

In Brief

Gastroesophageal Reflux

Sandra F. Braganza, MD
Children's Hospital at Montefiore
Bronx, NY

Author Disclosure

Dr Braganza did not disclose any financial relationships relevant to this article.

A Systematic Review of Nonpharmacological and Nonsurgical Therapies for Gastroesophageal Reflux in Infants. Carroll AE, Garrison MM, Christakis DA. *Arch Pediatr Adolesc Med.* 2002;156:109–113

Gastroesophageal Reflux Disease in Children: An Overview of Pathophysiology, Diagnosis and Treatment. Gremse DA. *J Pediatr Gastroenterol Nutr.* 2002;35:S297–S299

Guidelines for Evaluation and Treatment of Gastroesophageal Reflux in Infants and Children: Recommendations of the North American Society for Pediatric Gastroenterology and Nutrition. Rudolph CD, Mazur LJ, Liptak GS, et al. *J Pediatr Gastroenterol Nutr.* 2001;32:S1–S31

Prevalence of Symptoms of Gastroesophageal Reflux During Childhood: A Pediatric Practice-Based Survey. Nelson SP, Chen EH, Syniar GM, Christoffel KK. *Arch Pediatr Adolesc Med.* 2000;154:150–154

Gastroesophageal reflux (GER) is the passage of gastric contents into the esophagus. When the lower esophageal sphincter is not competent, gastric contents may be regurgitated all the way into the oropharynx.

Clinically, GER is most apparent in infants. Because of the small capacity of the esophagus, infants who have GER usually present with obvious vom-

iting. Although 50% or more of infants vomit recurrently in the first few postnatal months, by 10 to 12 months of age, only about 5% continue to do so, even without intervention.

Infants who have GER also can present more subtly, with irritability, anorexia, anemia, weight loss, failure to thrive, painful or difficulty swallowing, and arching of the back during feedings. Some infants have abnormal posturing of the neck while feeding, so-called Sandifer syndrome. Stridor, reactive airway disease, and recurrent pneumonias all have been described in association with GER, and although the evidence remains controversial, GER likely plays a role in some apparent life-threatening events and possibly in instances of sudden infant death syndrome (SIDS).

Beyond infancy, it is estimated that 5% to 10% of children and adolescents have symptoms of reflux at least weekly. Although some actually vomit intermittently, complaints of chest or epigastric pain, dysphagia, food impaction, or "heartburn" are more common. As with infants, affected children also can present with respiratory illness characterized by persistent cough, airway reactivity, or recurrent pneumonias.

Usually, GER can be diagnosed with a thorough history and physical examination. Esophageal pH probe monitoring, along with an accompanying symptom diary in older children, is the gold standard for diagnosing GER because it can document a temporal association between episodes of acid reflux and the presence of symptoms. A variety of imaging studies and endoscopy with biopsy also can be used in the evaluation of possible GER.

A simple treatment for infants, shown to decrease episodes of vomiting, is to thicken feedings by adding rice cereal to formula. Experience in Europe has documented that formula thickened with locust bean gum or carob flour reduces acid levels in the esophagus as well as the frequency of vomiting. Thickened formula has the added benefit of providing a higher caloric density for infants who already may be underweight from GER.

Prone positioning of infants, particularly at 30 degrees upright, also may decrease GER. Unfortunately, sleeping prone puts infants at greater risk for SIDS, outweighing the potential benefits of reducing GER in all but very exceptional cases. When an infant who has GER is awake, especially after feeding, prone positioning can be helpful.

For older children and adolescents, as well as for adults, changes in lifestyle can improve symptoms of GER. Weight reduction; dietary modifications to eliminate chocolate, caffeine, and spicy foods; and avoiding alcohol and cigarette smoking can be helpful.

No currently available pharmacologic agent targets the primary mechanism of GER directly, which is transient relaxation of the lower esophageal sphincter. Available medications can offer symptomatic relief, promote adequate weight gain and growth, and help heal the inflammatory esophagitis caused by refluxing gastric contents.

Pharmacologic therapy for GER begins with suppressing the production of gastric acid, thereby decreasing the acid delivered to the esophagus with reflux. Available agents include histamine₂ receptor antagonists and proton pump inhibitors. The proton pump inhibitors appear to be more effective,

producing a greater reduction in acid secretion and having a longer duration of action.

Antacids, both aluminum and magnesium hydroxide, neutralize gastric acid that the stomach produces. They are useful for the short-term relief of heartburn and to aid in the healing of esophagitis, but they are not recommended for infants. Their use can result in high levels of aluminum, which can be neurotoxic and are a risk for osteopenia.

Prokinetic agents enhance esophageal peristalsis and accelerate gastric emptying. Cisapride can reduce the symptoms of GER, but recently it has been withdrawn in the United States because of its association with serious cardiac dysrhythmia. Metoclopramide is another agent that has decreased the frequency and volume of reflux, but it,

too, can have adverse effects, including parkinsonian reactions and tardive dyskinesia, particularly at high doses.

An infant or child who has persistent symptoms of GER despite medical therapy and appropriate lifestyle changes can be considered for surgical treatment. Less than 0.5% of infants who have GER have symptoms severe enough to warrant surgery. The Nissen fundoplication is the procedure performed most commonly, with varying rates of success. The benefits and risks associated with medical and surgical therapies for GER among pediatric patients have not been studied definitively.

Comment: Particularly with infants, more than 50% of whom spit up regularly at least during the first few postnatal months, it can be difficult

to decide what is normal and what is not. The literature now reflects this dilemma, distinguishing between gastroesophageal reflux and gastroesophageal reflux disease. Treatment, certainly pharmacologic therapy, should be restricted to infants who evidence disease with failure to grow appropriately, recurrent pneumonias, or gastrointestinal blood loss. Even apparently benign interventions, such as thickened feedings or prone-upright positioning, may have a downside. "Medicalizing" an essentially physiologic phenomenon—spitting up—can promote parental anxiety and dis-ease about an infant, sometimes with real and unfortunate consequences. Above all, do no harm.

Henry M. Adam, MD
Editor, In Brief