"After seeing the doctor, I'll follow what the doctor recommends. If he says I need to get it, then I will. If he says I don't, then I won't." CM
	Good personal health	"If there's nothing wrong with me, why should I get the vaccination?" CM
	Inconvenience	"I don't want to have to find parking, to travel." EW
	Personal preference	"That's my personal thing, at least for myself." EW

Table 2 (continued). Illustrative Quotations from Focus Group Participants

Topic	Subtopic	Comment
Motivations for completing the three-shot vaccination series		
	Completion of what one starts	"Either I don't start at all or if I start, I will finish it…Once you get one [shot], you have to get all three; otherwise, don't get it at all." CW
	Vaccine efficacy	"If this is a process, only getting the first dose will be no use. Since three doses are required for the process, we must finish them. Otherwise it's not effective." MM
	Doctor's orders	"I think you don't know what hepatitis B is, so you just have to follow up with what the doctor says." EM
	Protection of health	"If it matters, I'll take all three shots in order to finish. It's for health…Think about the trade-off." EW
Deterrents from completing the three-shot vaccination series		
	Scheduling and logistical conflicts	"Inconvenience—if you have some other plans or the weather is bad or you have something else to do." EM
	Forgetfulness	"We're at this age where we sometimes forget. I'm afraid there are a lot of things we forget. It's better if they remind us a bit." CM
	Cost	"It's not OK if costs are too high and not affordable." MM
	Adverse side effects	"I will see the reaction of my body to the first injection and how I feel after the first dose. If nothing is wrong, or there is only a little bit of side effects, I will continue. If there are serious side effects, I will give up." MM
	Concurrent health issues	"[If] you just have the flu…will this affect it? We need to talk to a doctor ahead of time [to find out] whether we could have the second shot if we are sick." MW
Motivations for informing others about hepatitis B screening and vaccination		
	Protection of others' health	"If it is good for health we should share with our relatives and friends." MW
	Protection of own health	"It helps to protect yourself, too. If you are the second generation, you try to explain to your parents, just tell them that is going to protect your son, your daughter, if you…just get tested, get treated." EM
	Community well-being	"This also demonstrates the responsibility for society because the disease is communicable." MM
	Others informed decision-making	"When I know something, then I would tell them. It's up to them to listen or not." CW
	Fear of hepatitis B epidemic	"Having heard that, heard the statistics, I'm afraid." CW
	Prompting of others	"I feel that we should tell him, because he does not know whether he has it or not. After the screening if he is positive, he should work with the doctor…That way he could live longer." MW
Deterrents from informing others about hepatitis B screening and vaccination		
	Denial	"Some people are really stubborn…It's hard to deal with this kind of people. No matter how you promote, they still won't listen." CM
	Lack of health insurance	"If it is free then he may go. If he needs to pay for the insurance, he may not go." MW
	Apparent health	"It's not necessary to tell them if family members and friends are very healthy." MM
	Generation gap	"There is generation gap and then age gap, so sometimes these are barriers to the personal or health care issues such as diseases." EM
	Adverse side effects	"If I don't know what the test is about, I mean, if there is lots of pain, lots of question marks you get there, you might not want to get them involved into something that gets into so much trouble." EM
	Potential discrimination	"In China, there is some discrimination against hepatitis B patients, hepatitis B virus carriers, and people having been cured. Some people are infected and don't want to tell other people they are. Or they don't want to tell other people their family members have been infected." MM
	Lack of authority	"I think that regarding information promotion, if the doctor could help, then it would be better than if we did it." MW
Other topics related to hepatitis B and liver cancer prevention		
	Costs or insurance	"Do you have to have health insurance to get the vaccine?…If I don't have health insurance, where could I get tested at low cost, if possible?" EM
	Routine blood testing	"I thought that every year they draw blood, check the whole body…I thought they had tested everything and checked everything." CM
	Lack of patient-doctor communication	"Although I have blood tests, the doctor didn't say he had tested for hepatitis B. So I guess he didn't have me tested for that." CM
	Communication of positive test result	"After we know [hepatitis B cannot be cured], it is not possible for us to tell friends and relatives. If we knew that it could be cured, then we could tell them, but [since] it cannot be cured, should we tell him?…It will disturb his life, his life will be reduced." MW

CM: Cantonese-speaking man; CW: Cantonese-speaking woman; EM: English-speaking man; EW: English-speaking woman; MM: Mandarin-speaking man; MW: Mandarin-speaking woman

Table 2 (continued). Illustrative Quotations from Focus Group Participants

Topic	Subtopic	Comment
Questions about hepatitis B		
	Where to get tested or vaccinated	"Is there a specified place to get this vaccination?" CM
	Follow-up on negative test results	"I had blood drawn and tested negative. They sent a letter saying, "You're fine." Then, do I need to go every year to check?" CW
	Duration of vaccine protection	"Once you complete the three vaccinations, is it done for the rest of the life?" CM
	Target subgroups for vaccination	"I think my children all got immunization for hepatitis B before three years of age in the U.S. It's not just for us, the immigrants, right?" EW
	Employer regulations	"If a place is going to hire you, do you need to have a health check? Is there a body check?" CM
	Immigration laws	"Immigrants from China get a blood test before they come here. If they have hepatitis B, are they allowed to come here?" EW
General		
	Appreciation for focus group	"Not until today have we learned about this, so I feel I've benefited quite a bit today … And at this meeting, you learn about this information about this vaccination, it's something money can't buy." CW

CM: Cantonese-speaking man; CW: Cantonese-speaking woman; EM: English-speaking man; EW: English-speaking woman;

In particular, to draw a parallel with the hepatitis B vaccine, we asked whether participants had received the flu vaccine. Their reactions were mixed, with roughly equal numbers saying they had or had not. Those who routinely received the flu vaccine did so because it was recommended by their doctor; because it would prevent illness and disability; or because they had followed the example of others (Table 2). Those who were opposed to or uncertain about getting the flu vaccine believed that the vaccine was not necessary; they worried about possible adverse side effects or inadequate efficacy; they felt they were not well enough informed about the flu or the vaccine; they lacked time; or they preferred to rely on their natural immunity as a defense against the flu.

Hepatitis B screening and vaccination

After being told briefly about the risks and prevention of chronic hepatitis B, participants were asked whether they would be interested in being tested for or vaccinated against the infection. Most were in favor of being tested, for reasons that included peace of mind, given a negative test result; the need to take precautions to avoid infecting others, given a positive test result; the ability to make informed decisions; the convenience of adding the test to existing routine blood tests; and the need to determine whether to get vaccinated (Table 2). Likewise, most participants were willing to get vaccinated in order to protect their future health, and to avoid developing hepatitis B, especially after having known others with the disease.

On the other hand, participants noted a number of deterrents from hepatitis B testing and vaccination. Most prominent was cost or lack of health insurance (Table 2). Other potential barriers included fear of side effects; worries about test reliability or vaccine efficacy; lack of patient-doctor communication; the need for a doctor's advice; apparently good personal health; inconvenience; and personal preference.

Completion of the hepatitis B vaccine

Focus group participants were generally confident that after receiving the first shot of the three-shot vaccine series, they would return for the second and third shots. It was unanimously agreed that one should finish what one starts (Table 2). Participants also felt that one should complete the vaccine series to make sure that it was effective; follow doctors' orders; and protect one's own health. It was suggested that an individual might be more likely to return for follow-up vaccine shots if he or she received reminder notices, noted future appointments on a calendar, or paid for all three shots in advance (quotations not shown).

Even so, participants (especially men) did mention some possible deterrents from returning for subsequent vaccine shots. These included scheduling and logistical conflicts; forgetfulness; cost; adverse side effects; and concurrent health issues (Table 2).

Hepatitis B and liver cancer awareness

Most participants were eager to inform family members and friends about hepatitis B testing and vaccination. Their reasons for doing so were to protect the health of others; to protect oneself; to benefit the community; to take one's own responsibilities, then leave it to others to make educated decisions; to act on their fear of the hepatitis B epidemic; and to prompt others to seek medical care, if necessary (Table 2).

Participants also cited a handful of reasons not to inform relatives and friends. For example, others might not accept or utilize such information because they are in denial; lack health insurance; seem healthy; or are of a different generation. Other barriers to spreading hepatitis B and liver cancer awareness were the possibility of side effects from testing and vaccination; the potential for discrimination against those with hepatitis B; and self-perceived lack of authority.

Other issues related to hepatitis B and liver cancer prevention

In addition to the topics introduced by the focus group moderators, the participants themselves raised several issues about hepatitis B and liver cancer prevention. The most frequently discussed subjects were the costs of the hepatitis B test and vaccine, and whether the test was routinely performed by doctors (Table 2). Lack of communication with doctors was another recurring theme.

In the Mandarin women's focus group, a prominent topic of discussion was how to deliver the news of a positive test result to family members or friends.

With regard to hepatitis B itself, participants wanted to learn more about risk factors, modes of transmission, symptoms, and treatments or cures (quotations not shown). Participants also had several practical concerns, including where to get tested or vaccinated, how to follow up on negative test results, whether the vaccine confers lifelong protection, what population subgroups need to be vaccinated, whether there are employer regulations against those with hepatitis B, and whether there are immigration laws against individuals with hepatitis B (Table 2). At the focus groups' conclusion, several participants expressed appreciation and were grateful to have taken part. Participants were given informational brochures about hepatitis B, and many took extra copies to distribute to friends and family members.

Discussion

Through a series of focus groups among Bay Area Chinese Americans, we identified a range of factors that motivate individuals to undergo hepatitis B testing and vaccination, as well as inform family and friends about these preventive activities. Likewise, we gathered information on factors that deter people from engaging in these actions. Attitudes toward preventive health behaviors in general, including flu vaccination, were similar to attitudes toward prevention of hepatitis B and liver cancer in particular. For the most part, motivations and deterrents were highly practical: individuals were driven by concerns about health and disease, limitations on time and money, professional expertise, and scientific evidence. Personal beliefs and independently held opinions, as well as responsibilities toward family, friends, and society, also played important roles in affecting preventive health decisions.

Currently, the Advisory Committee on Immunization Practices (ACIP), which develops federal recommendations for routine administration of vaccines to the US population, recommends that all foreign-born persons from Asia, the Pacific Islands, and other regions with intermediate or high endemicity of hepatitis B virus (HBV) should be tested for hepatitis B (Centers for Disease Control and Prevention (CDC), 2008). The vaccine should then be administered to those who are found not to be protected and who seek protection from hepatitis B, travel to HBV-endemic areas, or have close contact with chronically infected individuals, among other risk factors. However, this policy is not widely implemented, for reasons that likely include the lack of universal health care in the US, the variability of insurance plans in covering the hepatitis B test and vaccine, and the poor awareness of the ACIP recommendations among health professionals and the public. As a result, most APIs have not undergone hepatitis B testing or vaccination, and many health care providers do not routinely recommend these procedures to their API patients (Taylor et al., 2002; Thompson et al., 2002; Taylor et al., 2004; Taylor et al., 2005; Taylor et al., 2005; Choe et al., 2006; Taylor et al., 2006; Ma et al., 2007; Ma et al., 2007; Wu et al., 2007). Thus, improving hepatitis B knowledge among APIs and their health care providers is an essential step toward nationwide adoption of the ACIP guidelines.

To design effective community-based intervention programs promoting hepatitis B and liver cancer awareness and prevention among Chinese Americans and possibly other API groups, it is important to account for the motivations and deterrents identified in our study. For instance, basic statistics about the prevalence of chronic hepatitis B, the risk of subsequent liver disease and death, and the disparity in chronic hepatitis B and liver cancer between APIs and non-APIs, could address concerns about health and disease. Provision of free or low-cost hepatitis B screening and vaccinations, facilitated through partnerships with public health departments, pharmaceutical companies, hospitals, and community-based organizations, could help to allay worries about the costs, insurance coverage, and convenience of these procedures (as an example, see http://sfhepbfree.org). Public health campaign messages could emphasize that hepatitis B screening and vaccination protect the health of not only the individual, but also his or her family members and other loved ones, and that promoting hepatitis B and liver cancer awareness and prevention is a service to the overall API community. Finally, it should be publicized that official US guidelines already recommend hepatitis B testing for all foreign-born persons from Asia and the Pacific Islands, and vaccination for those who are unprotected (Centers for Disease Control and Prevention (CDC), 2008). These guidelines lend the weight of professional and scientific authority to any community-based hepatitis B and liver cancer prevention program for APIs. Because second-generation APIs are also at elevated risk of chronic hepatitis B due to vertical transmission from infected mothers (Shepard et al., 2006), US-born APIs should likewise be tested for hepatitis B.

Several other important issues raised by our focus group participants are also worthy of attention. If a community-based intervention program does not provide free or low-cost testing and vaccination, then it should provide clear, readily available information about where to obtain these services, especially without health insurance, as well as whether they are covered by various common health insurance plans and what they cost out-of-pocket. Individuals who do have health insurance need to be informed that hepatitis B testing is not typically performed on a routine basis by primary care physicians; thus, it should be requested specifically from one's doctor. In addition, physician education about the rates, risks, transmission, prevention, and clinical management of hepatitis B and liver cancer, and especially the disproportionate burden of disease among APIs, can help to improve patient-doctor communication about these issues.

Our study has some limitations to consider. First, focus group participants were self-selected volunteers, and therefore are not a representative sample of Chinese Americans in the Bay Area or the overall US. We aimed to be inclusive by holding focus groups in Cantonese, English, and Mandarin. However, participants were older,

more likely to be foreign-born and married, and of lower socioeconomic position (based on education, income, and employment) than the general Chinese American population of the Bay Area (United States Census Bureau, 2003). The socioeconomic differences may be attributed in part to the fact that individuals were offered a small stipend for participating. Being predominantly foreign-born and of lower socioeconomic position may have caused our study participants to be more concerned about poor doctor-patient communication, financial costs, and employment and immigration regulations than the general population. Also, some of their viewpoints, such as the importance of preserving group harmony, being family-centered, and defining oneself in terms of social and ethical responsibilities, may have been more reflective of traditional Chinese culture than Chinese American culture (Gao and Ting-Toomey, 1998). On the other hand, it is most important to assess beliefs among foreign-born Chinese Americans (who comprise two-thirds of Chinese in the Bay Area and in the overall US (United States Census Bureau, 2008)) because those born in Asia have the highest risk of chronic hepatitis B (Centers for Disease Control and Prevention (CDC), 2008; Lin et al., 2007). Furthermore, our findings regarding concerns about hepatitis B vaccination and its potential side effects, as well as general preventive health strategies, were consistent with those reported in semi-structured interviews and focus groups by Chinese American adults in Seattle, Washington, and Vancouver, British Columbia (Chen et al., 2006), suggesting at least some comparability with Chinese Americans elsewhere in North America.

Likewise, our study population of Chinese Americans is not representative of all API subgroups, and some cultural beliefs and practices are likely to differ among these diverse populations. Still, we found that participants in our focus groups expressed beliefs (including misconceptions) about routes of hepatitis B transmission, causes of liver cancer, and prevention of both these diseases (data not shown) that were similar to those expressed by Korean Americans in western Washington (Choe et al., 2005), indicating some parallels between different API subgroups. Another limitation of our study is that coding and data analysis of focus group transcripts were based in part on subjective decisions, and some interpretations may therefore have been influenced by the investigators' preconceptions. Finally, focus groups provide a limited view of a group's beliefs and practices, and do not offer a broad assessment of cultural context.

Nevertheless, this study is, to our knowledge, the first to assess attitudes that motivate or discourage hepatitis B and liver cancer preventive activity among Chinese Americans. Our findings contribute novel and valuable information toward the planning and implementation of effective community-based programs, as well as the design of educational outreach materials, to increase awareness and prevention of hepatitis B and liver cancer in Chinese Americans, and possibly other API groups. For example, the informational brochures produced by the Asian Liver Center at Stanford University (publicly available at http://liver.stanford.edu/Edu/Edu_materials.php) are tailored to address the priorities, concerns, and questions raised by our focus group participants. With APIs representing the fastest-growing racial group in the US (United States Census Bureau, 2004), and most APIs being immigrants from Asia or the Pacific Islands or the children of foreign-born parents (United States Census Bureau, 2003), chronic hepatitis B and liver cancer are likely to grow as a major public health problem unless effective prevention programs are put into action. Therefore, this study is an important first step toward developing and launching such programs, with the ultimate goal of eradicating hepatitis B and preventing thousands of hepatitis-B-related deaths each year.

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