Rapid PCR Could Cut Intrapartum Antibiotic Use

BY MIRIAM E. TUCKER
Senior Writer

WASHINGTON — Use of real-time polymerase chain reaction to screen for group B *Streptococcus* in the delivery room could reduce the use of intrapartum antibiotics by more than half, compared with antenatal screening alone, the findings of a single-center study of 232 pregnant women suggest.

Current CDC guidelines call for vaginal and rectal swabs at 35-37 weeks' gestation and for all women with cultures positive for group B *Streptococcus* (GBS) to receive intravenous antibiotic prophylaxis during labor and delivery (MMWR 2002;51[RR11]:1-22). This practice has greatly reduced the rates of neonatal sepsis in the United States, but it is imperfect. Women whose status is unknown at the time of labor also must receive prophylaxis, resulting in overtreatment, while cultures can fail to detect GBS in women who are lightly colonized, resulting in failure to treat.

Rapid testing at the time of delivery using real-time polymerase chain reaction (RT-PCR) has the potential to solve these problems, Dr. Stefan Gerber and his associates said in a poster presentation at the jointly held annual Interscience Conference on Antimicrobial Agents and Chemotherapy and the annual meeting of the Infectious Diseases Society of America.

Of 232 women presenting for vaginal birth at University Center Hospital, Lausanne (Switzerland) in an 8-month span, 19% (44) had positive GBS cultures at 35-37 weeks, 65% (152) had negative cultures, and 16% (36) had unknown GBS status at the time of delivery. Per the guidelines, 34% of the women (80) received prophylactic antibiotics during labor, but treatment was completed (at least two doses or at least 4 hours of intravenous antibiotics) in just 21% (17).

Unlike cultures, which must be performed by technicians, the RT-PCR technology can be used by labor and delivery nurses or obstetricians.

Lower vaginal and rectal swabs were obtained in all the women in the delivery room, and GBS detection was performed by both culture and RT-PCR, using Cepheid's Xpert GBS test, which runs on the GeneXpert System, a fully automated molecular testing system. Results were available in 75 minutes (compared with 2 days for cultures). By RT-PCR, just 15% (35) of the women were GBS positive, suggesting that 19% (45) of the women had received unnecessary prophylaxis, Dr. Gerber and his associates at the hospital reported.

Of the 35 PCR-positive women, 7 had negative cultures—presumably because they were only lightly colonized—and therefore would not have received antibiotics under the antenatal screening guidelines.

All 35 PCR-positive women received prophylaxis but just 7 (22%) completed it.

Since further work-up of the newborn is required when the mother doesn't receive complete antimicrobial prophylaxis, RT-PCR could potentially represent a significant cost saving. An ongoing study is investigating the cost-effectiveness of the approach, Dr. Gerber said in an interview.

Moreover, unlike cultures, which must be performed by technicians, the RT-PCR was performed by the midwives themselves. The technology could also be used by labor and delivery nurses or obstetricians, Dr. Gerber said in an interview.

Dr. Gerber stated that he had no financial ties to Cepheid. The company provided the equipment for the study, but no additional funding.

Most insurance plans cover the Xpert GBS test, which was approved by the Food and Drug Administration in 2006. It is categorized as "moderate complexity" by the FDA, meaning that non–laboratory health care professionals such as physicians and nurses can run the test, a Cepheid spokesman said in an interview.

The spokesman declined to say how many Xpert GBS tests are currently in use, but he did say that as of the last quarter of 2008, there were 848 GeneExpert Systems installed worldwide, capable of running the GBS test. ■

Infant *S. aureus* Colonization Rises After Birth in Cases of Maternal Nasal Carriage

BY KERRI WACHTER
Senior Writer

WASHINGTON — *Staphylococcus aureus* colonization increases significantly in the first 2 months of life and appears to be positively associated with maternal carriage, based on a study of 200 mother-neonate pairs.

At delivery, *S. aureus* detection among 165 infants was 8%; at discharge, detection among 190 infants was 7%. However, at age 2 months, 33% of infants were colonized with *S. aureus*—17% with methicillin-resistant *S. aureus* (MRSA), Dr. Clarence B. (Buddy) Creech II said at the jointly held annual Interscience Conference on Antimicrobial Agents and Chemotherapy and the annual meeting of the Infectious Diseases Society of America.

"In those mothers who had no evidence of nasal colonization at 2 months, the vast majority of their infants also remained uncolonized. However, among those mothers who had methicillin-susceptible *S. aureus* (MSSA) nasal colonization [at 2 months], 51% of their infants were nasally colonized with MSSA." Of mothers with MRSA nasal colonization, 45% of their infants had nasal MRSA colonization at 2 months.

"We were able to detect MRSA carriage in a significant number of mothers and infants; however, we have not observed many infections in this cohort," Dr. Creech said in an interview. The findings demonstrate that staphylococci are commensal organisms and part of normal flora. "The question that remains is whether certain strains of staphylococci, in certain hosts, are more likely to cause disease than others."

Pregnant women were recruited at the time of group B streptococcus (GBS) screening between gestational weeks 35 and 37. At that time, nasal swabs for *S. aureus* and rectovaginal swabs for GBS and *S. aureus* were taken. Nasal swabs were repeated in the mother on the day of delivery and at 2 months post partum. Neonatal nasal and umbilical swabs were obtained within 2 hours of birth and nasal swabs were repeated on the day of discharge and at 2 months.

At the time of the presentation, 431 pregnant women had been enrolled. Dr. Creech, of the pediatric infectious diseases department at Vanderbilt University, Nashville, Tenn., presented data on the first 200 mother-neonate pairs with data out to the 2-month period. Mothers were primarily recruited from academic private practice and an obstetric resident clinic serving an inner-city Medicare population in Nashville.

Nasal *S. aureus* colonization of mothers in pregnancy was 23.5%—12% for MSSA and 11.5% for MRSA. Rectovaginal *S. aureus* colonization of mothers during pregnancy was 17%—13% for MSSA and 4% for MRSA. It was not always possible to obtain neonatal swabs within 2 hours of delivery. In all, 165 infants were evaluable at delivery. Neonatal MSSA detection at delivery (not necessarily colonization) was 5% and MRSA detection was 3%; 190 infants were evaluable at discharge. Neonatal MSSA detection at discharge was 2%; MRSA detection was 5%.

Of the 136 mothers who did not have *S. aureus* colonization during enrollment, 96% of their infants did not have *S. aureus* detected at delivery, 3% of infants had MSSA, and 1% had MRSA. Of the 21 mothers who had MSSA colonization at enrollment, 67% of their infants did not have *S. aureus* detected at delivery, 19% of infants had MSSA, and 14% had MRSA. Of the eight women who had MRSA colonization during enrollment, 62% of their infants did not have *S. aureus* detected at delivery, 13% of infants had MSSA, and 25% had MRSA.

Two babies developed disease during the first 5-7 weeks. One infant had an abscess that required drainage and intravenous antibiotics. The other infant developed purulent conjunctivitis. The isolates from these infections matched very closely the USA300 strain with staphylococcal cassette chromosome mecIV and were Panton-Valentine leukocidin toxin positive.

With regard to women colonized with *S. aureus* during pregnancy, "there [are] no data to suggest that prophylactic antibiotics that cover *S. aureus* would be of any benefit. Many infants in whom MRSA was detected within 2 hours of birth had no evidence of *S. aureus* at discharge or at 2 months follow-up," he said.

Dr. Creech disclosed financial relationships with several pharmaceutical companies. ■

History of Preeclampsia Multiplies CVD Risks

WASHINGTON — Women with a history of preeclampsia or eclampsia had more than twice the risk of developing cardiovascular disease than that of women with uncomplicated pregnancies, based on results of a meta-analysis that included more than 100,000 preeclamptic women.

Results from previous studies have shown associations between preeclampsia and increased risk of stroke and hypertension later in life.

To evaluate the long-term risk for cardiovascular problems in women with preeclampsia or eclampsia (referred to as PET), Dr. Sarah McDonald and her colleagues at McMaster University, Hamilton, Ont., conducted a meta-analysis of 5 case-control studies and 10 cohort studies. The studies included data from 118,990 preeclamptic women and 2.3 million women without PET.

The selected studies examined the development of cardiovascular disease or mortality at more than 6 weeks post partum in women with and without PET. Most (11 of 15) studies focused on women aged younger than 56 years.

The results were presented in a poster at the annual congress of the International Society for the Study of Hypertension in Pregnancy. Overall, there was a graded relationship between the severity of PET and the risk of cardiac disease. Women with severe PET had a fivefold increase in risk compared with women who did not have PET. The risk ratios for cardiac disease for mild, moderate, and severe PET were 2.00, 2.99, and 5.36, respectively.

In a pooled analysis of the case-control studies, women with a history of PET were more than twice as likely to develop cardiac disease (odds ratio 2.47). In a pooled analysis of the cohort studies, women with history of preeclampsia had a significantly increased risk of cardiac disease (relative risk 2.33), cardiovascular mortality (relative risk 2.29), cerebrovascular disease (relative risk 2.03), and peripheral artery disease (relative risk 1.87).

Despite the large numbers of patients in this meta-analysis, more research is needed to determine the mechanisms behind the association between PET and heart disease, and to develop interventions to prevent these complications, the researchers noted.

Dr. McDonald stated that she had no financial conflicts to disclose.

—Heidi Splete