

A rice-based diet with green banana or pectin reduced diarrhea in infants better than a rice-alone diet

Rabbani GH, Teka T, Zaman B, et al. Clinical studies in persistent diarrhea: dietary management with green banana or pectin in Bangladeshi children. *Gastroenterology*. 2001 Sep;121:554-60.

QUESTION

In Bangladeshi infants with persistent diarrhea, is a rice-based diet with green banana or pectin more effective than a rice-alone diet in reducing diarrhea?

DESIGN

7-day randomized {allocation concealed*}†, blinded (clinicians, patients, outcome assessors, and statisticians),* controlled trial.

SETTING

International Centre for Diarrhoeal Disease Research in Dhaka, Bangladesh.

PATIENTS

62 boys who were 5 to 12 months of age (mean age 8.7 mo) with a history of loose stools (> 3/d) for ≥ 14 consecutive days; absence of concurrent illness, severe infection, or severe malnutrition; no receipt of antimicrobial or antidiarrheal agents within 7 days; and ability to take oral feed. All patients completed the study.

INTERVENTION

Patients were allocated to a rice-based banana (250 g/L of cooked, green bananas) ($n = 22$), rice-based pectin (Sigma, St. Louis, MO, USA) (4 g/kg of body weight) ($n = 19$), or rice-alone diet ($n = 21$) for 7 days. All 3 diets were given in bottles, and children were fed freely by their mothers. The diets were flavored with vanilla, strawberry, or lemon to prevent observer bias.

COMMENTARY

Acute diarrheal illness claims the lives of 3 million children annually, and persistent diarrhea is an important cause of death in malnourished infants. ORS is effective in reducing mortality, but it does not reduce the volume or duration of diarrhea, which decreases its acceptance among caregivers. A recent meta-analysis showed that ORS containing cooked rice powder instead of glucose substantially reduces the rate of stool loss in cholera but not in noncholera diarrheal illness (1). The addition of indigestible (amylase-resistant) starches, which are poorly absorbed in the small intestine but converted to short-chain fatty acids in the colon (where they aid in the reabsorption of salt and water), is something new. Ramakrishna and colleagues (2) recently showed that indigestible starch (from maize) added to ORS reduced diarrhea in adolescents and adults with cholera.

The small trial by Rabbani and colleagues shows that pectin-based and green banana-based indigestible starch are similarly effective in reducing diarrheal stools and duration of illness in infants with persistent diarrhea caused by various pathogens. The efficacy of indigestible

MAIN OUTCOME MEASURES

The primary outcome was recovery from diarrhea (formed stool). Secondary outcomes were need for oral rehydration solution (ORS), need for intravenous (IV) fluid, stool frequency, vomiting, and duration of diarrhea.

MAIN RESULTS

More patients who received banana or pectin had formed stools than did patients who received the rice-alone diet. The difference was seen by day 3 and was sustained to the end of treatment (day 3 and 4 data are in the Table). The need for ORS or IV fluids was less in the banana and pectin groups than in the rice-alone group ($P < 0.05$). Patients who received banana or pectin also had greater reduction in stool frequency and weight,

vomiting, and duration of diarrhea than did patients who received the rice-alone diet (Table). The banana and pectin groups did not differ for any outcomes.

CONCLUSION

In Bangladeshi infants with persistent diarrhea, a rice-based diet containing green banana or pectin improved stool consistency and reduced the duration of diarrhea more than did a rice-alone diet.

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For correspondence: Dr. G.H. Rabbani, Centre for Health and Population Research, Dhaka, Bangladesh. E-mail rabbani@icddr.org. ■

*See Glossary.

†Information provided by author.

Rice-based banana or pectin or rice-alone diet for young, Bangladeshi children with persistent diarrhea

Outcomes	Follow-up	Banana	Pectin	Rice alone	P value (banana or pectin vs rice alone)
Proportion with formed stool	Day 3	59%	55%	15%	< 0.001
	Day 4	82%	78%	23%	< 0.001
Mean number of stools/d	Day 7	2.0	3.0	6.0	< 0.05
Mean number of vomiting episodes/d	Day 7	3.6	2.9	7.0	< 0.05
Time to develop formed stool (d)	—	4.0	4.2	8.9	< 0.05

starch in acute, noncholera diarrhea has not yet been studied, and persistent diarrhea is uncommon. However, this treatment could constitute an important advance for young children with persistent diarrhea in less developed countries in which mortality from this disorder is high. A locally prepared, inexpensive, and safe way to reduce the volume of stools is badly needed and could complement ORS as a life-saving intervention for millions of children and adults with diarrhea.

Clay Triplehorn, DO
Peter S. Millard, MD, PhD
Family Practice Residency Program
Eastern Maine Medical Center
Bangor, Maine, USA

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