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Presented by the Johns Hopkins University School of Medicine and the Institute for Johns Hopkins Nursing
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VOLUME 2 — ISSUE 4: TRANSCRIPT

Featured Cases: Hepatitis B & Pregnancy

Our Guest Author is Tram T. Tran, MD, Medical Director of the Liver Transplantation Program at the Liver Disease and Transplant Center at Cedars-Sinai Medical Center in Los Angeles, and Associate Professor of Medicine at the David Geffen School of Medicine at UCLA.

After participating in this audio activity, the participant will demonstrate the ability to:

- Review current screening recommendations for hepatitis B,
- Assess strategies to reduce mother-to-child transmission (MTCT) of hepatitis B, and
- Review recommendations for breastfeeding and vaccination in hepatitis B infected mothers.

This discussion, offered as a downloadable audio file and companion transcript, covers the important issues related to hepatitis B and pregnancy in the format of case-study scenarios for the clinical practice. This program is a follow up to the Volume 2, Issue 3 eViralHepatitis Review newsletter—Hepatitis B & Pregnancy.

Unlabeled/Unapproved Uses
The author has indicated that her presentation will include discussion of the off-label or unapproved uses of tenofovir, entecavir, telbivudine, and lamivudine.

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Faculty Disclosure
Dr. Tran has disclosed that she has served as a consultant/advisor for Gilead Sciences and Bristol-Myers Squibb.

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CME INFORMATION

⇩ PROGRAM BEGINS BELOW

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MR. BOB BUSKER: Welcome to this *eViralHepatitis Review* Podcast.

eViralHepatitis Review is presented by The Johns Hopkins University School of Medicine and The Institute for Johns Hopkins Nursing. This program is supported by educational grants from Gilead Sciences and Vertex Pharmaceuticals.

Today's program is a companion piece to our Volume 2, Issue 3 eViral Hepatitis Review newsletter: Hepatitis B & Pregnancy

Our guest is that issue's author, Dr. Tram T. Tran from the Cedars-Sinai Medical Center in Los Angeles.

This activity has been developed for hepatologists, infectious disease specialists, primary care physicians, nurses, and nurse practitioners. There are no fees or prerequisites for this activity.

The Accreditation and Credit Designation Statements can be found at the end of this podcast. For additional information about accreditation, Hopkins policies, and expiration dates, and to take the post-test to receive credit online, please go to our website newsletter archive, www.eviralhepatitisreview.org, and click on the Issue 4 podcast link.

Learning objectives are that after completing this activity, the participant will demonstrate the ability to:

- Describe the current screening recommendations for hepatitis B,
- Assess strategies to reduce mother-to-child transmission of hepatitis B, and
- Summarize recommendations for breastfeeding and vaccination in hepatitis B-infected mothers.

I'm **BOB BUSKER**, managing editor of eViralHepatitis review. Our guest today is Dr. Tram T. Tran, Medical Director of the Liver Transplantation Program at the Liver Disease and Transplant Center at Cedars-Sinai Medical Center in Los Angeles and Associate Professor of Medicine at the David Geffen School of Medicine at UCLA.

Dr. Tran has disclosed that she has served as a consultant/advisor for Gilead Sciences and Bristol Myers Squibb.

Her presentation today will include discussion of the off-label or unapproved uses of tenofovir, entecavir, telbivudine, and lamivudine.

Dr. Tran, welcome to this eViralHepatitis Review Podcast.

DR. TRAM T. TRAN: Thank you very much for having me here today.

MR. BUSKER: In your newsletter issue, Dr. Tran, you reviewed a variety of key findings on hepatitis B and pregnancy. I'd like to discuss how clinicians can apply that information in the exam room. So please start by presenting a patient.

DR. TRAN: Let's talk about a typical case we might see. I have a 28-year-old Chinese female who has been seen in the past for routine health care and she reports that she's been vaccinated for hepatitis B in the past. No other complaints; she feels well; she's a young, healthy woman; she has no medical history. Of note socially, she's a dentist; she's newly married; she has no children; and she immigrated to the United States at age 14 from China.

Her family history is significant in that her father died in China at age 55 of some "unknown liver problem." Her physical exam, as you would expect for a 28-year-old woman, is unremarkable. So when we talk about her overall presentation, she would be someone we would think might have some risk factors that we would need to talk about more.

MR. BUSKER: Let's begin there, with her risk factors.

DR. TRAN: I think when you see any patient that comes from a highly endemic area of the world, China being one of them, that we know is a risk factor for hepatitis B, and the CDC's 2008 recommendations that we should screen all patients from an endemic area.

She also has another risk factor in that she has a family history of some sort of liver problem, so I think those are all important risk factors that we need to keep in mind.

I do want to note that it's really common that patients come in and say they've been vaccinated for

hepatitis B, so they think that they are protected from hepatitis B; however, if you are hepatitis B-positive and you get vaccinated, the vaccine won't work because you are already positive. So in this case, this young woman who is from a highly endemic area may already be positive for hepatitis B, and just receiving the vaccine series doesn't really do anything to change her disease course.

It's also important to note that CDC in 2008 recommended that children born to parents from highly endemic areas need to be screened for hepatitis B. That doesn't necessarily apply to her because she was actually born in China, but it's something to keep in mind in overall risk stratification.

MR. BUSKER: Given those risks that you just outlined, what would you recommend for her in terms of HBV screening and management?

DR. TRAN: For this young woman, we would obviously screen for hepatitis B with a hepatitis B surface antigen. And not surprisingly, since approximately 10% of individuals from this area may be hepatitis B-positive, she turns out to be hepatitis B surface antigen-positive.

In assessing her overall liver disease and liver function, we note that her ALT is 20, which is relatively normal. She has normal liver function with a normal INR, and her CBC and other labs also appear unremarkable.

When we look at whether she needs treatment, we can look at the AASLD treatment guidelines, and at this time the treatment guidelines suggest that with a normal ALT — and you may repeat that and continue to follow that to make sure that it stays normal — but someone with a persistently normal ALT would not be a candidate for treatment for her disease at this time. But you do want to keep in mind that this young woman does have a family history of some liver problem in that her father died at a young age from, so you would continue to monitor her pretty closely and make sure that she doesn't subsequently become a candidate for therapy.

So at this point she is surface antigen-positive, meaning she has chronic hepatitis B, but her liver enzymes are normal, and you may further assess her disease at some point in the future, as well.

MR. BUSKER: Let's fast-forward into the future with this patient. As you said, she's newly married. Now its two years later and she's pregnant, in her first trimester. Her OB/GYN runs an HBV screen and it's positive. What should be done now?

DR. TRAN: She's coming back two years later and is now positive again, as you would have expected, still being positive in the first trimester screening in pregnancy. Our OBs are very good at doing first trimester screening; it is part of their overall prenatal care management. You would and should recheck her liver test to make sure that she doesn't have significant liver disease or active disease, and you would, perhaps, check her hepatitis B status and check her viral level. Then you can determine whether she needs treatment at this time or whether she can defer therapy, and you can consider the options about treating or thinking about treating in pregnancy to prevent mother-to-child transmission.

MR. BUSKER: Immediate treatment, deferred treatment, treatment to prevent mother-to-child transmission. What key factors do you base your assessment on?

DR. TRAN: In assessing her status I think there are two issues that you have to separate in a woman who is hepatitis B-positive and pregnant. One is whether she needs treatment for her own maternal health, does she have advanced disease, does she have cirrhosis or any indication that it would be high risk for her to have any sort of a flare or increased activity during her pregnancy.

This young woman had relatively normal liver tests, and on repeat has normal liver tests again. She doesn't have any evidence of significant disease or cirrhosis. You would not be inclined to treat her for her own maternal health.

The second issue in a woman with hepatitis B who is pregnant is to decide whether you want to discuss the issues of mother-to-child transmission of hepatitis B. We know that hepatitis B is transmitted from mom to child, and perinatal transmission is one of the most common modes of transmission worldwide. We have recognized higher risk of transmission of hepatitis B when maternal viremia levels are very high, especially in women who have > 10:8 copies/ml of virus.

In her third trimester, I would recheck her viral levels, and if her viral levels are very high, I would consider

initiating antiviral therapy to reduce the chance of mother-to-child transmission of hepatitis B.

MR. BUSKER: Thank you, Dr. Tran. Let's move on to another patient now, please.

DR. TRAN: How about a 30-year-old Korean woman referred when her hepatitis B screening test is positive at her OB's office, again in the first trimester. By the time she gets to you, however, she's 18 weeks' pregnant in the second trimester. She has never been on hepatitis B therapy but has known about her hepatitis B diagnosis for the past five years. She is chronically hepatitis B-infected and discovered to be again positive during her pregnancy.

She has a medical history known of hepatitis B and currently takes no medications except for prenatal vitamins. Her family history is unknown because she is adopted.

On physical exam, she is pregnant but otherwise has an unremarkable physical exam. You repeat her initial labs and she has surface antigen positivity, so she is chronically infected. She is E antigen-negative and E antibody-positive, signifying either that she has less active disease and she seroconverted, or perhaps she may be E antigen negative but with chronic hepatitis B.

Her ALT is normalish at 22 and her bilirubin is 1.0 with a platelet count of 255, and her INR is normal, signifying normal liver function.

You get a hepatitis B viral level and its 10:5 IU/mL, so she has active viremia, but she is E antigen-negative. So this is a woman who probably has E antigen-negative chronic hepatitis B, and she's pregnant and in her second trimester.

MR. BUSKER: In this patient, what risk factors for transmission would you be most concerned about?

DR. TRAN: You're thinking this is a young woman in whom you are trying to prevent transmission of hepatitis B from her to her baby. You want to prevent these things passing on to the next generation, so we're trying to assess what are her risk factors for transmission.

We know that transmission of hepatitis B in general can be via two main routes. Transmission is less than 10% in utero, but perinatal transmission is one very common transmission mode worldwide.

We also see horizontal transmission in some countries of either child to child at an early age with bodily fluids, or adult to adult via sexual transmission or injection drug use.

So the two main routes of transmission of the hepatitis B virus, in general, are perinatal and horizontal transmission. In this case we'd be concerned about perinatal transmission from mom to baby.

The main foundation of prevention of mother-to-child transmission perinatally is by administering the hepatitis B vaccine and hepatitis B immune globulin. If the baby gets hepatitis B vaccine and immune globulin within 12 hours of birth, the chance of this baby having hepatitis B is less than 5%.

E antigen status has been shown to be a factor in perinatal transmission, so mothers who are E antigen-positive have a higher risk of transmission than those who are E antigen-negative, generally because I would think that E antigen-positive mothers are replicating at much higher levels than E antigen-negative patients who are infected, in general.

More recently a lot of data has emerged about high maternal viremia or high virus levels shown to be an important factor. And if we look at papers from Wiseman, et al,1 published in 2009, we can see that if the mother has greater than 10:8 copies/mL or approximately 10:7 IU/mL of virus, the chance of transmission even with appropriate vaccination could be 8.5% in that study. So an important consideration in any pregnant woman who has hepatitis B is her risk factors E antigen-positive versus E antigen-negative. Certainly now we recommend that you consider checking the HBV DNA level to determine that risk as well.

MR. BUSKER: A quick reminder to our listeners: the study by Wiseman, et al that Dr. Tran referred to was discussed in the Newsletter issue, and a link to that study's abstract can be found in the transcript version of this podcast.

Dr. Tran, has it been your experience that expectant mothers have any safety concerns about these vaccines going into their newborns?

DR. TRAN: In my experience the vaccination has been proved safe and effective over more than 20 years of experience with the vaccine, so I don't think mothers who have hepatitis B are that concerned about the vaccination. I think, given that they have chronic disease themselves, more often they just want to everything they can to prevent their child from becoming infected.

I also want to note that it's important to have a multidisciplinary team approach to this. You have a mother who is being followed by the OB, after her pregnancy she may or may not be followed by her OB, so she should have communication with her primary care doctor about following her chronic hepatitis B, and certainly working with a gastroenterologist or hepatologist about managing her chronic hepatitis B. Certainly the child must be followed by the pediatrician for follow-up testing for hepatitis B, probably around the one-year mark to make sure there was no chronic hepatitis B in that baby. So it does take a team to really manage this complex issue.

MR. BUSKER: And we'll return in a moment with Dr. Tram T. Tran from Ceders-Sinai medical Center.

DR. MARK SULKOWSKI: Hello. I'm Mark Sulkowski, Associate Professor of Medicine, Medical Director, Viral Hepatitis Center, Divisions of Infectious Diseases and Gastroenterology/Hepatology at Johns Hopkins University. I'm one of the Program Directors of *eViralHepatitis Review*.

eViralHepatitis Review is a combination newsletter and podcast program delivered via e-mail to subscribers. Newsletters are published every other month. Each issue reviews the current literature in areas of importance to hepatologists, infectious disease specialists, primary care physicians, nurse, nurse practitioners and other clinicians caring for patients with viral hepatitis

Bi-monthly podcasts are also available as downloadable transcripts, providing case-based scenarios to help bring that new clinical information into practice in the exam room and at the bedside.

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MR. BUSKER: Welcome back to this eViralHepatitis Review podcast. I'm Bob Busker, managing editor of the program. Our guest is Dr. Tram T. Tran from the Cedars-Sinai Medical Center in Los Angeles and the David Geffen School of Medicine at UCLA. Our topic is Hepatitis B and Pregnancy.

We've been discussing how the information in Dr. Tran's newsletter issue can be applied in the exam room. Dr. Tran, please present another patient.

DR. TRAN: Let's talk about a 30-year-old Vietnamese female who's been on hepatitis B therapy for the past two years and now wants to become pregnant. One of the major issues that come up in treating hepatitis B is when to treat, and these are long-term, chronic medications.

If you embark on treatment in a young woman of childbearing age and she subsequently wants to have children, I think you will run into a dilemma of what to do with her treatment at the time that she's planning to have children.

This is exactly the case with this young woman. She's 30 years old, has been on therapy for the past two years, presumably because she had active disease, and now she wants to get pregnant. Her medical history is significant only for the hepatitis B. Her mother died of liver cancer at age 56, so her positive family history for liver cancer was probably in consideration when the clinician initially decided to put her on therapy, and she is at increased risk because of that.

She was placed on tenofovir 300 mg PO QD. The two first-line oral medications for hepatitis B treatment are entecavir and tenofovir; she was put on tenofovir 300 mg once daily. She's tolerated it without any problems, and she has one child who is four years old who is fortunately hepatitis B-negative.

Her physical exam is unremarkable, as you would expect in these young, healthy women. She is determined to be still surface antigen-positive. So even though she's been on therapy for two years,

surface antigen seroconversion with therapy or surface antigen loss in seroconversion with antiviral therapy is not very common. So it is not unusual that she remains chronically infected, with surface antigen positivity.

Her ALT is 18, so she has normal liver tests, and she is E antigen-positive and has had active replication.

Her hepatitis B DNA on therapy is undetectable, so her current first-line therapies with either tenofovir or entecavir are highly effective at suppressing virus and at two years will be undetectable in the vast majority of most patients.

MR. BUSKER: As you said, this woman wants to get pregnant again. Would you stop her medication now? Would you continue it? Would you stop it at a later point? What's your best recommendation on that?

DR. TRAN: I think it's a really tough decision. You really have to look at the overall status. She's been on her medication for two years, she's stable, she is virally suppressed, would you continue the medication and keep her on it?

I think that's a very personal decision, I don't think there is a right or wrong answer. I think various clinicians may do it differently. I think for me, assessing the risk and benefit of medication exposure in pregnancy is something you really would have to consider in this case. Tenofovir is pregnancy class B; its safety data from the HIV experience can be seen in the antiretroviral pregnancy registry, which is published and available to all clinicians.

That antiretroviral pregnancy registry looks at the safety of exposure to antiretroviral medications including tenofovir in the first, second, and third trimesters. There is also some data there about hepatitis B exposure to tenofovir.

Tenofovir has been shown to be fairly safe in regard to no increased risk of birth defects compared to the general population, but I think this patient is a little concerned about being on medication at all. She doesn't want any exposure if possible, and I think that's the clinical decision you have to make in discussion with a patient.

So she elects to stop the medication because of her concerns about being on any medication during pregnancy, and fortunately she gets pregnant six months later. You repeat a hepatitis B DNA and it is back to where she probably was at her baseline, 10:8 international units per mL. So she has very high viral levels. She is probably surface antigen-positive, E antigen-positive, normal ALT with very high virus. So she is probably an immune tolerant patient.

But we don't know what her baseline ALT was. We can't go back two years to before therapy, so we would just assume that she had some evidence of active disease.

MR. BUSKER: The risk of transmission in this patient? Talk to us about that.

DR. TRAN: The risks of transmission in this woman would probably be pretty high without hepatitis B vaccine, and HBIG, or hepatitis B immune globulin. We know from historical data that if a pregnant woman is hepatitis B, E antigen-positive and she's has high viremia and the baby does not receive vaccinations, then the chance of transmitting the hepatitis B virus is 70 to 90%. And of course many of those babies go on to develop chronic disease.

So luckily, the foundation of prevention is still the hepatitis B vaccine plus HBIG. But in this patient we can also consider newer data that looks at E antigen positivity as well as viral levels. The large Australian study by Wiseman, where 213 mothers who had detectable hepatitis B virus and all the infants received appropriate immunoprophylaxis with vaccination and were subsequently tested for hepatitis B at 9 months of age.

They stratified risk factors, and in all the infants, the overall transmission rate with vaccination was 2.9%. That seems a relatively reasonable number overall, but when you look at E antigen positivity, the rate goes up to 6.8%, and when you stratify maternal hepatitis B viral levels, mothers who had virus levels greater than 108 copies/mL, the transmission rate was 8.5%.

So this kind of data makes everyone think, well, 2% might be okay, but as we start to approach 8% to 10%, what can we do to decrease that risk? Again, more recently, Han et al,2 a group from China collaborating with some US investigators, looked at maternal/infant transmission status in China in a large group that either received telbivudine, which is one of the hepatitis B medications that are also pregnancy class B, or untreated, so mothers didn't

receive any antiviral therapy. Ninety-five infants received telbivudine and 92 infants received nothing but the appropriate vaccination.

At the 28-week follow-up, the overall transmission rate was 13% in infants who received just vaccination and whose didn't receive any antiviral therapy in the third trimester. In infants whose mothers received antiviral therapy, the transmission rate was 2%. So again, more data are accumulating that the risk of transmission is definitely associated with high viremia and the consideration for antiviral therapy may reduce that risk even in infants who receive the appropriate vaccination.

So stratification of the risk if very important, and the emerging data about antiviral therapy to reduce this risk is important to discuss.

MR. BUSKER: Again I want to note to our listeners that the Wiseman[1] and Han[2] studies that Dr. Tran referred to were reviewed in her newsletter issue, and also that links to those studies can be found in the transcript version of this podcast.

Let's continue with this same patient, Dr. Tran. She's pregnant, she's off therapy — what happened next?

DR. TRAN: After discussing the risks of mother-to-child transmission with this patient, she elects to go back on therapy in the third trimester. She has a history of a mother who has liver disease and manifestations of the hepatitis B. She was infected, so all that concern leads her to want to go back on therapy in the third trimester to reduce the chance of mother-to-child transmission.

I think the important issue you have to discuss with her is the data on safety of therapy in the third trimester to reduce hepatitis B transmission risk, and what is that safety data and what do we really know.

I think our experiences based on the HIV experience, we have two medications that have very robust HIV data, one is lamivudine. Lamivudine is pregnancy class C for hepatitis B, but it does have the most human exposure in the antiretroviral pregnancy registry, which is available online.

When you look at 3TC or lamivudine in HIV, as well as in hepatitis B, the birth defect rate ranges from 2.5% to 2.9%, and these numbers change a little every time they gather more experience reported by clinicians.

This is a self-reported registry, where clinicians who are managing patients report birth defect rates, and the rate of 2.5% to 2.9% for lamivudine is not terribly different from what is reported in the background rate of birth defect rates in general.

When we look at tenofovir, which is pregnancy class B, we see birth defect rates of 1.7% in the second and third trimester to 2.4% in the first trimester, again not probably terribly different from the background rate of birth defects in the general population who are not hepatitis B- or HIV- infected.

The safety data are somewhat limited because these are self-reported registries, but even with the limitations that go with that, these medications appear to be safe in pregnancy. But again, that requires an extensive discussion with your patient in terms of the risks and benefits of treatment.

MR. BUSKER: What do the data show about efficacy of therapy in the third trimester to reduce HBV transmission risk?

DR. TRAN: She has decided to go back on antiviral medication in the third trimester. You've discussed with her the antiretroviral pregnancy registry. Now you want to discuss with her what the benefit of going on medication is, how do we know that it will reduce the risk?

It all started, I think, with a couple of small studies that used lamivudine. One was a randomized, controlled trial in China by Xu et al3 and published in The Journal of Viral Hepatology in 2009, where they randomized 114 to surface antigen-positive women who had high viral levels to lamivudine versus placebo.

All the infants received appropriate vaccine plus HBIG. In the lamivudine versus the placebo group there was a statistically significant difference in surface antigen positivity in the infants at week 52.

There were some concerns about lack of follow-up in some of these patients in the intention-to-treat analysis, but it gave us the proof of concept that antiviral therapy probably did reduce the risk of perinatal transmission in infants who failed

vaccinations because of the mothers' high maternal viremia.

I would touch back again on the Han study, which was done more recently. It wasn't a randomized control trial, but it had two cohorts, one receiving treatment with telbivudine and one receiving nothing. Again, telbivudine reduced the risk of transmission from approximately 13% to 2% in those who received the antiviral therapy.

I think that is the limited data we do have on therapy in the third trimester to reduce the transmission risk. I think that's the kind of stuff you can tell the mother and then she can make the decision based on that kind of data.

MR. BUSKER: And again, just to let our listeners know, that study by Xu[3] was reviewed in Dr. Tran's Newsletter issue, and a link can be found in the transcript version of this podcast.

Back to this patient, Dr. Tran. Cesarean or vaginal delivery — which is considered safer regarding transmission risk?

DR. TRAN: She goes on therapy and her hepatitis B DNA decreases significantly to 10:3 IU/mL, and as she's approaching her due date at 39-1/2 weeks, she wants to discuss with you whether C section or vaginal delivery is safer and is there any new data about that.

There has been no strong data suggesting that the mode of delivery of the baby in a mother who has hepatitis B positivity changes the risk of transmission. There doesn't appear to be a significantly decreased risk with C section versus vaginal delivery.

She would be delivered with whatever mode of delivery is recommended or clinically indicated at the time of birth. I think that that's what you would tell the mother in regard to C section versus vaginal delivery. This is also a very common question that the OBs may have as well, if they have a patient who is hepatitis B positive, should they deliver by C section, and the answer at this point based on the data that we have is no, they should do what's clinically indicated; vaginal delivery should be fine.

MR. BUSKER: The HBV transmission risks of breast feeding — Dr. Tran, talk to us about those.

DR. TRAN: Hepatitis B risks with transmission through breast feeding are also a very common clinical question for all the mothers. As recommended, pediatricians recommend breast feeding for the baby's health and immune benefit. And at this point studies of breast-feeding versus bottle feeding indicate there doesn't seem to be any increased risk of transmission of hepatitis B in mothers who breast feed.

If there is no bleeding or cracked nipples during breast feeding, the recommendation is to allow women who are hepatitis B positive to breast-feed. I think the important question at this point is the medication. She was put on the medication in the third trimester to bring down the transmission risk of the hepatitis B. Once the baby is born and receives the appropriate hepatitis B vaccine plus HBIG, is there really any benefit to continuing the mother's medication? But the answer to that again is clinically unknown, so I think it is up to the clinician to decide whether at that point you've already done everything you can do to prevent transmission to the baby, you've reduced viral levels in the third trimester of the mom while the baby was in utero. Once the baby was delivered, the infant received HBIG plus vaccination, and now you can make the decision whether you want to discontinue the medication.

Breast-feeding, again, is safe and should be allowed, especially if there is no bleeding or any cracks in the skin.

I think another issue that you have to think about is the immune changes that are associated with pregnancy. There have been reports of increased flares during and after pregnancy, so it's something that the clinician, in a multidisciplinary way, should follow with the primary care doctor, the gastroenterologist and the OB in the follow-up of the mother to make sure that she doesn't have a flare after pregnancy, because that has been reported.

MR. BUSKER: Thank you, Dr. Tran, for those three interesting cases. I'd like to shift gears now and ask you to focus on the future for us. What changes might we expect in the area of hepatitis B and pregnancy?

DR. TRAN: I think for hepatitis B, we would like to approach the disease state in a way that we could actually try to cure this virus, so we could really

prevent disease by curing the virus. We have an excellent vaccine to prevent transmission, but really we haven't been that successful in curing the virus in someone who is already infected.

But in terms of hepatitis B in pregnancy, I think where we might be going in the future is further stratification of risk, looking for other biomarkers or other ways we can test for risk of perinatal transmission. We also might be stratifying a little better the hepatitis B DNA level. We know from some studies that it's > 10:8 copies/mL, but there is now emerging data about lower levels, maybe 10:7 or 10:6, and I think we'll see more data coming out of Asia about those kinds of numbers.

Certainly in terms of hepatitis B in general, the availability of the vaccine worldwide is a key issue. Because of the immigrant population in the United States, as well as the worldwide population, the availability of the vaccine and getting that birth dose to countries where they're at high risk, is really where we would like to see the future of hepatitis B. Because in countries that implement that birth dose vaccine, we've reduced the risk of hepatitis B and reduced liver cancer in children; that's been well reported. But I think in countries that are still not able to get that vaccine to the babies at birth, that's where we're really going to be able to make an impact in hepatitis B transmission for the future.

MR. BUSKER: Thank you, Dr. Tran. To wrap up, I'd like to ask you to summarize for us what we've talked about today. Let's begin with the current screening recommendations for hepatitis B.

DR. TRAN: The current screening recommendations for hepatitis B are the 2008 CDC recommendations, which I think are the most widely and broadly applicable. In regard to hepatitis B in pregnancy, the current screening recommendations are that all pregnant women be screened for hepatitis B in the first trimester, and certainly then, if they are positive, the baby should receive appropriate immunoprophylaxis.

Other screening modalities, in general, for the general population, are otherwise available in the 2008 CDC recommendations.

MR. BUSKER: Best strategies to reduce mother to child transmission of hepatitis B?

DR. TRAN: I think, again, the best strategy to reduce a mother to child transmission of hepatitis B is number one, get the hepatitis B vaccine and the hepatitis B immune globulin to the baby within 12 hours of birth to babies who are born to mothers who are hepatitis B positive.

The other strategy to reduce mother-to-child transmission is to vaccinate every baby who is born in any country. If you vaccinate in every baby for hepatitis B, then of course we'll see reduction in transmission overall in the general population.

So treatment in the third trimester to reduce viral levels in the mother, to reduce that chance of mother to child transmission is also an emerging strategy

MR. BUSKER: And finally, the recommendations for breast feeding and vaccination in hepatitis B infected mothers.

DR. TRAN: It is currently recommended that mothers who are hepatitis B-positive be allowed to breast-feed, as there are no data to show increased risk of transmission with breast feeding if the skin is intact and there is no bleeding or other broken skin.

Vaccination in hepatitis B is, again, based on vaccinating the infant with HBIG plus hepatitis B vaccine, and in mothers who are screened hepatitis B negative, you can vaccinate the mother, and that appears to be safe, as well.

MR. BUSKER: Dr. Tram Tran from the Cedars-Sinai Medical Center and the David Geffen School of Medicine at UCLA, thank you for participating in this eViral Hepatitis Review Podcast.

DR. TRAN: Thank you very much for having me; it's been my pleasure.

MR. BUSKER: This podcast is presented in conjunction with the eViralHepatitis Review Newsletter, a peer-reviewed, CME/CE-accredited literature review e-mailed monthly to clinicians treating patients with viral heptatitis.

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Thank you for listening.

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