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### Advanced Management of Preterm Labor: Case Illustrations

Narrator:

Welcome to Grand Rounds Nation on ReachMD. This CME activity, titled "Advanced Management of Preterm Labor: With Case Illustrations" is provided by Omnia Education and supported by an educational grant from Hologic, Inc.

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Your faculty for this presentation is Dr. Martin R. Chavez.

Dr. Chavez:

Hi, my name is Dr. Martin Chavez, and today we are going to be discussing advanced management of preterm labor with case illustrations at the end of the presentation.

The March of Dimes gave a report card to all 50 states when it comes to preterm labor. Unfortunately, when we looked at the country overall, the grade for the United States averaged C. More alarmingly was that for the first time in the last eight years there was an increase in preterm births.

U.S. preterm birth rate went up from 9.57 to 9.63 in 2015. While this seems like a very small amount, when you look at the overall number of births in the United States, which is approximately 4 million births a year, this can add up very quickly. In addition to that, there were some groups where preterm birth rates were nearly 48% higher; this group were in African-Americans. Preterm births less than 37 weeks is the leading cause of deaths of babies in the United States. It also accounts for more than 26 billion annually in avoidable medical and social costs.

One of the diagnostic dilemmas when it comes to trying to determine which patients are at risk is that 30% of preterm labor spontaneously resolve and 50% of the patients hospitalized for preterm labor actually give birth at term. So, when we are trying to figure out which patients are going to be at greater risk we need to try to figure out which patients actually need more resources as opposed to patients we could possibly send home and manage as an outpatient.

I want to take a moment here to make a very important distinction between spontaneous preterm births, which is the ones that we are targeting versus indicated preterm birth. Indicated preterm births fall into the category of needing to be delivered early secondary to either maternal or fetal or both as an indication. And there is a variety of reasons for those including preeclampsia, fetal anomalies, or other predisposing reasons that the patient is better off delivering early. We are talking about spontaneously going into preterm labor and delivery.

When we look at patient history and other risk factors, we should make special note that when you do have a history of a preterm birth, you have a 1.5 to 2.0-fold increase which is substantial. Not only do the number of preterm births make a difference, but also the gestational age. Obviously having a preterm birth at 36 is very different than having a preterm birth at 26 weeks. We also take into consideration preterm births followed by a term, preterm twins followed by a singleton and when the patient delivered.

This is where cervical ultrasonography can be of use. If you just use an absolute cutoff of 25 mm, between 24 and 28 weeks, it's a good start but not perfect.

We also want to take into consideration demographics. As mentioned previously, there are some groups of patients such as African-Americans which have a substantially increased risk of having a preterm birth. There are some things that we do have some control over. Smoking is very important as well as periodontal disease. We do have some control over this and some of the chronic diseases are also something that we could hopefully improve upon before the patient gets pregnant or try to make sure we minimize some of the comorbidities of these chronic diseases during the pregnancy.

There are some things that we don't have any control over such as cervical surgery history or cervical injury from a prior delivery. Things we do want to make sure we keep an eye on during the pregnancy such as vaginal bleeding, UTIs or other types of genital tract infections, are important to monitor and also treat when necessary.

Fetal fibronectin is basically a biological glue between the membranes and the uterine lining which allows that interface to be intact. Interestingly enough, there are two peaks where the fetal fibronectin actually is released in normal fashion very early on in pregnancy prior to 22 weeks and also after 35 weeks.

Some basics about the collection. We want to make sure that we collect prior to any digital exam or manipulation of the cervix to avoid sample contamination. This also includes making sure that the patient has not had intercourse 24 hours prior. During the speculum exam you want to lightly rotate in the posterior fornix, and if you look on the right hand side there is a blown up image of step two to emphasize this. It makes sense because if you look where the secretions would naturally fall, they would fall in the posterior fornix from the endocervical canal and that's where you are going to get the most accurate results. Step three and four is to make sure that the swab is securely and appropriately placed in the transport test tube to safely arrive at the lab to give you the most accurate results.

Just to review, and we want to review these because they are important, is that we do not want to contaminate the swab with any lubricants. So, a digital exam or transvaginal ultrasound which do utilize lubricant, the sexual intercourse 24 hours prior, as well as not to use if there is any moderate or growth blood present. I can tell you from our clinical practice, that if there is a small amount of blood there we take into consideration that if the test does come back positive, it could be as a result of this as opposed if it comes back negative we are reassured that it truly is negative.

Other common sense things to keep in mind but are still important, is that you don't want cervical dilatation past 3 cm, because then you are not going to get accurate results and we do not want to utilize this test if there is premature rupture of the membranes or if there is a placenta previa or an eruption, because you would get false information from the blood as well as since the placenta previa would be blocking any secretions from allowing to come out through the endocervical canal, as well as perhaps, some bleeding.

Let's review utilization of ultrasonography. This is from the prediction and prevention of preterm labor from the Practice Bulletin #130 from October 2012. It is an algorithm for the management of short cervical length in the second trimester. Now, the first thing you want to see at the first level, is that unfortunately, in multiple gestations we have no clearcut answer as to how best to approach these patients, and there is really no intervention has been shown to improve outcomes. When you look at the singleton gestations, when there is no prior spontaneous preterm birth, one can consider vaginal progesterone if the cervical length is less than 20 mm or less before or at 24 weeks of gestation. If there has been a prior spontaneous preterm birth and the patient is already receiving progesterone supplementation since 16 weeks, which is the recommended start time, cerclage should be considered if the cervix is less than 2.5, given their history, before 24 weeks and prior preterm birth occurred at less than 34 weeks of gestation. It is also important to try to standardize the measurement of cervical length utilized in ultrasonography.

This is from Berghella et al, and it is a nice template to use in your ultrasound room or unit to try to make sure you have accurate measurements. You want to make sure that anterior and posterior portion of the cervix are equal, you are not pressing too hard with the vaginal probe, and you want to make sure that you measure on the exterior portion of the endocervical canal to the interior portion of the cervical canal and also identifying any funneling, because while you can measure the entire cervix if there is a funnel, you want to measure the functional cervical length which is actually, what's actually taken into the consideration for the management of short cervixes.

There was a nice review in Obstetrics and Gynecology in 2008, with the utilization of fetal fibronectin in the prediction and prevention of spontaneous preterm births. Dr. Kiefer and his colleagues were able to demonstrate nicely that you could utilize cervical length with fetal fibronectin to predict which patients were at higher risk.

They used a cutoff of 15 mm plus or minus fetal fibronectin and they realized when it was less than 15 mm and the fetal fibronectin was positive, the likelihood of admission to delivery interval was higher as opposed to a cervical length which was greater than 1.5 cm or 15 mm and a negative fetal fibronectin. If you focus on the management algorithm on the right hand side, you realize that you want to take into consideration prior history of spontaneous preterm birth or second trimester loss or other high risk factors such as smoking, and if you look at the baseline cervical lengths, starting at 16 to 20 weeks, less than 1.5 cm, or between 1.5 to 2, or between 2.1 to 2.5, or greater than 2.5, you realize that the patients that have less than 1.5 and positive fetal fibronectin, are at higher risk and should have

increased surveillance, decreased activity and this surveillance could be increasing the cervical length surveillance as well as consideration of a cerclage if less than 1.5 cm or there is progressive shortening. If greater than 24 weeks, consideration of tocolytics therapy if there are uterine contractions every 4 hours or more, or betamethasone as well. When the cervical length was greater than 2.1 cm, you can see that there might have been some decrease in physical activity, but for the most part, you would just have visits approximately every week to make sure that there wasn't progressive shortening, and if there was, then you would consider, depending on the gestational age, either intervention or consideration of a cerclage, or if greater than 24 weeks, tocolytics or administration of betamethasone if it hadn't been given already.

While we are not going to go into much detail, it is important to realize that if a patient screens on the high risk with a short cervix and a positive fetal fibronectin, one can consider antenatal steroids to decrease complications from prematurity and lung issues; in addition to that, treating any underlying infections as well as tocolytics. If the patient does have a history of a preterm birth, hopefully they had already been started on progesterone supplementation, and for patients who already have a delivery or loss, possibly even a cerclage, if it is before 24 weeks. While there is some controversy about bedrest and decreased activity, there is some benefit depending on the patient and their lifestyle to consider this additional management option.

Other risk factors when you are counseling patients are smoking, diet and dental hygiene. You want to make sure that you customize the risk profile for the patient. If a patient has never had a preterm delivery and have had full term deliveries, obviously, that would weigh in the direction of less concern versus the patient who has had a history of preterm deliveries. The challenges are a little bit more when you have a prime and you don't have any referencing prior pregnancies, but you want to utilize tools like fetal fibronectin to help determine if the risk is lower in that one-week timeframe or actually higher, and fetal fibronectin plus cervical length will help you stratify these patients to know if you need to follow more closely versus more conservative surveillance. You want to educate patients in symptoms, and take into account that information that you can gather, with cervical length by ultrasonography, as well as information of the fetal fibronectin and gestational age is also important.

We also want to educate the patient about what the signs and symptoms of preterm labor are. Some patients might not realize that they are having contractions or a change in their vaginal discharge that they might consider as "normal" for pregnancy, but might be the early signs or symptoms of preterm labor. Simple counseling tips as constant, low dull backache, or belly cramps, or regular frequent contraction is important to review with the patients as well as leaking of water to make sure that the patient has not had a preterm birth event.

Let's start with our clinical examples. We have two for today's lecture. The first one is a 24 weeker (sic), gravida 1, para 0, and on routine surveillance her cervical length is measuring 2.6 cm. She is having contractions on the monitor, no change on digital exam. The fetal fibronectin swab was obtained prior to an ultrasound or digital exam and placed on the side, which is something that we routinely do in our practice and we also recommend. This allows you the ability that if you feel that the rest of the exam, other information that you've gotten for the pregnancy, indicates that this patient is at extremely low risk that sending the fetal fibronectin might not add additional information. But if you wait until after you have done a digital exam or cervical length ultrasonography, you won't have the ability to get the fetal fibronectin at that visit and you might have to wait 24 plus hours. In this particular case, the fetal fibronectin was placed on the side and was sent and it came back negative. This allowed us to reassure the patient, review with them any further signs of preterm labor and allow the patient to be managed as an outpatient. This not only reduced the anxiety for the patient, reduced the costs and, in all likelihood, this patient will do well and be able to be managed conservatively in an outpatient setting.

The next patient is a 27 week, gravida 2, para 0. This patient did have a pregnancy loss and her cervical length was measuring 1.4 cm with contractions on the monitor, no change on digital exam, just like the prior pregnancy, the fetal fibronectin was obtained prior to the ultrasound or digital exam, and placed to the side, and was sent and it did come back positive. Now, this patient would be a candidate for consideration for tocolytics as well as steroids for fetal lung maturity, and monitoring the patient to make sure that they did receive their course of fetal steroids for lung maturity, as well as to consider increased surveillance to see if the cervix would have gotten shorter, or if they had had continuous contractions on the monitor, or change on the digital exam.

While these are two very different scenarios it emphasizes the importance of utilizing fetal fibronectin as part of your toolkit to help stratify which patients you can monitor more conservatively, or as an outpatient versus patients that might need more surveillance or consideration to inpatient.

I'd like to finish up by summarizing these three important points: While we have made improvements in prenatal care, we have not made much progress in the rate of preterm delivery, and in fact, we have actually gone up from the study of the March of Dimes. So, we really need to try our best utilizing tools that we currently have to try to maintain the ground that we had made up in the past when it came to preterm delivery. We also want to emphasize that ultrasonography is an important aspect, particularly when combined with fetal fibronectin, and can be a powerful tool to help determining a higher risk of preterm delivery. It allows us to utilize the resources for the

patients that truly need them.

And the last point is, the importance of patient education for not only the signs and symptoms, but also for influencing risk factors that can be reduced, whether it is reduction or elimination of smoking, dental hygiene and also making sure patients are aware of what to look out for.

I hope that this review has been helpful and you can implement it in your practice. This is something that we need to make better strides on, and I think that if we utilize all the tools available to us we can make a difference.

Once again, thank you very much for your attention. This is Dr. Martin Chavez for Omnia Education.

Narrator:

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