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Revised Perinatal Group B Strep Guidelines

The Centers for Disease Control (CDC) has published revised guidelines for prevention of perinatal group B streptococcal disease (MMWR 2010;59, No. RR-10). Despite an 80% decreased incidence of early-onset group B streptococcal (GBS) infections since prevention guidelines were issued in 1996 and revised in 2002, GBS disease remains the leading infectious cause of morbidity and mortality in U.S. newborns.

Maternal recto-vaginal GBS colonization is the foremost risk factor for early-onset neonatal disease. According to the CDC, pregnant women with GBS colonization are >25 times more likely to have infants with early-onset GBS disease. An estimated 10% to 30% of pregnant women are recto-vaginally colonized with GBS, which can be transient, intermittent, or persistent. Some colonized women will develop GBS infections such as urinary tract infection, amnionitis, endometritis, sepsis, or meningitis. Infected infants most commonly have pneumonia or sepsis, or less frequently, meningitis. GBS can be transmitted through ruptured or intact membranes. Additional risk factors for early-onset infection include gestational age <37 weeks, prolonged rupture of membranes, intra-amniotic infection, young maternal age, black race, previous delivery of a GBS-infected infant, and heavy maternal colonization.

Saint Luke's Regional Laboratories' Microbiology has modified practices to meet revised recommendations that pertain to laboratory testing. With regard to susceptibility testing, erythromycin will not be reported on GBS isolates. Erythromycin is no longer recommended for treatment or prophylaxis of GBS under any circumstance, due to emergence of resistant strains (up to 32% of strains resistant). D-testing for inducible clindamycin resistance will continue to be performed routinely on all tested isolates. Of note, routine susceptibility testing of all GBS is unnecessary, except in penicillin allergic women,

and is performed only by request for that reason. The revised guideline also addresses reporting of urine culture colony counts and states that little data is available regarding GBS disease risk in the presence of low colony-count GBS bacteriuria. However, low GBS colony counts in urine can be associated with vaginal-rectal colonization. Microbiology will continue to report GBS in any amount from urine cultures.

The recommendation for GBS screening of all pregnant women at 35-37 weeks' gestation screening is retained in the revised guideline. The preferred specimen is a recto-vaginal swab. Both GBS culture & NAAT (PCR) testing are performed by SLRL. We have found GBS PCR testing to have superior sensitivity and specificity over culture.

Other revisions to the guidelines include new algorithms for screening & prophylaxis for preterm labor or preterm rupture of membranes, changes in dosing for penicillin, and a revised algorithm for treatment of newborns. These new guidelines have been endorsed by the American College of Obstetricians and Gynecologists (ACOG) and the American Academy of Pediatrics.

Guidelines for Detecting IV Contamination of Blood Samples

Many inpatients have intravenous (IV) catheters. While IV lines provide a means of direct vascular access for infusing fluids, collection of specimens through these lines can result in contamination of the specimen with the contents of the catheter. Last year, the laboratory at Saint Luke's Hospital rejected 387 blood samples that were contaminated with IV fluid.

Whenever possible, specimens should be collected from the arm opposite the IV to avoid contamination. Specimens should not be collected distal to a catheter because fluids tend to pool in the periphery of the limb. They should not be collected proximal to a catheter because the blood sample will be diluted by infusion fluid.

When vascular access is limited, a specimen may need to be collected from a line. This decision should only be made after weighing the risk of specimen contamination versus the risk of phlebotomy from another site. Before drawing a specimen from a line, the infusion fluid should be completely stopped for several minutes and an amount of blood equal to three or more times the deadspace of the catheter should be discarded. Ideally, a specimen should never be drawn from a line that is being used to infuse the same analyte that the laboratory will be measuring because even three volumes of discarded blood may not be an adequate amount to ensure complete flushing of the line. A perfect example is the collection of a specimen for plasma glucose measurement from a line being used to infuse D5W. Although 5% dextrose does not sound like much, it denotes a glucose concentration of 5000 mg/dL. Contamination of the blood specimen with just one part in twenty of this highly concentrated solution can falsely elevate a blood glucose value by as much as 100 mg/dL. Additionally, electrolytes measured on this contaminated specimen will be falsely decreased due to dilution.

The laboratory may not catch every IV contaminated specimen. Below are some parameters that may be helpful in determining if a blood sample has been contaminated with fluid from an IV catheter:

- Na <130 mEq/L and Cl <100 mEq/L and K >5.5 mEq/L
- Glucose >800 mg/dL and creatinine <0.6 mg/dL
- Na >180 mEq/L and K <2.5 mEq/L

(Hernandez, James, Mayo Medical Laboratories, Clinical Laboratory News, April 2011)

These findings may be particularly helpful in interpreting a sudden shift in laboratory results that cannot be explained by a change in clinical condition. If a CBC specimen was submitted at the same time as a chemistry panel, its results should also be reviewed to determine if the hemoglobin or hematocrit is consistent with previous. An unexplained decrease may be due to IV contamination. Another parameter worth examining is MCV which should not fluctuate more than 1-2 fL within an individual. A sudden shift of 4-5 fL, in the absence of a recent transfusion, is another reliable indicator of IV fluid contamination.

Drug levels drawn from IV lines should also be interpreted cautiously. Some drugs, such as cyclosporine, tacrolimus and vancomycin, are very hydrophobic and adhere to tubing. Falsely elevated drug levels can be seen even after discarding 10 or more volumes of blood. Physicians need to carefully review unexpectedly high drug levels collected from patients with IVs.

Elephant-transmitted Tuberculosis

Approximately 500 elephants live in captivity in the U.S. & among these animals, roughly 12% of Asian and 2% of African elephants are believed to be infected with *Mycobacterium tuberculosis*. Elephants can develop cavitory lung lesions due to tuberculosis (TB), or may lack clinical signs of infection. Transmission of infection to other elephants or humans occurs through contact with trunk secretions or other bodily fluids. Active TB is diagnosed in elephants by means of culturing trunk wash samples. A recent report (Emerging Infectious Disease: 2011; 17; 366-371) describes an outbreak of TB among employees at a nonprofit elephant refuge in Tennessee during 2009.

In the outbreak described, routine tuberculin skin testing (TST) of refuge employees detected 13 conversions within 6 months following detection of a TB culture-positive trunk wash sample. The positive sample had been collected from an elephant that was quarantined due to exposure to another elephant known to be TB infected. Epidemiological investigation revealed that caregivers in close proximity to the quarantined elephant were not the only individuals infected. Organisms were aerosolized to adjacent administrative buildings through pressure washer cleaning of the quarantined elephant's housing. This accounted for 3 skin test conversions among those with no direct elephant contact and illustrates the highly contagious nature of tuberculosis.

Of note, the first reported U.S. outbreak of TB among elephants was reported in 1996. Since 1998, annual TB testing by trunk wash culture is required by the USDA for all captive elephants. Many of the elephants are trained to assist their keepers with sample collection. Guidelines do exist for treatment of active TB in elephants and research is ongoing to improve detection of latent infection and reduce risk of transmission among elephants and their human caretakers.