Probiotics for the treatment or prevention of atopic dermatitis: a review of the evidence from randomized controlled trials

Betsi GI, Papadavid E, Falagas ME

CRD summary
This review concluded that probiotic administration to pregnant women or infants at high risk of atopic dermatitis appeared effective for preventing atopic dermatitis and probiotic treatment can reduce severity. There was little effect on inflammatory markers. The treatment conclusions were based on only three small studies and given the limitations of the review methods should be treated with caution.

Authors' objectives
To review the effectiveness of probiotics for the treatment or prevention of atopic dermatitis in children.

Searching
PubMed, EMBASE and The Cochrane Library were searched from 1997 to 2007; search terms were reported.

Study selection
Randomised, controlled, double-blind trials that compared probiotics with placebo for the prevention or treatment of atopic dermatitis were eligible for inclusion. For treatment the primary outcomes were: reductions in severity of atopic dermatitis; changes in cytokines at the end of treatment and for children at four or eight weeks after the end of treatment. For prevention the participants of interest were pregnant women or children at high risk of atopic dermatitis and the outcome was development of atopic dermatitis. Secondary outcomes were changes in faecal lactobacilli, markers of intestinal barrier function and plasma lipids.

Included studies of treatment were mostly in infants (less than 18 months old), although a few included children up to the age of 13; participants had either moderate to severe atopic dermatitis, atopic eczema, suspected cows milk allergy, general atopic dermatitis or atopic eczema/dermatitis syndrome. Included studies of prevention were of infants (aged 0 to 12 months), pregnant or lactating women with a family history of atopic dermatitis and their infants. Probiotic treatments varied between studies.

The authors stated neither how studies were selected for the review nor how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
Data on treatments and outcomes were extracted. The most commonly used assessment tool was the SCORAD (scoring atopic dermatitis) questionnaire and the change before and after treatment was compared between treatments.

The authors stated neither how data were extracted for the review nor how many reviewers performed the data extraction.

Methods of synthesis
Results were presented in a narrative synthesis, grouped by whether they related to treatment or prevention.

Results of the review
It appeared that 11 trials were included for treatment (n=1,115) and four for prevention (n=1,429), although the authors reported 10 and three studies.

Treatment: Three studies found a statistically significant reduction in SCORAD compared with placebo in infants with
atopic dermatitis with or without a cows milk allergy one or two months after probiotic administration (Lactobacillus rhamnosus GG or Bifidobacterium lactis Bb-12). Another study reported a significant reduction in SCORAD after 12 weeks of treatment with these same probiotics, compared with placebo in food-sensitised children. Other studies reported significant reductions for the probiotic groups, but no significant differences between probiotics and placebo. Other results for laboratory outcomes were reported in the paper.

Prevention: Three studies of Lactobacillus rhamnosus GG alone or with other probiotics given to pregnant women for two to four weeks before labour followed by treatment post-birth for up to six months with the same probiotics resulted in significantly lower rates of atopic dermatitis during the first two years of life compared with placebo.

Authors' conclusions
Probiotic administration of especially *L. rhamnosus* GG to infants at high risk of atopy and/or their mothers appeared effective for prevention of development of atopic dermatitis. Probiotic treatment for one or two months appeared to also reduce the severity of atopic dermatitis, but probiotics had little effect on most of the inflammatory markers measured.

CRD commentary
This review had a clearly stated question and specified inclusion criteria for study design, intervention and outcomes. The search covered three relevant databases. It was not reported whether there were any language restrictions, which meant that some relevant studies may have been missed. It was unclear whether systematic review methods were used for reducing errors (such as having two reviewers perform each aspect independently), which increased the risk of reviewer error and bias. Study validity was not formally assessed, although the review only included randomised, double-blind trials with a placebo control; the authors highlighted methodological limitations of the evidence. Results were described narratively, although there was some discrepancy between the numbers of studies in the tables and the numbers reported in the text, and not all outcomes were reported clearly. The authors' conclusions about the prevention of atopic dermatitis appeared justified by the evidence presented, but the conclusion about treatment was based on only three small studies and given the review limitations should be treated with caution.

Implications of the review for practice and research
Practice: The authors did not state any recommendations for practice.

Research: More RCTs were needed to evaluate where probiotics were effective for treating or preventing atopic dermatitis, and which probiotics were most effective.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.