TOPICS IN NEWBORN CARE
Kelly Wright, M.D., F.A.A.P.
CoxHealth Northside Pediatrics and Adolescents

- Effects of maternal fluids on newborns after delivery
- Immunizations relevant to newborn care
- Vitamin K and erythromycin prophylaxis in newborns

MATERNAL IV FLUIDS: EFFECTS ON NEWBORN POSTPARTUM CARE
- For newborns, which fluid mom receives is less important than how much fluid.
- The type of fluid mom receives has little effect on newborn blood sugars. Hypoglycemia in newborns is caused by inadequate glycogen storage (i.e. preterm or SGA infants) and/or hyperinsulinemic state (infants of diabetic mothers, LGA infants). The amount of dextrose in D5 has little impact on mother’s or infant’s blood sugar.
- The amount of fluids mom receives can impact breastfeeding and neonatal weight loss.
FLUIDS AND BREASTFEEDING

- Large amounts of IV fluid administration can cause third-spacing in breast tissue, delay lactogenesis II (>3 days), and create edema that makes it difficult for baby to latch.
- Pitocin is also a natural anti-diuretic that can also impact a mother’s third-spacing.
- Reverse Pressure Softening can be a helpful technique for mothers who are very engorged or edematous to improve latch and comfort with nursing and pumping.

REVERSE PRESSURE SOFTENING

FLUIDS AND NEWBORN WEIGHT LOSS

- In the case of long labors, lots of IV fluids (common in epidural, cesarean births, and complicated deliveries), the birth weight may be inflated by the fluid administration.
- In these cases, the 24 hour weight may be a more accurate representation of the infant’s true weight. Most infants will diurese excess fluids within 12-24 hours.
- Using the 24 hour weight for weight loss calculations may help avoid supplementation in breastfeeding infants which improves long term outcomes for breastfeeding.
IMMUNIZATIONS IN NEWBORN CARE

- Maternal Immunizations
- Tdap
- Influenza
- MMR
- Neonatal Hepatitis B

COCOONING

- Infants can be protected from vaccine-preventable illnesses by immunizing all household contacts.
- Immunizing families and other caregivers creates a cocoon of protection around the infant, decreasing the likelihood that the infant will be exposed to an illness.

HERD IMMUNITY

- Immunization rates need to be above about 85-90% for most vaccines to provide adequate herd immunity.
- Herd immunity protects the young, the old, the sick/immunocompromised, and rare vaccine non-responders.
“Treatment without prevention is simply unsustainable.”

~Bill Gates

Tdap

- *Bordetella pertussis*: “The 100 Day Cough”
- Young children develop apnea, pneumonia, and respiratory failure
- Cough can be severe enough to cause rib fractures, pneumothorax, or aortic dissection
- Encephalopathy/seizures may occur
- 2016: 16 million infections world wide and 58,000 deaths
- Recent outbreaks in unvaccinated communities in U.S.
- Most infants contract the infection from an adult caregiver or adolescent in the home.

Tdap

- Tdap is recommended between 27-36 weeks of each pregnancy (regardless of timing of last dose) to boost maternal antibody production and provide transplacental antibodies to infant.
- If not given during pregnancy, it should be given to mothers prior to hospital discharge.
- Tdap is also recommended for any adolescent in the home or adult caregiver. Immunizations are available through Cox pharmacies.
INFLUENZA

- More than 3 million U.S. cases per year
- Mortality rates difficult to determine but range from 4,000-30,000/year in US depending on the season.
- 150 pediatric deaths/year
- Complications include pneumonia, encephalitis, myocarditis
- Pregnant and postpartum women and children under age 2 are particularly high risk for complications from influenza

“IT'S NOT YOUR INALIENABLE RIGHT TO NOT GET A VACCINE IF YOU'RE HELPING CARE FOR VULNERABLE PATIENTS.”

~ Paul Offit
Chief of Infectious Diseases
Children's Hospital of Philadelphia

INFLUENZA

- Influenza vaccine is effective. Flu vaccine in children for the 2017-2018 season provided about 50% protection. Immunized children who contract flu also tend to have milder symptoms.
- Flu vaccine in children prevents hospitalization and death from influenza.
- Flu vaccine does not cause the flu or other respiratory illness. It does not cause Guillain-Barre Syndrome. Adverse effects are mild (fever, pain at the injection site, swelling, redness).
- Individuals with egg allergies can safely receive flu vaccine in the vast majority of cases.
RUBELLA

- German Measles; mild or asymptomatic primary infection
- Rarely causes encephalitis, pneumonia
- Miscarriage or Congenital Rubella Syndrome
- CRS: deafness, heart defects, cataracts, microcephaly, thrombocytopenia and bone marrow abnormalities, blueberry muffin rash (extramedullary hematopoiesis)

RUBELLA

- MMR vaccine is typically given at 12-15 months of age and at 4-5 years of age.
- Some individuals do not have a lasting immune response, so pregnant women are screened for rubella immunity.
- Women who are rubella non-immune should receive MMR vaccine after delivery.
- MMR vaccine should not be given in pregnancy.

HEPATITIS B

- Acute and chronic infections: fever, jaundice, liver failure
- 90% of neonates infected will develop chronic hepatitis
- Chronic illness causes cirrhosis and hepatocellular carcinoma
- 1/3 of the world’s population infected with 350 million chronic infections; 750,000 deaths/yr
- Infants of infected mothers who are immunized within 12 hours of birth have 95% reduction in disease transmission.
WHAT’S THE BIG DEAL?

- Hepatitis B testing isn’t perfect. False negative tests can occur.
- Mothers will test negative if testing is done prior to seroconversion.
- Testing is typically done in the first trimester. Mothers could contract the infection later in pregnancy.
- Blood from an individual with hepatitis B is highly infectious. Even casual contact (sharing wash cloths, towels, razors, toothbrush) with an infected person can cause disease transmission.

HEPATITIS B

- Current recommendations are to immunize all infants within 24 hours of birth. Infants of hep B positive mothers should receive immunization within 12 hours along with HBIG.
- With high immunization rates, hepatitis B infection could be eliminated in the United States within 1-2 generations.

VITAMIN K PROPHYLAXIS

- Intramuscular Vitamin K is recommended for all newborns for prevention of hemorrhagic disease of the newborn.
WHY DO INFANTS NEED VITAMIN K?

- Infants have an immature hepatobiliary system that does not efficiently utilize vitamin K.
- Vitamin K storage in newborns is low due to poor placental transfer.
- Breastmilk does not naturally contain vitamin K.
- Newborns have a sterile gut, so they do not obtain vitamin K readily from gut microorganisms.
- Vitamin K is essential for vitamin K dependent clotting factors. Infants have about 20% the amount that adults have.

HEMORRHAGIC DISEASE OF THE NEWBORN

- Early onset (first 24 hours): bruising, oozing from venipuncture sites, GI bleeding, intracerebral hemorrhage. This is caused by maternal medications that interfere with vitamin K synthesis (some antibiotics, anticonvulsants, anticoagulants).
- Classical (1-4 weeks): bruising, bleeding from mucosal surfaces, GI bleeds
- Late onset (3 weeks to 8 months): intracerebral hemorrhage, death

INTRAMUSCULAR VITAMIN K

- A single dose of IM vitamin K drops risk of vitamin K deficiency bleeding to almost zero.
WHY REFUSE VITAMIN K?

- Myth: IM Vitamin K increases risk of leukemia
- Myth: IM Vitamin K causes jaundice
- Black box warning on Vitamin K: anaphylaxis
- Toxins: IM vitamin K contains sorbitol, propylene glycol, vinegar, bicarbonate, and salt.

WHY CAN’T WE USE ORAL VITAMIN K?

- Oral vitamin K degrades rapidly; serum levels drop within 7 days of administration.
- Oral vitamin K is not readily available and must be compounded. A 12 week course of oral vitamin K costs roughly $300.
- Oral vitamin K still carries a risk of VKDB (4/100,000).
WHEN FAMILIES REFUSE

- Physicians have a conversation with the family exploring reasons for refusal, providing education, and discussing risks and benefits. An educational binder is available in the newborn nursery.
- Physician should have Vitamin K refusal form completed by parents.
- Infant should go home on a regimen of weekly oral vitamin K for 12 weeks.
- Mother should supplement her diet with 5 mg vitamin K per day to theoretically increase vitamin K levels in breastmilk.

ERYTHROMYCIN OINTMENT

- Erythromycin is recommended for all infants at birth for prevention of ophthalmia neonatorum.
- Ophthalmia neonatorum is caused by gonorrhea or chlamydia.
- ON caused by gonorrhea can cause blindness in the first 24 hours.

MISSOURI LAW

- Missouri statute 210.070: “Every physician, midwife, or nurse who shall be in attendance upon a newborn infant or its mother shall drop into the eyes of such infant immediately after delivery a prophylactic solution approved by the state department of health and senior services . . .”
REASONS FOR REFUSAL

- Perceived lack of need: some patients feel they are low risk as they are in long term monogamous relationships.
- Desire to avoid any unnatural or unneeded treatment
- Concerns with bonding with infant due to temporary blurring of vision

RISKS/BENEFITS

- Risks: chemical eye irritation, temporary blurring of vision
- Benefits: reduction in ophthalmia neonatorum from all causes including chlamydia, gonorrhea, staphylococcus

WHEN PARENTS REFUSE

- Because of Missouri Law, the hospital must file a hotline report for any family that refuses eye ointment.
- This generally results in a home visit from Children’s Division after discharge.
- Eye ointment refusal form and educational materials are in development and will be available soon.
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