Review: probiotics are effective in preventing antibiotic-associated diarrhoea


QUESTION: In patients being treated with antibiotics, does co-administration of probiotics reduce the incidence of diarrhoea?

Data sources
Studies in any language (with English abstracts) were identified by searching Medline (1966–2000) with the terms probiotics, biotherapeutic agents, lacticocilli, antibiotic associated diarrhoea, and Clostridium difficile; the Cochrane Controlled Trials Register; and the Cochrane Database of Systematic Reviews.

Study selection
Studies were selected if they were randomised, double-blind, placebo-controlled trials of probiotic treatment given in combination with antibiotics and diarrhoea prevention was reported.

Data extraction
Data were extracted on sample size; type, dose, and duration of probiotic treatment; and antibiotic studied. The outcome of interest was prevention of diarrhoea. Diarrhoea was defined as a change from the normal bowel habit with ≥2 loose or watery stools for ≥2 days.

Main results
9 trials (1214 patients) met the selection criteria. 2 of the trials studied children. No statistical heterogeneity or publication bias was detected among the 9 trials. The pooled odds ratio (OR) showed that probiotic treatment was more effective than placebo in the prevention of diarrhoea (0.37, 95% CI 0.26 to 0.53). 4 trials that used Saccharomyces boulardii (yeast trials) also favoured probiotic treatment (OR 0.39, CI 0.25 to 0.62) as did 5 that used lactobacilli or enterococci (non-yeast trials) (OR 0.39, CI 0.25 to 0.62). Their analysis yields impressive ORs that show that probiotics seem to decrease the incidence of antibiotic-associated diarrhoea.

Conclusion
In patients being treated with antibiotics, co-administration of probiotics reduces the incidence of diarrhoea.

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For correspondence: Dr A L D’Souza, Hammersmith Hospital, London, UK. Email aloysius.dsouza@ic.ac.uk.
A modified version of this abstract also appears in Evidence-Based Nursing.

COMMENTARY
The incidence of antibiotic-associated diarrhoea in hospitals ranges from 3.2% to 29%.1 Antibiotic-associated diarrhoea has been associated with an increased number of days of hospitalisation and higher medical costs. Probiotics are becoming increasingly available, and their lack of side effects makes them a particularly attractive option for preventing antibiotic-associated diarrhoea.

However, several points should be considered when interpreting the results. Firstly, clinical heterogeneity limits the potential generalisability of the results. The 9 studies had differences in probiotic agents administered, dosages, duration of administration of probiotic agents, and antibiotics. Secondly, the confidence intervals in this review may be too narrow because the authors used a fixed-effects model for analysis instead of the more conservative random-effects model; the latter may be more appropriate because statistical tests of heterogeneity in meta-analyses may have low statistical power.2

Does this review provide strong enough evidence to integrate the use of probiotics into practice? My answer would be “no,” mainly because of the clinical heterogeneity of the agents used thus far in published studies. The authors have appropriately written a conservative concluding statement in their review. I hope that future clinical trials will give a more definitive answer as probiotics undergo increasing scrutiny and standardisation.3 Future trials need to be characterised with the same scientific rigour that is applied to standard drugs.

Anthony D Harris, MD, MPH
University of Maryland
Baltimore
Maryland
USA


Probiotics vs placebo to prevent antibiotic-associated diarrhoea

| Outcome | Weighted event rates | | |
|---------|---------------------|-----|-----------------|----------------|
|         | Probiotics | Placebo | RBI (95% CI) | NNT (CI) |
| Proportion of patients without diarrhoea | 90% | 78% | 15% (9 to 20) | 9 (7 to 13) |

*Abbreviations defined in glossary; RBI, NNT, and CI calculated from data provided by author using a fixed-effects model.*
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