

Journal of Pediatric Gastroenterology & Nutrition:

October 1999 - Volume 29 - Issue 4 - pp 475-476

Case Report

Allergy to Carob Gum in an Infant

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Received February 3, 1999; accepted May 26, 1999.

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Gastroesophageal reflux (GER) with regurgitation is common in young infants and typically resolves with increasing maturity. In most infants GER poses little or no long-term concern, but in infants with excessive regurgitation, GER can lead to failure to thrive and increase the risk of significant problems such as respiratory illness.

Most physicians prefer conservative treatment of GER. Inexpensive and effective treatments can often limit the symptoms of regurgitation and help ensure that the infant receives adequate nutrition. Several reports have described the use of thickened formulas as an effective measure for treating GER, reporting that such formulas reduce emesis ^(1,2), increase sleep time, and reduce crying ⁽¹⁾. In 1993 the Working Group on Gastro-Oesophageal Reflux of the European Society of Paediatric Gastroenterology and Nutrition (ESPGAN) noted that thickened formulas appear to be a safe approach with good clinical results ⁽³⁾. In 1996, the ESPGAN committee concluded that thickened formulas are a valuable first-line measure in relieving regurgitation in many infants ⁽⁴⁾.

Several agents have been used to thicken infant formulas as part of conservative treatment of GER. Some agents are incorporated into specific antiregurgitation (AR) formulas by the manufacturers, whereas other thickening agents may be added by parents on the advice of a physician. Bean gum preparations, sodium carboxymethylcellulose, carob seed flour, and a compound containing pectin and cellulose have been used for this purpose ⁽³⁾. The European Commission Scientific Committee for Food states that bean gum can be used in infant formula to treat GER but notes that there are no growth studies in healthy infants with long-term exposure to bean gum ⁽⁵⁾. In the U.S., rice cereal traditionally has been used as a formula thickener. These varying products possess differing biochemical structures, resulting in different effects on gastroesophageal symptoms.

We describe a 5-month-old child with GER who was allergic to an AR milk formula containing bean gum as a thickening agent.

CASE REPORT

The patient was a 5-month-old girl admitted to our hospital with explosive vomiting, urticaria, and a facial rash. The infant had received her mother's milk during the first month of life. At approximately 1 month of age, feeding was changed to a hypoallergenic (HA) milk formula that was chosen to help prevent the development of atopic disease. The patient's father had asthma and at present was allergic to dust mites and some cereal grains, and the patient's brother had experienced atopic dermatitis during the first 6 months of his life. At 2 months, the infant began to refuse meals and frequently regurgitated acid material after meals, resulting in failure to thrive. The HA formula was changed to a conventional adapted milk formula, but the infant's condition did not improve. At 3 months, the pediatrician suggested a soy protein-based formula, but this, too, was ineffective.

At 5 months, the soy formula was replaced with an AR formula (Nutrilon AR, Nutricia, Zoetermeer, the Netherlands), which contained carob bean gum as a thickening agent. After the first meal with this formula, the infant developed explosive vomiting, urticaria, and a rash on her face. She was admitted to the hospital and was treated initially with betamethasone and antihistamines. A barium study of the esophagus and scintigraphy with technetium-99 both revealed the presence of GER. Results of a blood test showed increased eosinophil count (610 cells/mm^3) and immunoglobulin (Ig) E (38 IU/ml). A fluorescent allergosorbent test (FAST) was negative for milk, α -lactalbumin, β -lactoglobulin, casein, soy, peanuts, barley, cod, and egg white but was positive for egg yolk. The patient was treated further with antiemetic drugs and antacid.

The patient was then fed with a milk-based AR formula thickened with waxy rice starch (Enfamil Pregel 1, Mead Johnson Nutritionals, Evansville, IN, U.S.A.). This formula was readily accepted, and the formula change was accompanied by significant improvement in reflux episodes. This formula was continued until the infant was 8 months of age, at which time she was challenged at our hospital with a milk formula containing carob bean gum. Urticaria and vomiting recurred within 30 minutes of administering the bean gum formula.

DISCUSSION

Our report is the first to describe allergy to carob bean gum in an infant. Others have recorded adverse reactions to carob bean flour in adults. Van der Brempt et al. ⁽⁶⁾ reported recurrent rhinitis and asthma in a man who handled carob bean flour as part of his work in a factory. Biochemical evidence suggests that the allergy was IgE mediated. When the subject stopped handling the offending product and other vegetable gums, his symptoms resolved. Scoditti et al. ⁽⁷⁾ described similar symptoms (rhinitis, asthma) in a man who routinely handled carob bean flour as part of his work as an ice cream maker.

Published studies on the use of bean gum for treating GER in infants have not evaluated immunologic parameters. Vandenplas et al. ⁽²⁾ evaluated the use of bean gum-thickened formula for 3 days in infants with regurgitation (ages, 1 week-4 months). Borrelli et al. ⁽⁸⁾ compared formulas thickened with bean gum or rice flour for a 2-week period in infants with regurgitation (ages, 5-11 months). No adverse effects were noted in these studies. Carré ⁽⁹⁾ warned that use of a carob seed preparation as a thickener could cause loose, gelatinous stools of sufficient frequency to warrant temporary withdrawal.

The wide availability of AR milk formulas containing a variety of thickening agents exposes infants to the risk of becoming sensitized to certain foods, particularly when the thickening agents are not

part of the usual food products fed to the infant in the first months of life. In the case reported herein, the child's symptoms implicated carob bean gum in the development of the allergy.

In other infants, allergic manifestations may not always be so clear as with our patient. We suggest that infants consuming AR formula containing carob bean gum be observed carefully for signs and symptoms of allergy to the thickening agents used in the AR formula. It is possible that milder signs of allergy will appear in some infants, including paradoxical worsening of GER.

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