Review: Lactobacillus is safe and effective for treating children with acute infectious diarrhoea


QUESTION: In children with acute infectious diarrhoea (ID), is treatment with Lactobacillus safe and effective for improving clinical outcomes?

Data sources
Studies were identified by searching Medline, EMBASE/Excerpta Medica, the Cochrane Controlled Trials Register, DARE, and CINAHL from 1966 to 2000, and AMED, MANTIS, the Complementary and Alternative Medicine Citation Index, and AltHealthWatch from 1985–2000. Search terms used were diarrhoea, gastroenteritis, or rotavirus combined with competitive inhibition, Lactobacillus, probiotic, yogurt, or yoghurt. Bibliographies of relevant papers were scanned, and key investigators were contacted.

Study selection
Randomised controlled trials (RCTs) were selected if they involved Lactobacillus treatment of ID in children, clinical outcomes were reported, the treatment group received Lactobacillus and the control group received a suitable placebo, the Lactobacillus and control groups were indistinguishable, and data assessors were blinded to participant treatment group. Studies in which patients had recently received antibiotics were excluded.

Data extraction
Data were extracted on study and participant characteristics, strain of Lactobacillus, definition of diarrhoea, infectious pathogens, adverse effects, and such outcomes as duration and frequency of diarrhoea.

Main results
26 studies were identified, and 9 studies were included. 8 studies involved only hospitalised children. In all 9 studies, children received at least oral rehydration solution in addition to Lactobacillus or control. Meta-analysis showed that children who received Lactobacillus had a shorter duration (mean reduction 0.7 d, CI 0.3 to 1.2 d; 7 studies) and less frequent diarrhoea on day 2 (mean reduction in number of stools 1.6/d, CI 0.7 to 2.6/d; 3 studies) than did those who received a control intervention. Subgroup analyses showed that Lactobacillus reduced the duration of diarrhoea more than did control interventions in 5 studies done in developed countries (mean reduction 0.8 d, CI 0.1 to 1.5 d), in 6 studies that used only live Lactobacillus preparations (mean reduction 0.8 d, CI 0.3 to 1.3 d), and in studies that included children with ID of all causes (not just rotavirus) (mean reduction 0.5 d, CI 0.1 to 1.0 d). Adverse reactions consistent with signs and symptoms of ID were generally similar in children who received Lactobacillus and those who received a control intervention.

Conclusion
In children with acute infectious diarrhoea, treatment with Lactobacillus is safe and effective for reducing the duration and frequency of diarrhoea.

COMMENTARY
The use of probiotics is well accepted. Although the exact mechanism by which this treatment accelerates recovery from infectious diarrhoea is not known, it is used medically. In this meta-analysis by Van Niel et al, treatment with Lactobacillus is effective for accelerating the recovery from infectious diarrhoea. The effect size was a decreased duration of diarrhoea of 0.7 days and a reduction of 1.6 stools on day 2 of treatment. Because the estimates of the effect of Lactobacillus treatment are statistically significant, should we use Lactobacillus regularly in treating gastroenteritis in children? Several considerations should be made before accepting a universal recommendation based on the results of this meta-analysis. It is important to note that different types of lactobacilli may have different effect sizes. Furthermore, Van Niel et al combined the results of Lactobacillus GG, L reuteri, L acidophilus, and L bulgaricus, which may not be appropriate. Marked differences exist in the amounts of bacteria given to patients in different trials, in the different preparations of Lactobacillus, and in the amounts that are commercially available in different food products. In this meta-analysis, a clear dose-response relationship was found. Thus, in practice, doses should contain ≥ 10⁹ colony-forming units of Lactobacillus and be given ≥ 2 times daily.

Van Niel et al concluded that Lactobacillus is safe when given to children with diarrhoea. However, only 591 patients were exposed to Lactobacillus in the studies included in this meta-analysis. In the elderly, individual cases of serious infections caused by Lactobacillus have been reported.1 I would agree with Van Niel et al that the studies available so far are encouraging, but more data are needed before a universal recommendation of the use of Lactobacillus can be made.

Mattti Uhari, MD PhD
University of Oulu
Oulu, Finland


Source of funding: Agency for Healthcare Research and Quality.

For correspondence: Dr C W Van Niel, University of Washington, Seattle, WA, USA. Email cvanniel@u.washington.edu.