RESEARCH ARTICLE

Education and Counseling of Pregnant Patients with Chronic Hepatitis B: Perspectives from Obstetricians and Perinatal Nurses in Santa Clara County, California

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Abstract

Background: This study aimed to better understand the barriers to perinatal hepatitis B prevention and to identify the reasons for poor hepatitis B knowledge and delivery of education to hepatitis B surface-antigen-positive pregnant women among healthcare providers in Santa Clara County, California. Materials and Methods: Qualitative interviews were conducted with 16 obstetricians and 17 perinatal nurses in Santa Clara County, California, which has one of the largest populations in the United States at high risk for perinatal hepatitis B transmission. Results: Most providers displayed a lack of self-efficacy attributed to insufficient hepatitis B training and education. They felt discouraged from counseling and educating their patients because of a lack of resources and discouraging patient attitudes such as stigma and apathy. Providers called for institutional changes from the government, hospitals, and nonprofit organizations to improve care for patients with chronic hepatitis B. Conclusions: Early and continuing provider training, increased public awareness, and development of comprehensive resources and new programs may contribute to reducing the barriers for health care professionals to provide counseling and education to pregnant patients with chronic hepatitis B infection.

Keywords: Hepatitis B - provider education - qualitative study

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Introduction

Chronic hepatitis B is a serious liver disease that affects 800,000-1.4 million people in the United States. Because hepatitis B is mainly asymptomatic, 65-75% of infected Americans are unaware of their disease status and therefore do not receive proper care (Institute of Medicine, 2010). Without appropriate treatment or management, one in four people chronically infected with hepatitis B will die prematurely from liver cancer or cirrhosis (World Health Organization, 2012). Asians and Pacific Islanders (APIs) are disproportionately affected; one in 12 APIs is chronically infected with hepatitis B in comparison to 1 in 1000 non-Hispanic whites (Wasley et al., 2010).

A primary route of hepatitis B virus (HBV) infection is perinatal transmission from infected mothers (Centers for Disease Control and Prevention, 2005). Newborns are particularly vulnerable to developing chronic hepatitis B. Without appropriate prophylaxis, as many as 90% of infected infants develop chronic infection (Shepard et al., 2006). The administration of one dose of the hepatitis B vaccine and hepatitis B immune globulin within 12 hours after birth, followed by the completion of the vaccine series, is 89-98% effective in preventing HBV infection in infants born to chronically infected women (Greenberg, 1993). Thus, the time of birth is the best opportunity to prevent vertical transmission of HBV.

Despite the existence of an effective and safe method of prevention, approximately 1000 infants still develop chronic hepatitis B every year through perinatal transmission (Centers for Disease Control and Prevention, 2005). Part of the failure to eliminate perinatal transmission of hepatitis B in the U.S. is rooted in poor prenatal medical management of pregnant women who test positive for hepatitis B surface antigen (HBsAg), a marker of chronic hepatitis B. While over 95% of pregnant women are screened for HBsAg during a prenatal visit, fewer than half of the 24,000 expected births to HBsAg-positive women each year are identified for case management, which can ensure high levels of initiation and completion of post-exposure immunoprophylaxis for newborns (Euler et al., 2003; Jacques-Carroll, 2008).

Using self-administered surveys in our larger study, we found low levels of hepatitis-B-related knowledge and poor adherence to standard preventive clinical practices among obstetricians and perinatal nurses in Santa

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Clara County, California, which has one of the nation's largest populations at high risk for perinatal hepatitis B transmission (Chao et al., 2012). However, these survey data failed to capture reasons for such low knowledge and adherence to standard clinical preventive guidelines. To better understand the barriers to perinatal hepatitis B prevention, we designed a qualitative study to investigate reasons for poor hepatitis B knowledge and delivery of education to HBsAg-positive pregnant women among healthcare providers in Santa Clara County.

Materials and Methods

Participant recruitment

A total of 16 obstetricians and 17 perinatal nurses were recruited into this study through letters, flyers, and in-person recruitment at four of the ten birthing hospitals in the county. A snowball technique was employed with which participants were encouraged to inform their colleagues about the study. Based on prior qualitative research on provider-patient communication and education (Navar et al., 2007), we targeted a sample size of 15 obstetricians and 15 perinatal nurses. Although the saturation point was met before the estimated number of interviews had been conducted, additional interviews were conducted to purposively sample the birthing hospitals in Santa Clara County and to verify the themes, categories, and theories that had emerged from the already collected data. The study was approved by associated institutional review boards.

Santa Clara County was selected as the study site because it has one of the nation's largest populations at risk for perinatal hepatitis B transmission. As home to one-third of the nation's API population, the state of California accounts for approximately one-quarter of infants born to HBsAg-positive women in the United States (Jacques-Carroll, 2005; United States Census Bureau, 2010). In particular, the Bay Area has the highest concentration of the APIs in the continental United States, and Santa Clara County has the second-highest annual number of infants born to HBsAg-positive women in California (Center for Infectious Diseases, 2008).

Data collection

From June 2009 to March 2011, semi-structured, face-to-face interviews were conducted in hospitals with 33 participants. Interviews were conducted by the same interviewer (EJY) to reduce bias due to interviewer variability. Participants provided written informed consent before the interviews, which lasted 30-45 minutes, and received a token $20 gift card. Interviews were recorded and then transcribed verbatim. The interviewer took notes throughout the interviews, and recorded impressions at the conclusion of each interview.

The interviewer followed a script to ensure sufficient structure to cover the topics of interest. Questions in the script were open-ended and designed to elicit candid beliefs, attitudes, and opinions about topics such as barriers to providing hepatitis-B-related education and public awareness of hepatitis B. The interviewer also asked unscripted probe questions to encourage participants to elaborate upon unexpected or underdeveloped topics.

Data organization and analysis

The data were analyzed in accordance with grounded theory in which categories, themes, and eventually theory were allowed to emerge from the interview data (Glaser et al., 1967). The computerized qualitative data analysis program NVivo was used to organize transcripts; code; sort and cluster codes; and retrieve exemplary raw quotes that illustrated emerging concepts in the data. Data were continuously analyzed during data collection to assess whether the information gathered from new interviews added additional information to the existing data (Miles and Huberman, 1994).

In the original steps of analysis, the transcripts were read multiple times with the goal of gaining familiarity with the data, and absorbing and noting recurrent phenomena. The data were then coded in two phases (Table 1). The first phase consisted of open, line-by-line coding during which codes were applied to micro-phenomena such as words, phrases, and sentences. For example, the code "other disease" was applied to instances when the participants compared attitudes toward hepatitis B to those toward another disease such as HIV or influenza. The second phase of coding emphasized breaking down codes, combining codes within categories, and assigning metaphorical and in vivo codes. Throughout both phases of coding, all codes were recorded in a chart that catalogued the definitions, types, and frequencies of the applied codes, and analytic memos were used to record thoughts, explore relationships between codes, elaborate upon emerging themes or patterns, and document analytic decisions. The coding process was finished when all of the incidents were readily classified and the categories were saturated.

Upon completion of the coding process, the data were organized into several matrices, including a role-ordered matrix, to understand the nurses' and obstetricians' roles in the delivery of hepatitis B education and a meta-matrix to standardize the descriptive data about the factors that affect the delivery of health education. Additionally, a causal network was created to explore the relationships among the various variables in the delivery of education to HBsAg-positive patients. These matrices and causal network allowed for cross-case analysis and a comprehensive view of the data. Thus, coherent conclusions could be drawn about the general delivery of hepatitis B education to HBsAg-positive mothers in Santa Clara County and not incidents isolated to one case.

The assignment of codes and the development of themes and conclusions were verified through periodic meetings with other members of the research staff and an expert in qualitative research. Additionally, transcripts were compared to field notes to provide consistency in the interpretation of the data.

Results

Participant demographics

As shown in Table 2, all obstetricians but one were female and evenly distributed across age groups (mean and median=44 years). Most obstetricians identified

themselves as API (n=9, 56%) or non-Hispanic White (n=6, 38%), and the average duration of employment was 17 years (range=5-34 years). All nurses were female and fairly evenly distributed across age groups (mean and median=42 years). Most nurses identified themselves as API (n=10, 59%) or non-Hispanic White (n=7, 41%); the average duration of employment was 16 years (range=1-34 years).

In all interviews, the participants described themselves as important sources of hepatitis-B-related information and believed that they were responsible for educating all of their patients, especially HBsAg-positive patients. In particular, they noted that prenatal visits present a unique opportunity for an exchange of dialogue about hepatitis B, as pregnant patients are especially attentive about the health of their fetus (Table 3). However, the obstetricians and nurses consistently expressed low self-efficacy in their ability to educate their patients about hepatitis B because of their own lack of knowledge. Therefore, they chose not to educate their patients directly out of fear of communicating incorrect or misleading information. Some, instead, chose to distribute handouts or brochures and not discuss the content with their patients, while others did not provide any hepatitis-B-related information (Table 3).

Poor preparation during medical/nursing school: The participants mainly attributed their lack of knowledge to poor preparation during medical or nursing school. All obstetricians and nurses expressed that they received little, if any, hepatitis-B-related education during medical or nursing school, training, and employment. The participants remembered that hepatitis B was mentioned only in passing as "part of a segment on viruses" or "maybe the liver section." None could remember learning about the epidemiology of hepatitis B, and the disease was never discussed in the context of racial health disparities. Furthermore, the participants received little patient-focused education about hepatitis B during employment (Table 3).

Medical hierarchy: Obstetricians younger than 40 years spoke about the discordance between the rapid development of new medical information and the professional hierarchy within the medical field. In a field where research is constantly leading to new discoveries about medical information and developments in medical procedures, senior doctors often determine what medical students and residents learn and how they are trained. However, the participants expressed frustration with this system, as they perceived senior doctors to be out-of-date with respect to current medical research and knowledge (Table 3).

Another theme that emerged from the interviews was the agency that healthcare providers place on patients in determining the delivery of hepatitis-B-related

Table 2. Demographic Characteristics of Obstetricians (n=16) and Nurses (n=17) in Santa Clara County, California

Characteristic		Obstetricians n (%)	Nurses n (%)
Age group (years)			
	<35	2 (12.50)	4 (23.50)
	35-44	6 (37.50)	5 (29.40)
	45-54	5 (31.25)	4 (23.50)
	>55	3 (18.75)	4 (23.50)
Sex	Female	15 (93.75)	17 (100)
	Male	1 (6.25)	0 (0)
Race/ethnicity			
	Asian/Pacific Islander	9 (56.25)	10 (58.80)
	White, non-Hispanic	6 (37.50)	7 (41.20)
	Other	1 (6.25)	0 (0)
Years of experience			
	0-9	4 (25.00)	6 (35.30)
	10-19	6 (37.50)	3 (17.65)
	20-29	4 (25.00)	5 (29.40)
	30-39	2 (12.50)	3 (17.65)

Table 1. Sample of Coding Chart

Code	Definition	Type	Example	Frequency
OTHER DIS	Mention of another disease throughout the interview (does not only have to be a comparison)	Descriptive	"In terms of vaccines, we talk about the flu vaccine during flu seasons, but we don't really talk about the hepatitis B vaccine unless their partner is positive for hepatitis B."	11/15 OB 6/15 N
CULT	Any mention of culture throughout the interview (i.e., cultural competency, cultural sensitivity, description of patient's cultures, etc.)	Descriptive	"I don't know how culturally appropriate our materials are. They're pretty standard. I don't think we have anything tailored for different populations."	7/15 OB 7/15 N
SHORT	Fixation on the immediate health concerns rather than long term health issues such as chronic diseases	Interpretive	"We don't usually have that much time with the mother to spend talking about long term health. You have to remember that we deal with people that cry and complain which makes sense because they're in pain. So it's different. Shortly after delivery, we try to initiate breast feeding, and we try to do the charts so we don't have that much time."	1/15 OB 12/15 N
"HORSE"	The provision of education does not necessarily translate into beneficial behaviors by the patients	In vivo/ metaphorical	"I mean you can try to tell me the information again and again, but I don't know how much they're going to do with what we tell them. You can bring the horse to the bucket, but you can't force them to drink."	0/15 OB 5/15 N
PRIORITY	Prioritizing one aspect of health over another	Descriptive; Interpretive	"I think they're usually more curious and concerned about their immediate health risks and the risks for the baby [than chronic hepatitis B]."	14/15 OB 13/15 N

Table 3. Quotes on Theme 1: Lack of Self-efficacy

Description	Quote
Opportunity for exchange of dialogue about hepatitis B	
	"I know that when they first come in for their prenatal visit, that's the best time to discuss something like hepatitis B because that's when it hits them the most. That's when they retain the most because they're pregnant; they want to make sure their babies are okay."
Providing hepatitis B related information	
	"I don't feel particularly comfortable about educating patients about hep[atitis] B because I don't have the information."
Poor preparation during medical/nursing school	
	"I don't really remember being ever taught that hepatitis B was such a huge public health threat. We were never told that it was so much more widespread than HIV/AIDS, and we never knew that so many people had it. If anything, I just remember being taught how infectious it was and how easy it was for healthcare providers to get it if they weren't vaccinated. It was as if hepatitis B was only a threat for healthcare providers."
Medical hierarchy	*"A lot of medicine is about the hierarchy. The older doctors who have been doing it the longest are the ones on top so they have the biggest say in what we learn and how learn it. But they're the ones who have been out of med school the longest, and they're so set in their ways that were up-to-date 20 years ago but not today. I mean this hierarchy isn't unique to medicine, but look at*

Table 4. Quotes on Theme 2: Patient "Cues"

Description	Quote
Patient cues	*"It's not like I just say whatever I want. I try to get to know them so I know what they want to know about and what they think is important. I look for certain cues."*
Stigma	*"She didn't want me to talk about it in front of her husband because she was scared of the mother-in-law. So I tried to be discreet, but it was hard to talk about it when she didn't even want to hear it."*
Apathy	*"If the patients are not concerned, I usually don't have time to explain what hepatitis B is fully to them because there just isn't time. I'm not going to waste their time and my time on something they're not really concerned about."*
Patients' preferential concern for short-term health issues	
	"We don't usually have that much time with the mother to spend talking about long-term health. You have to remember that we deal with people that cry and complain, which makes sense because they're in pain. So it's different. Right after delivery, we try to initiate breastfeeding and we try to do the charts, so we don't have that much time."
Doubt about the efficacy of patient education	
	"We have to be realistic. Do I think enough is being done? I hope so. I mean you can try to tell me the information again and again, but I don't know how much they're going to do with what we tell them. You can bring the horse to the bucket, but you can't force them to drink."

information. The obstetricians and nurses said they depend on what one obstetrician described as "cues" from their patients to determine whether or not to educate them about hepatitis B (Table 4). The cues discussed throughout the interviews were varied and were closely related to the knowledge, attitudes, and behaviors displayed by the patients.

Patients' pre-existing awareness of hepatitis B: A subtheme that emerged consistently in the obstetricians' and nurses' narratives was patients' pre-existing awareness of hepatitis B. All participants noted that very few patients were already educated about hepatitis B. However, they observed a trend in which the patients who are more knowledgeable about hepatitis B are more highly educated or had personal experiences with hepatitis B (e.g., had lost a family member or a friend to hepatitis-B-induced liver cancer). Some obstetricians said that they are more inclined to discuss hepatitis B with patients with high levels of awareness because "it's easier to answer questions than give an entire spiel about hepatitis B that just makes them ask more questions when there's already not enough time."

Stigma: The subtheme of stigma also emerged consistently throughout the interviews. The obstetricians and nurses perceived a stigma attached to hepatitis B that made patients reluctant to receive information and/or to encourage their sexual contacts and family members to be tested for hepatitis B. This sense of stigma made the participants wary of openly discussing hepatitis B with their patients, especially if the patients were accompanied by other people. For example, one obstetrician shared an experience during which a patient specifically asked her not to mention the patient's HBsAg-positive status in front of her husband (Table 4).

Apathy: The obstetricians, in particular, described some of their API patients as apathetic about hepatitis B due to the fact that it is so common in their native population, and attributed their patients' apathy to misunderstanding their diagnosis and the potential sequelae of the disease. These patients often did not know what hepatitis B was and, as a result, did not feel concerned about their HBsAg-positive status. The sense of apathy among their patients actively played a role in the obstetricians' decisions to educate their patients (Table 4).

Patients' preferential concern for short-term health issues: Several sub-themes emerged that were specific to the narratives of the nurses. Most nurses described delivery and subsequent hospitalization as a hectic time

Table 5. Quotes on Theme 3: Environmental Factors

Description	Quote
Time	*"It's also so busy, busy, busy. There's never enough time for one more thing."*
Lack of educational resources	*"We don't have any materials on hand. We have to go somewhere and get something, but I don't really know where, and I usually don't have the time. I think we might be supposed to ask infectious diseases, but that's far away."*
Importance of educational resources	*"It needs to be written down because we can tell the patients that they need to come in later to complete the vaccination series, but there's no way the moms are going to remember that after dealing with screaming, crying babies. It also needs to be in the right languages. In the hospital, we can use a translator, but I'm assuming all of these women don't have personal translators at home."*
Importance of accurate educational resources	*"You know, with more people on the internet, everything is going global now. It's dangerous because there are crazy people who post things like vaccines cause autism. But then it can also be a good thing if there's info about hep[atitis] B and the vaccine and how much kids need it online. Then the doctors need to tell their patients what's right and what's wrong from the internet."*
Failures in the system	*"I know that [an HMO] keeps these asthma registries, and every time their patients need to go in for a check-up, [the HMO] calls them. Couldn't the government or insurance company do the same thing for hep[atitis] B vaccines or the 6-month visits for people with hep[atitis] B?"*

during which patients were mainly concerned about immediate issues such as bathing the infant or initiating breastfeeding. Because of the short period of time that the nurses shared with their patients, they often mentally created a list of priorities that was heavily dictated by the patients' preferences. As a result, many nurses felt forced to forgo discussions about long-term health issues such as chronic hepatitis B (Table 4).

Doubt about the efficacy of patient education: The nurses also expressed concern that education did not necessarily translate into changed behaviors or preventive measures (Table 4). After repeated experiences with patients "ignoring us," many nurses expressed feeling jaded and wary of any initiatives that focused purely on education. While they felt that it is important to educate their patients, they also stated that "[their] educating them alone isn't going to change everything and make everyone better."

The final theme that emerged from the obstetricians' and nurses' narratives was environmental factors that prevented them from providing hepatitis-B-related education to their patients. Such environmental factors were often viewed as being outside the participants' control and responsibility.

Time: The most commonly cited environmental factor cited by the obstetricians and nurses as preventing them from educating patients about hepatitis B, as evident in several preceding quotes, was a lack of time with the patients (Table 5).

Educational resources: A majority of the participants did not routinely distribute hepatitis B educational materials to their patients. Attitudes towards the educational materials included unfamiliarity, confusion, and frustration. The obstetricians and nurses were either unfamiliar with the contents of the materials that they distributed or felt that the materials provided only cursory information. The nurses, in particular, expressed confusion about hospital policies and procedures regarding hepatitis-B-related education and did not know the location of educational materials within the hospital (Table 5). Despite the unavailability or poor quality of the materials, participants believed that it was important to give physical resources to patients to reinforce verbal education. In doing so, the obstetricians and nurses were able to provide a resource that patients could reference again at home and disseminate to their friends and family (Table 5).

The nurses particularly emphasized the heightened need for accurate information in light of the increasing number of patients refusing vaccinations for their infants. Several noted that they had encountered HBsAg-positive patients who had refused administration of the hepatitis B vaccine and HBIG for their infants. While the nurses expressed frustration with these women, they were ultimately concerned about the infants' health and portrayed these women as victims of false information. The obstetricians and nurses concluded that the role of healthcare providers as educators is quickly evolving in the age of the internet and user-written content. Healthcare providers now have to ensure that patients are receiving accurate information (Table 5).

"Failures in the system": The obstetricians and nurses also shared frustrations with "failures in the system" at various levels including the policies and practices of hospitals, governments, insurance companies, and even nongovernmental organizations. The participants often drew parallels between responses to hepatitis B and responses to other diseases, most frequently citing HIV/AIDS and the flu. In doing so, they called for new laws addressing hepatitis B and improved programs for the surveillance, monitoring, and treatment of people chronically infected with hepatitis B (Table 5).

Discussion

The U.S. Department of Health and Human Services recently identified the elimination of perinatal hepatitis B transmission as a priority in its action plan for the prevention, care, and treatment for viral hepatitis (United

States Department of Health and Human Services, 2012). However, we recently found poor adherence to standard preventive clinical practices and low levels of knowledge about hepatitis B among perinatal healthcare providers who should be leaders in the effort to achieve that goal (Chao et al., 2012). In this follow-up qualitative study to identify the reasons for such low adherence to preventive clinical practices among obstetricians and nurses, we discovered 3 major themes: 1) lack of self-efficacy in providing hepatitis-B-related education; 2) patient "cues" that determine the content and direction of patient-provider communication; and 3) environmental barriers perceived as being outside of the providers' control and responsibility.

Our results highlight the need for improved, ongoing education and training for perinatal healthcare providers. Many obstetricians in our study noted that the prenatal visit is the ideal time for education and counseling of HBsAg-positive women, since patients are then attentive and eager to learn about protecting the health of their infants. Previous research has shown that increased provider knowledge about viral hepatitis is correlated with improved delivery of preventive services (Lai et al., 2007; Zickmund et al., 2007). Our study suggests that one mechanism through which increased knowledge leads to improved practices may be increased self-efficacy. Physicians are the most trusted sources of cancer information among Asian Americans (Nguyen and Bellamy, 2006), but many physicians in our study chose not to educate their patients about hepatitis B due to low self-efficacy attributed to poor education and training. As a result, they felt discouraged to educate and counsel their patients even though they knew it was part of their responsibility. Thus, our research suggests that provider education should be initiated early in health professional school and continued throughout the providers' careers to improve self-efficacy. Previous research in smoking cessation has suggested that physicians with tobacco-related medical education were more confident in advising parents about the effects of second-hand smoke on their children. In particular, physicians with continuing medical education were more likely to report confidence in tobacco-related skills and to practice more interventions than physicians with other forms of training (Victor et al., 2010).

With appropriate training, providers may be encouraged to continue educating and counseling their patients, even when patients display discouraging behaviors such as apathy or stigma towards hepatitis B. Providers were highly influenced by the knowledge, attitudes, and behaviors of their patients in their decisions to provide counseling and education. In regards to the stigma and apathy displayed by their patients, the providers believed that both stemmed from a lack of awareness of hepatitis B among the general public. Thus, improved provider education and training should be supplemented by hepatitis-B-related education and awareness campaigns targeted toward at-risk populations, where hepatitis B awareness is low and education about chronic disease management is needed (Taylor et al., 2006; Ma et al., 2007; Wu et al., 2007). As highlighted by the providers, such health education must extend beyond traditional brochures and handouts to include accurate, comprehensive websites, as these are now a major source of health information for patients.

Our study also highlighted the need for the development of effective, culturally competent educational resources about hepatitis B. 36% of APIs have limited English proficiency, and 25% of Asian American households are linguistically isolated, meaning that they lack an English-speaking household member who is older than 14 years (Asian and Pacific Islander Health Forum, 2012). Limited proficiency in English has previously been identified as an important barrier to the effective management of chronic hepatitis B (Tran, 2009), and our study reveals that it is also a barrier to the prevention of perinatal HBV transmission. Many obstetricians and nurses noted a lack of multilingual educational materials that targeted the issue of perinatal hepatitis B. The participants believed that the development of comprehensive materials was especially important because such resources were important aids in hepatitis B prevention and management. Furthermore, the distribution of such materials should be incorporated into the standard of care to ensure that providers are consistently following ACIP guidelines to counsel and educate their patients about hepatitis B prevention and management.

Finally, the participants repeatedly called for institutional changes within the government, hospitals, and insurance companies to support hepatitis B prevention, management, and treatment. In doing so, the participants frequently drew on successful approaches to other diseases such as HIV or influenza. For example, the participants described the inadequacy of hepatitis B surveillance within the government and insurance companies in comparison to HIV or influenza surveillance. As confirmed by the recently released IOM report on viral hepatitis, the surveillance system for viral hepatitis in the United States is poorly funded, incomplete, inadequate for follow-up of recently diagnosed cases, and insufficiently informative for policymakers to best allocate resources for viral hepatitis prevention and control programs (Institute of Medicine, 2010). The data from this study reinforce that improved provider education must be supplemented by policy and institutional changes to provide better care for patients with chronic hepatitis B.

Some limitations of our study should be considered. The data were collected from a sample of obstetricians and nurses that was not representative in race, gender, or perhaps professional background, and might not reflect the wider range of perspectives of healthcare providers of more diverse backgrounds. Another limitation is that while our questions were developed after research on effective qualitative study and interviewing, the script was not validated through a separate study (Patton, 1990). Also, as is characteristic of qualitative studies, the sample size was small, and the results were specific to Santa Clara County with limited generalizability. However, Santa Clara County was in many ways an ideal location for this study, as it has one of the nation's largest populations at risk for perinatal hepatitis B transmission.

In summary, we identified several barriers to adherence

to the standard preventive clinical guideline of educating and counseling HBsAg-positive women with the goal of preventing perinatal HBV transmission. Many providers displayed a lack of self-efficacy as a result of poor training and education, and were also discouraged from counseling and educating their patients as a result of discouraging patient attitudes and a lack of resources. Further research is needed to develop new mechanisms of education and training for providers and educational resources and public awareness campaigns for patients. Through further research and development, both providers and patients can be empowered with the knowledge, skills, and attitudes to prevent perinatal transmission of hepatitis B and promote long-term care of hepatitis B among HBsAg-positive women.

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