Efficacy of probiotics in irritable bowel syndrome: a meta-analysis of randomized controlled trials

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CRD summary
This review evaluated whether probiotics could improve clinical symptoms of patients with irritable bowel syndrome. The authors concluded that probiotics may improve irritable bowel syndrome symptoms compared to placebo. The review appeared well conducted and the authors’ conclusions are likely to be reliable.

Authors’ objectives
To assess whether probiotics can improve the symptoms of patients with irritable bowel syndrome.

Searching
PubMed, EMBASE, Scopus, Web of Science and Cochrane Central Register of Controlled Trials were searched from 1996 to September 2007. Search terms were reported. Additional studies were searched for in reference lists of retrieved articles, published meeting abstracts and controlled trials that investigated clinical improvement of irritable bowel syndrome with probiotics. No restrictions were placed on language.

Study selection
Randomised controlled trials (RCTs) that investigated clinical improvement with probiotics in patients with irritable bowel syndrome were eligible for inclusion. Included were placebo controlled trials of probiotics (in singular or compound form) within the groups Bifidobacterium, Lactobacillus and Streptococcus salivarius ssp. thermophilus. Treatment duration was four to 24 weeks. Dosage varied. The ages of participants ranged from 11 to 51 years. Most participants were female. Reported outcomes were quality of life, pain (measured by the Faces Pain Scale), use of medication for abdominal pain, school absenteeism, relief of irritable bowel syndrome symptoms, decreased symptom score, relief of bloating and improvement in gastrointestinal function. Studies were excluded if the outcomes related to probiotic efficacy. Diagnosis of irritable bowel syndrome was determined by Rome criteria; studies using other diagnostic criteria were excluded. Three independent reviewers selected studies for inclusion in the review.

Assessment of study quality
Study quality was assessed by using the Jadad score (based on randomisation, blinding and withdrawals). Studies that scored 2 or less (out of a possible 5) were considered to be low quality. The authors did not state how many reviewers performed the quality assessment.

Data extraction
Three reviewers independently extracted data on the proportions of patients who demonstrated clinical improvement in both groups (experimental/placebo) to calculate relative risk (RR) and 95% confidence interval (CI). All data was extracted in the form of 2x2 tables.

Methods of synthesis
Meta analysis was performed to calculate the pooled RR and 95% CIs, using the Mantel-Haenszel, fixed effect method. Included studies were weighted by sample size versus clinical improvement. Heterogeneity was investigated using the Cochrane Q test. Heterogeneity within the effects estimated was explored using the L’Abbe plot. Funnel plots were used to assess publication bias. Sensitivity analysis was performed to explore the exclusion of low quality studies.

Results of the review
Eight randomised placebo controlled clinical trials (n=1,011) were included in the meta analysis. Two studies were of low quality and the rest scored high (3 or above). The range of follow-up was four to 48 weeks.

Probiotics were reported to significantly increase clinical improvement compared to placebo (RR 1.22, 95% CI: 1.07 to 1.4, p=0.0042). Clinical improvement was reported as 53.1% (292/550) in probiotic groups compared to 44.9% (167/372) in the placebo group.
Elimination of low quality studies from the meta analysis did not significantly influence the result. No publication bias was reported. No evidence of heterogeneity was found.

**Authors' conclusions**
Probiotics may improve irritable bowel syndrome symptoms compared to placebo.

**CRD commentary**
The review question was clearly stated. The inclusion and exclusion criteria were both clearly described. A number of relevant sources were searched and attempts were made to minimise language bias. Study selection and data extraction were conducted in triplicate to minimise reviewer bias and error. It was unclear whether the same process was adopted for quality assessment. Most of the studies were high quality when measured by the Jadad scale. The data synthesis appeared to be appropriate in the absence of statistical heterogeneity, although clinical variation was apparent among the trials. Overall this was a well-conducted review and it is likely that the authors' conclusions are reliable.

**Implications of the review for practice and research**
**Practice:** The authors stated that probiotics could be used as a supplement to standard therapy in patients with irritable bowel syndrome.

**Research:** The authors did not state any implications for research.

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