OBSTETRICS

The latest on labor patterns, the risk of major infection during pregnancy, and prenatal screening tests

›› Jaimey M. Pauli, MD
Dr. Pauli is Assistant Professor, Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology, Penn State University College of Medicine, and Attending Perinatologist at the Milton S. Hershey Medical Center in Hershey, Pennsylvania.

›› John T. Repke, MD
Dr. Repke is University Professor and Chairman of Obstetrics and Gynecology at Penn State University College of Medicine. He is also Obstetrician-Gynecologist-in-Chief at the Milton S. Hershey Medical Center in Hershey, Pennsylvania. Dr. Repke serves on the OBG MANAGEMENT Board of Editors.

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Over the past year, much attention has been devoted to labor curves. Is the original Friedman labor curve, which dates to the 1950s, still applicable today? Or do contemporary women labor differently? And if we update our approach to labor management, can we reduce the rate of primary cesarean?

In this Update, we explore these questions, as well as two others:

- How do we minimize infectious morbidity in pregnancy?
- How much prenatal screening is too much?

Is adherence to new labor curves the best way to reduce the rate of primary cesarean?

American College of Obstetricians and Gynecologists. Obstetric Care Consensus No. 1: Safe prevention of the primary cesarean delivery. Obstet Gynecol. 2014;123(3):693–711.

Cohen WR, Friedman EA. Perils of the new labor management guidelines [published online ahead of print September 16, 2014]. Am J Obstet Gynecol. doi:10.1016/j.ajog.2014.09.008.

In 2012, the cesarean delivery rate in the United States remained at 32.8%, a high percentage when one considers the increased risks that major abdominal surgery poses in both the short and long term (blood loss, transfusion, infection, venous thromboembolism, abnormal placentation, hysterectomy).[1] The American College of Obstetricians and Gynecologists (ACOG) and the Society for Maternal-Fetal Medicine (SMFM) have made

it a priority to reduce the cesarean delivery rate, focusing their efforts on the primary cesarean. In March 2014, they jointly issued guidelines on the "Safe prevention of the primary cesarean delivery," highlighting labor dystocia as a top cause.

When contemporary data from the Consortium on Safe Labor were applied to the original Friedman labor curve, investigators found that the active phase of labor may be slower than previously thought.[2] The maximum slope for the rate of cervical change was not observed until 6 cm of dilation. This finding potentially changes the point at which arrest of the active phase may be declared. The maximum duration of augmentation with oxytocin also has been extended, based on studies that demonstrated increased vaginal delivery rates.

The Consortium on Safe Labor proposed that, by subjecting a contemporary population to decades-old standards, we have been intervening with primary cesarean too early in the treatment of labor dystocia.

FAST TRACK

Use clinical judgment in conjunction with any new guidelines when deciding when to intervene with primary cesarean

What the guidelines say

The new recommendations from ACOG-SMFM suggest that arrest of the active phase of labor can be declared only when the patient is dilated at least 6 cm with ruptured membranes after either 4 hours of adequate uterine contractions or at least 6 hours of oxytocin administration with inadequate uterine contractions or no cervical change.

Although the recommendations state that there is no maximum duration of the second stage of labor, we may increase the vaginal delivery rate by increasing the duration of pushing to 2 hours for a multiparous patient and 3 hours for a nulliparous patient (with an additional hour when an epidural is given).

WHAT THIS EVIDENCE MEANS FOR PRACTICE

Proceed with caution when applying labor curves to patients. Use clinical judgment in conjunction with any new guidelines.

Are the recommendations ready for prime time?

In response to the recommendations, Cohen and Friedman (author of the original labor curve) published "Perils of the new labor management guidelines," cited above. In this commentary, they caution against universal acceptance of the guidelines without further validation. They argue that the analytical method used—and not labor itself—has changed, with possible selection biases and unadjusted confounders altering the shape of the dilatation curve. Cohen and Friedman suggest that serial evaluation of the patient is preferable to an arbitrary cutoff of 6 cm.

They also criticize other aspects of the guidelines, focusing on universal use of intrauterine pressure catheters, amniotomy, and a specific duration of pushing without consideration of descent. A "one size fits all" approach may incur risk to both the mother and the fetus without proven benefit, they contend. Clinical judgment and continuous evaluation of the likelihood and safety of vaginal delivery also are encouraged rather than a reliance on labor curves in isolation.

They urge further validation before adoption of the recommendations. "If we direct our clinical and basic science investigations to the goal of practicing obstetrics in a manner that optimizes maternal and newborn outcomes, the ideal cesarean delivery rate, whatever it may be, will follow," they write.

COMING IN FEBRUARY Update on Fertility
G. David Adamson, MD, and Mary E. Abusief, MD

Be vigilant for infectious threats to your obstetric population

Jamieson DJ, Uyeki TM, Callaghan WM, Meaney-Delman D, Rasmussen SA. What obstetrician-gynecologists should know about Ebola: a perspective from the Centers for Disease Control and Prevention. Obstet Gynecol. 2014;124(5):1005–1010.

American College of Obstetricians and Gynecologists. Committee Opinion No. 614: Management of pregnant women with presumptive exposure to Listeria monocytogenes. Obstet Gynecol. 2014;124(6):1241–1244.

American College of Obstetricians and Gynecologists. Committee Opinion No. 608: Influenza vaccination during pregnancy. Obstet Gynecol. 2014;124(3):648–651.

We no longer consider pregnancy an immunosuppressed state but, rather, a more immune-modulated system. However, there is no question that the unique physiologic state of pregnancy places a woman and her fetus at increased risk for infection. This was devastatingly obvious during the H1N1 epidemic of 2009 and was reemphasized during a 2014 outbreak of *Listeria monocytogenes*. We are reminded again during the largest Ebola virus outbreak in history in West Africa, where women have been disproportionately affected.

No neonates have survived Ebola

Although Ebola infections in the United States have been very few, vigilance for people at risk of infection and preparedness to act in the case of infection are vitally important.

The Ebola virus is thought to be spread to humans through contact with infected fruit bats or primates. Human-to-human transmission occurs through direct contact with blood or body fluids (urine, feces, sweat, saliva, breast milk, vomit, semen) of an infected person or contaminated objects (needles, syringes). The incubation period is 2 to 21 days (average, 8–10 days).

Infected people become contagious only upon the appearance of fever and symptoms, which include headache, muscle pain, fatigue, weakness, diarrhea, abdominal pain, vomiting, bleeding, and bruising. The differential diagnosis includes malaria, typhoid, Lassa fever, meningococcal disease, influenza, and Marburg virus.

Treatment of Ebola is supportive care and isolation (standard, contact, and droplet precautions). Prevention is through infection-control precautions and isolation and testing of those exposed, with monitoring for 21 days.

Although pregnant women are not thought to be more susceptible to infection, they are at increased risk of severe illness and mortality, as well as spontaneous abortion and pregnancy-related hemorrhage. No neonates of women infected with Ebola have survived to date.

The CDC recommends that physicians screen patients who have traveled to West Africa and those with fevers and implement appropriate isolation and infection-control precautions. Many hospitals have developed Ebola task forces with this in mind.

Updated information is available at www.cdc.gov/vhf/ebola/index.html.

Pregnant women are highly susceptible to Listeriosis

A nationwide food recall in mid-2014 prompted significant media attention to *L monocytogenes*, particularly its effect on pregnant women, who have an incidence of Listerial infection 13 times higher than the general population. Although maternal illness is relatively mild, ranging from a complete lack of symptoms to febrile diarrhea, there is an increased risk to the fetus or neonate of loss, preterm labor, neonatal sepsis, meningitis, and death. The perinatal mortality rate is 29%.

The mainstay of prevention during pregnancy is improved food safety and handling,

FAST TRACK

CDC: Screen patients who have traveled to West Africa for Ebola, as well as those with fevers, and implement appropriate precautions for those who screen positive

as well as counseling of pregnant women to avoid unpasteurized soft cheeses, raw milk, and unwashed fruits and vegetables, and to avoid or heat thoroughly lunch meats and hot dogs.

When a pregnant woman is exposed to Listeria, management depends on the clinical scenario, as outlined by ACOG:

- **Asymptomatic pregnant women** do not require testing, treatment, or fetal surveillance. Any development of symptoms within 2 months may justify further evaluation, however.
- **Pregnant women with mild gastrointestinal or flulike symptoms but no fever** also can be managed expectantly. Blood cultures may be appropriate; if positive, antibiotic therapy should be initiated.
- **A febrile pregnant woman** should have blood cultures assessed and be started on antibiotics. The preferred regimen is intravenous ampicillin 6 g/day with or without gentamicin for 14 days. If delivery occurs, placental cultures may be assessed. Listeriosis also can be diagnosed by amniocentesis. Stool cultures are not recommended.

Influenza is largely preventable

It is important to remember that one of the most dangerous viruses for pregnant women can be prevented. However, only 38% to 52% of women who should have received the influenza vaccine around the time of pregnancy actually did so between 2009 and 2013, according to the ACOG Committee Opinion cited above. Pregnant and postpartum women are at increased risk of serious illness, prolonged hospitalization, and death from influenza infection.

The vaccine is safe and effective. Not only does it prevent maternal morbidity and mortality, but it reduces neonatal complications. Inactivated vaccine is recommended for all pregnant women at any gestational age during the flu season.

Because many women are hesitant to accept the vaccine, accurate education is essential to dispel misconceptions about it and its components. It has been shown that if an obstetric clinician recommends the vaccine and makes it available, pregnant patients are five to 50 times more likely to receive it. As obstetricians, we are compelled to make this a priority in our practice.

WHAT THIS EVIDENCE MEANS FOR PRACTICE

Be alert and ready to act if an infectious threat is noted in your obstetric population. Get your flu shot. Give it to your obstetric patients. And don't forget that ACOG also supports the administration of one dose of the tetanus, diphtheria, and pertussis vaccine during each pregnancy.

FAST TRACK

Inactivated flu vaccine is recommended for all pregnant women at any gestational age during the flu season

How much prenatal screening is too much?

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The placenta of a normal pregnancy secretes small amounts of a variety of biomarkers such as alpha-fetoprotein (AFP), human chorionic gonadotropin, unconjugated estriol, inhibin A, pregnancy-associated placental protein A (PAPP-A), soluble fms-like tyrosine kinase, and placental growth factor.

The association between abnormal maternal serum biomarkers and abnormal pregnancy outcomes has been known since the 1970s, when elevated AFP was noted in pregnancies with fetal open neural tube defects. Shortly thereafter, low levels of AFP were associated with fetuses with trisomy 21.

One theory is that the abnormality in pregnancy leads to abnormal regulation at the level of the fetal-placental interface and over- or under-secretion of the various biomarkers. An offshoot of this theory is the idea that abnormal placentation (ie, preeclampsia, fetal growth restriction, accreta) also may be reflected in elevated or suppressed secretion of placental biomarkers, which could be used to screen for these conditions during pregnancy.

PAPP-A is a placental serum marker that is a component of first-trimester genetic screening. It is a marker of placental function, and low levels have been associated with fetal growth restriction, preterm birth, preeclampsia, and fetal loss. Another first-trimester marker associated with adverse outcomes is cell-free fetal DNA. This DNA, found in the maternal blood, is a product of placental apoptosis, and elevated levels have been demonstrated in women who develop preeclampsia.

Although many of the biomarkers listed here are not available specifically as a clinical screening test in the United States, the link to common genetic screens makes it tempting to try to add prediction of preeclampsia and other information to an existing test. If specific numbers are reported on the genetic screen for the different markers, that information is already there, and some companies may flag abnormally high or low levels.

However, although the association between abnormal pregnancy outcomes and abnormal biomarkers is well established in the literature, the clinical predictive value is not—nor is there always an effective intervention available. One could argue that low-dose aspirin, which is already recommended for patients with a prior delivery before 34 weeks due to preeclampsia, or more than one prior pregnancy with preeclampsia, could be recommended for patients identified on early screens to be at increased risk for preeclampsia. This approach should be tested in randomized clinical trials before universal adoption.

WHAT THIS EVIDENCE MEANS FOR PRACTICE

Although it is tempting to use associations to predict adverse events, the clinical value of doing so has not yet been proven. Exercise caution before potentially causing concern for both you and your patient.

FAST TRACK

The clinical predictive value of various biomarkers during pregnancy is not yet established. Exercise caution when ordering and reporting these tests.

References

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