Cochrane for Clinicians

Putting Evidence into Practice

Smectite for Acute Infectious Diarrhea in Children

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Clinical Question

Is smectite safe and effective for the treatment of acute infectious diarrhea in children?

Evidence-Based Answer

When compared with placebo, smectite decreases the duration of diarrhea by about a day, with a mean difference (MD) of 24.4 fewer hours of diarrhea (95% confidence interval [CI], 17.9 to 30.9 hours). Smectite also decreases stool output by 11.4 g per kg (95% CI, 0.8 to 22 g per kg). Children using smectite are more likely to have resolution of diarrhea by day 3 (number needed to treat = 2.7). There is no difference in the number of children requiring intravenous rehydration therapy or hospitalization. No serious adverse effects or deaths have been reported in children using smectite.[1] (Strength of Recommendation: C, based on consensus, disease-oriented evidence, usual practice, expert opinion, or case series.)

Practice Pointers

Acute diarrhea is the passage of three or more loose stools per day.[2] In the United States, diarrhea accounts for 1% of deaths in patients younger than five years.[3] Diarrhea is commonly caused by infection from contaminated food and water, or transmitted via fecal-oral route.[3] Smectite is a natural, medicinal clay formed from sheets of aluminum and magnesium silicate.[1] It is an oral adjuvant for diarrhea that is used outside of—and not commonly available in—the United States.[1] It typically comes as a powder that is dissolved in water and is available without a prescription. Smectite is proposed to reduce gut inflammation, reduce toxin penetration by acting as a barrier, and increase water absorption.[1]

This Cochrane review included 18 trials with 2,616 children. Studies were conducted in high-income and low- to middle-income countries (the United States was not represented) and included hospital and ambulatory settings. Most studies involved infants and children one to 24 months of age, although nine studies also included children up to 12 years of age. Both breastfed and nonbreastfed children were represented. Rotavirus was the most commonly reported etiology of diarrhea. Smectite administration varied from 1 to 6 g per dose, at intervals of one to four times per day, with varying durations (i.e., from three to six days or until recovery).

The primary outcome for the Cochrane review was duration of diarrhea. Fifteen studies (2,209 participants) reported duration with varying definitions for resolution (i.e., time to last loose stool, time to first formed stool, time to first soft or formed stool, and time to normalization of stool). The mean duration of diarrhea in the smectite group was 24.4 fewer hours than in the control group (95% CI, 17.9 to 30.9). More participants in the smectite group achieved resolution of diarrhea by day 3 (number needed to treat = 2.7; 95% CI, 1.5 to 9.8).

The secondary outcomes evaluated were stool frequency, volume of stool output, the need for hospitalization, and the need for intravenous access for rehydration. Children stooled less frequently when treated with smectite (MD = 1.3 fewer episodes per day; 95% CI, 0.4 to 2.3 fewer episodes) and, when they did, had decreased stool output (MD = 11.4 g per kg; 95% CI, 0.8 to 21.9 g per kg). There was no difference in the need for hospitalization or the need for intravenous access for rehydration.

These are summaries of reviews from the Cochrane Library.

This series is coordinated by Corey D. Fogleman, MD, Assistant Medical Editor.

A collection of Cochrane for Clinicians published in *AFP* is available at https://www.aafp.org/afp/cochrane.

CME **This clinical content** conforms to AAFP criteria for continuing medical education (CME). See CME Quiz on page 292.

SUMMARY TABLE: SMECTITE VS. CONTROL FOR ACUTE INFECTIOUS DIARRHEA IN CHILDREN

Outcomes	Anticipated absolute effects		Number of participants (number of studies)	Quality of evidence
	Risk with control	Risk with smectite (95% CI)		
Duration of diarrhea	Mean of 32.6 to 118.9 hours	MD = 24.4 fewer hours (17.9 to 30.9)	2,209 (15 RCTs)	Low
Clinical resolution at day 3	342 per 1,000	718 per 1,000 (445 to 1,000; NNT = 2.7 [1.5 to 9.8])	312 (5 RCTs)	Low
Stool frequency	Mean of 1.9 to 3.2 episodes per day	MD = 1.3 fewer episodes per day (0.4 to 2.3)	954 (3 RCTs)	Very low
Stool output	Mean of 90.7 to 118.8 g per kg	MD = 11.37 g per kg decrease (21.94 to 0.79 g per kg)	634 (3 RCTs)	Low
Need for hospitalization	85 per 1,000	79 per 1,000 (64 to 98)	885 (2 RCTs)	Low
Need for intravenous access for rehydration	676 per 1,000	520 per 1,000 (365 to 750)	81 (1 RCT)	Moderate
Adverse effects: constipation	0 per 1,000	61 per 1,000	128 (2 RCTs)	Low

CI = confidence interval; MD = mean difference; NNT = number needed to treat; RCT = randomized controlled trial.

No serious adverse effects or deaths were reported in any of the studies. Constipation was the most commonly reported adverse effect of smectite, although there were few events.

Current National Institute for Health and Care Excellence guidelines focus on preventing and managing dehydration for children with diarrhea and vomiting and specifically recommend against using antidiarrheal medications.[4] Smectite could be of benefit in countries with limited availability of oral or intravenous rehydration therapy, especially in patients with preexisting malnutrition.

The practice recommendations in this activity are available at http://www.cochrane.org/CD011526.

Editor's Note: The numbers needed to treat and confidence intervals reported in this Cochrane for Clinicians were calculated by the authors based on raw data provided in the original Cochrane review.

The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Department of the Navy, Uniformed Services University of the Health Sciences, Department of Defense, or the U.S. government.

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Different Durations of Corticosteroid Therapy for COPD Exacerbations

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Clinical Question

Are shorter courses of systemic corticosteroid therapy as safe and effective as conventional, longer courses for

patients with exacerbations of chronic obstructive pulmonary disease (COPD)?

Evidence-Based Answer

Treatment of acute exacerbations of COPD with a shorter course of systemic corticosteroids (seven or fewer days) is likely to be as effective and safe as treating with longer courses (more than seven days). There is no significant difference in adverse effects between shorter and longer courses.[1] (Strength of Recommendation: B, based on inconsistent or limited-quality patient-oriented evidence.)

Practice Pointers

COPD is a chronic, progressive lung condition resulting in airflow limitations. Patients with COPD are at risk of acute exacerbations, which may present as dyspnea, increased cough, and sputum production. Systemic corticosteroids are a mainstay of treatment, but the necessary duration of treatment is debated. The authors of this review assessed whether a shorter course of systemic corticosteroids (seven or fewer days) was as safe and effective as the more conventional 10- to 14-day course.

This Cochrane review included eight studies and 582 patients.[1] Five of the studies, which included 519 patients, were hospital based; the remaining three did not specify location. No studies specified whether patients completed the entire treatment course in the hospital. The mean age of participants was 65 to 73 years, and the proportion who were men ranged from 58% to 84%. The studies were conducted in Switzerland, Egypt, Bangladesh, China, Turkey, Thailand, and New Zealand. Only three studies discussed co-interventions, which varied among the studies but included oxygen, inhaled or nebulized bronchodilators, inhaled steroids, theophylline, and, in one study, an histamine H_2 antagonist. When co-interventions were specified, they were applied to all participants. Two of the studies treated all patients with antibiotics, although details were not provided. One study used antibiotics only if indicated by certain clinical features. The effect of co-interventions was not included in this review.

Five studies used oral prednisolone, one study used intravenous methylprednisolone, and two studies used a combination of oral and intravenous corticosteroids. Shorter courses of corticosteroids ranged from three to seven days of treatment; longer courses ranged from 10 to 15 days. This review did not discuss whether three days of treatment is equivalent to other courses of up to seven days of treatment. The studies included only patients with severe to very severe COPD, although the criteria for this were not well-defined or consistent among studies. Three studies used pulmonary function testing diagnostic criteria, but even those criteria were not uniform. Primary outcomes included treatment failure, relapse after treatment, and adverse drug effects.

Treatment failure was assessed in four studies (n = 457), as was relapse (n = 478). Adverse effects that were studied included hyperglycemia (n = 345), hypertension (n = 311), and "other" (n = 503), which included gastrointestinal bleeding, symptomatic gastrointestinal reflux, symptoms of congestive heart failure or ischemic heart disease, sleep disturbance, fractures, or depression. There was no difference in any primary outcomes between patients who were treated with systemic corticosteroids for seven or fewer days and those who were treated for more than seven days. The investigators rated the evidence for primary outcomes as moderate, with imprecision as a reported limiting factor.

As noted, the studies did not specifically address outpatient therapy for COPD exacerbations and excluded patients with mild or moderate COPD. Current guidelines from the Global Initiative for Chronic Obstructive Lung Disease recommend treating acute exacerbations of COPD with oral prednisone, 40 mg per day for five days in most patients.[2]

The practice recommendations in this activity are available at http://www.cochrane.org/CD006897.

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