



Sign Up Now!
Next Session Begins
January 11, 2010

For more information:
Call 865.546.3998
or
www.BeeFit4Kids.com



GI for Kids, PLLC
East Tennessee Children's Hospital
Gastroenterology and Nutritional Services
Medical Office Building
2100 Clinch Avenue, #510
Knoxville, TN 37916

PRSR STD
U.S. POSTAGE
PERMIT NO. 433
KNOXVILLE, TN



GI for Kids, PLLC

East Tennessee Children's Hospital Gastroenterology and Nutrition Services

Fall 2009

www.giforkids.com

Volume 2 Issue 4



Friends,

This is such a great time of year; the kids are back in school, the weather is turning cooler, and the leaves are changing colors. This year, though, we in the healthcare field have extra concerns with the early outbreak of the H1N1 virus along with the annual influenza season. In the midst of treating these contagious viruses we may forget that this is the same season for rotavirus gastroenteritis. By five years of age, a child has a 1 in 200,000 chance of dying from rotavirus, a 1 in 14 chance of either an emergency room visit or hospitalization from rotavirus, and a 1 in 10 chance of requiring an outpatient visit from the virus.¹ This newsletter provides some good reminder information about rotavirus and the rotavirus vaccines currently available.

Our practice is always available to help you treat our areas children. Besides our four physicians, we have two registered dietitians and a psychologist who are always taking referrals. Please visit our website at www.giforkids.com for more information on all of the pediatric services our office provides to the area.

Sincerely,

Youhanna Al-Tawil, MD
Medical Director

Rotavirus Statistics

While rotavirus does not gain the same news headlines like the influenza virus or H1N1, it is a very contagious virus that places a significant burden on our healthcare system. In infants and children, rotavirus is the most common cause of severe diarrhea in the United States and around the world, and most children are infected by two years of age.^{2,3} In children less than five years of age, the virus is responsible for 5% - 10% of the diarrhea episodes and 40% - 50% of the diarrhea-related hospitalizations.^{1,2}

Rotavirus outbreaks are seasonal in temperate climates usually going from November to May each year with a lull in the summer months.³ Typically in the United States, outbreaks begin in the Southwest and move to the Northeast.¹ Each year rotavirus is responsible for²:

- >400,000 doctor visits
- >200,000 emergency room visits
- 55,000 – 77,000 hospitalizations
- 20 – 60 deaths

While these numbers are large, it is alarming to know that rotavirus has approximately the same number of hospitalization incidents as influenza in children aged 0-4 years.¹ This fall and winter it is going to take every health care provider's concerted effort to keep our children strong and healthy by correctly diagnosing each child, and this includes rotavirus.

1. Merck presentation. Rotavirus: disease burden and transmission. www.merckservices.com. Downloaded September 10, 2009.
2. The Centers for Disease Control. Rotavirus disease- questions & answers. <http://www.cdc.gov/vaccines/vpd-vac/rotavirus/dis-faqs.htm>. Downloaded September 15, 2009.
3. Centers for Disease Control and Prevention. About Rotavirus. http://www.cdc.gov/rotavirus/about_rotavirus.htm. Downloaded September 15, 2009.

Rotavirus Vaccines

By Kathy F. Butcher, MPH



Currently, the Food and Drug Administration (FDA) has approved two live vaccines in the prevention of rotavirus gastroenteritis in infants and children.^{1, 2} Both vaccines are given orally in either two or three doses beginning at six weeks of age. Neither vaccine is associated

with intussusception, an uncommon type of bowel obstruction, and they are both different from the rotavirus vaccine used in the late 1990's.³ Below are the specifics for each vaccine:

RotaTeq¹:

- Prevention of rotavirus caused by G1, G2, G3, G4 serotypes
- Dosage: three 2ml doses; first dose at 6-12 weeks of age with subsequent doses administered in 4-10 week intervals with the last dose not given after 32 weeks of age
- Contraindications: hypersensitivity to vaccine or any component of it
- Warnings: no safety or efficacy data are available for patients who are potentially immunocompromised, or have a history of gastrointestinal disorders

Rotarix²:

- Prevention of rotavirus caused by G1, G3, G4, G9 serotypes
- Dosage: two 1ml doses; first dose beginning at six weeks of age and second dose at least 4 weeks later with the last dose given before 24 weeks of age
- Contraindications: history of uncorrected congenital malformation of the gastrointestinal tract
- Warnings: previous hypersensitivity to any component of the vaccine including latex rubber, infants with primary or secondary immunodeficiencies; delayed administration of the vaccine to any infant with acute diarrhea or vomiting

Both the CDC's Advisory Committee on Immunization Practices (ACIP) and the American Academy of Pediatrics (AAP) do not express a preference on which vaccine to use^{4, 5}, but there is emerging evidence that the vaccines are decreasing the number of young children being hospitalized.⁶ If at all possible, vaccination should be completed with the same product. Otherwise, the series should be completed with the available product. If any of the doses were RotaTeq, a total of three doses should be given to the infant. At this time, no studies have been conducted on the interchangeability of the vaccines.^{4, 5}

1. Merck. RotaTeq prescribing information. http://www.merck.com/product/usa/pi_circulars/r/rotateq/rotateq_pi.pdf. Downloaded September 16, 2009.
2. GlaxoSmithKline. Rotarix prescribing information. http://us.gsk.com/products/assets/us_rotarix.pdf. Downloaded September 16, 2009.
3. Centers for Disease Control and Prevention. Rotavirus vaccine what you need to know. <http://www.cdc.gov/vaccines/pubs/vis/downloads/vis-rotavirus.pdf>. Downloaded September 15, 2009.
4. Centers for Disease Control and Prevention. Prevention of rotavirus gastroenteritis among infants and children. Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Morb. Mrt. Wkly. Rep. 2009;58(No. RR-2): 1-25.
5. Prevention of rotavirus disease: updated guidelines for use of rotavirus vaccine. American Academy of Pediatrics policy statement, February 11, 2009.
6. McKenna, M. Rota and pneumococcus vaccine success stories: pediatric emergency practitioners wonder, "where have the kids gone?" Annals of Emergency Medicine. Volume 53(4): April 2009, 23A-25A.

Diagnosing Rotavirus

By Youhana Al-Tawil, MD



Rotavirus primary mode of transmission is fecal-oral. It is stable in the environment, and therefore transmission can occur from ingesting contaminated food or water or coming in contact with a contaminated surface.¹ The virus survives in low humidity environments and is relatively resistant to hand soaps and common disinfectants. It takes

a relatively high concentration of alcohol, chlorine, or iodine to kill it. Consequently, outbreaks are common in childcare settings, and most children who attend them will get the virus once if not twice.²

After exposure, incubation is less than 48 hours.³ The spectrum of presenting signs and symptoms range from asymptomatic to severe dehydration, with more than half of the infections being asymptomatic.² Typical signs and symptoms include fever, upset stomach, vomiting, and diarrhea. The vomiting and diarrhea can last anywhere from 3-8 days.³ A child can have 10-20 episodes of watery diarrhea per day, and the most severe cases are usually in infants and young children aged 6-24 months.²

Positive diagnosis of rotavirus can be made through a rapid antigen detection stool sample by using an enzyme linked immunoassay (ELISA).¹ Infected stool can have 10 billion plaque forming units per gram of feces, and it only takes as little as 10 plaque forming units to cause infection.² After infection, immunity is incomplete and repeat infections can occur, although they are usually less severe than the original case.¹

In healthy infants and children, rotavirus is usually self-limiting. Since there is no antiviral agent effective against rotavirus, the primary treatment usually consists of oral rehydration to prevent dehydration.^{1, 4} Infants and children with any underlying immunodeficiency are particularly at risk for sustained symptoms. One study found that immune compromised children had diarrhea for 2-8 weeks.² It is extremely important to make sure these children stay hydrated until the

vomiting and diarrhea subside. A rehydration plan should be given to the parents of these children as soon as any signs of possible dehydration occur. See subsequent articles for more information.

1. Centers for Disease Control and Prevention. About Rotavirus. http://www.cdc.gov/rotavirus/about_rotavirus.htm. Downloaded September 15, 2009.
2. Merck presentation. Rotavirus: disease burden and transmission. www.merckservices.com. Downloaded September 10, 2009.
3. The Centers for Disease Control. Rotavirus disease- questions & answers. <http://www.cdc.gov/vaccines/vpd-vac/rotavirus/dis-faqs.htm>. Downloaded September 15, 2009.
4. American Academy of Pediatrics. Pediatric Nutrition Handbook; 6 ed. Elk Grove Village, IL: American Academy of Pediatrics; 2009: 651-658.

Replacing Fluids for a Dehydrated Child

By Ashley Rogers MS, RD, LDN



Dehydration is a physiologic disturbance due to a reduction of body fluid, and it remains one of the leading causes of morbidity and mortality in children¹. Children are more susceptible to dehydration due to their higher fluid requirements relative to weight and to the frequency

of acute illnesses associated with vomiting and diarrhea^{1, 2}. The most important treatment of dehydration for diarrhea and vomiting is intravenous fluids or an oral rehydration solution to ensure that fluid electrolyte deficits are replenished. It is proven that oral rehydration solutions should be the first line of treatment in children. They are just as effective as intravenous methods for replenishing the body with mild to moderate dehydration^{3, 4, 5}. Oral rehydration therapy is simple, effective, and low in cost. Intravenous treatment can be labor intensive, costly, and often difficult to provide but is effective for severe dehydration.

If a child is experiencing vomiting or diarrhea more than 4 times in 24 consecutive hours, an oral rehydrating solution should be initiated. Thirst should not be used as an early indicator of dehydration, by the time a child may feel thirsty they may already be dehydrated. As providers, the most important message is to educate parents of signs and symptoms of dehydration and how to respond quickly. Encourage families to keep an oral rehydrating solution at home in case vomiting or diarrhea occurs.

- (1) Feldman: Sleisenger & Fordtran's Gastrointestinal and Liver Disease, 8th ed. MD Consult. 2006. Available at www.mdconsult.com. Accessed on September 21, 2009.
- (2) Pediatric Dehydration Assessment and Oral Rehydration Therapy. Pediatric Emergency Medicine Reports. 2008. Available at www.accessmylibrary.com. Accessed on October 8, 2009.
- (3) Oral Rehydration for Children with Gastroenteritis. The Lancet Infectious Diseases; vol 6, Issue 9. 2006: 547-548.
- (4) Jeffrey Hom and Richard Sinert. Comparison Between Oral Versus Intravenous Rehydration to Treat Dehydration in Pediatric Gastroenteritis. Evidenced-based Emergency Medicine/Systematic Review Abstract; vol 54, no.1. 2009: 117-119.
- (5) American Academy of Pediatrics. Pediatric Nutrition Handbook; 6 ed. Elk Grove Village, IL: American Academy of Pediatrics; 2009: 651-658.

Nutrition Myth-Busters Diarrhea, Vomiting and Dehydration

By Sandy R. Altizer, RD, LDN



If you ask five people what to do for a vomiting child to keep them from getting dehydrated, you will probably get seven different answers. Unfortunately, most of the time these answers are based more in myth than fact. Below are a few of the most popular myths and the facts that debunk them:

Myth 1: Avoid drinking fluids for fear of vomiting

- Re-hydrate quickly to replace electrolytes such as sodium and potassium.

Myth 2: I should only eat bland foods

- The diet should be:
 - As normal as possible and practical
 - Should provide adequate calories for repair
 - Should be started as soon as possible
- The diet is:
 - No longer limited to the BRATT diet (bananas, rice, applesauce, toast and tea)
 - Should include complex carbohydrates and foods such as lean meats, yogurt, fruits, and vegetables. Avoid fatty foods and simple sugars (ie: desserts).

Myth 3: Sodas are best during acute vomiting and diarrhea

- Sweet/sugary products are high in osmolality and have low sodium concentrations making them unsuitable as an effective treatment for dehydration and could cause more osmotic diarrhea.
 - Oral rehydrating fluids should be close to the osmolality of the blood (270-285 mOsmol/L) for best results.

Finding the appropriate re-hydrating fluid

Liquid	CHO mmol/L	Na mmol/L	K mmol/L	Base mmol/L	Osmolality
Oral Rehydrating Substances	111	90	20	30	310
Pedialyte	140	45	20	30	250
Cola	700	2	0	13	750
Apple Juice	690	3	32	0	730
C. Broth	0	250	80	0	500
Sports Beverages	255	20	3	3	330

Myth 4: Drinking fluids fast will re-hydrate more quickly

- Small sips are better than gulps (5 mls every 1-2 minutes delivers 150-300 ml/hr)