Use of Lactobacillus probiotics for bacterial genitourinary infections in women: a review
Barrons R, Tassone D

CRD summary
This review investigated the efficacy and tolerability of lactobacilli for the treatment and prevention of bacterial vaginosis and prevention of urinary tract infection, but definitive conclusions could not be drawn due to limitations in the identified evidence. Due to flaws in the review process, the reliability of the authors' conclusions is unclear.

Authors’ objectives
To assess the efficacy and tolerability of lactobacilli for the treatment or prevention of bacterial vaginosis (BV) and prevention of recurrent urinary tract infection (UTI).

Searching
MEDLINE (until November 2007), ClinicalTrials.gov, and the Cochrane Library (second quarter of 2007) were searched for articles in English and search terms were reported. The starting date for searches was not reported.

Study selection
Eligible studies were randomised controlled trials (RCTs). Inclusion criteria for participants, interventions, and outcomes were not specifically reported, but search terms indicated that the intervention was Lactobacillus-containing probiotics and outcomes were bacterial urogenital infections. The inclusion criteria for the individual trials were provided in tables.

In the included trials, participants were mostly premenopausal with either clinical confirmation of BV diagnosis (by Nugent score or Amsel criteria) or history or signs and symptoms of UTI. Some participants were in their first trimester of pregnancy. Many were required to have no evidence of other infections such as sexually transmitted diseases and in many trials, previous medications, likely to affect the results, were not permitted. Different types of Lactobacillus were administered either as oral capsules, drinks or yoghurt, or in vaginal suppositories, tampons or douches. Treatment durations varied and trial controls were active, placebo, or no treatment. Outcomes included either clinical cure of BV, reduction of recurrent episodes or symptom resolution of BV, or reduction in symptomatic UTI.

The authors did not state how the papers were selected for review nor how many reviewers performed the selection.

Assessment of study quality
The authors did not state whether a validity assessment was performed nor how many reviewers performed the assessment. Details of study design, such as blinding (double, single or open-label), large attrition rates, and whether the studies had placebo or active treatment controls, were documented in tables.

Data extraction
The authors did not state how the data extraction was performed nor how many reviewers undertook data extraction.

Methods of synthesis
Studies were combined in a narrative synthesis, supported by details in tables. Separate syntheses were made for the prevention or treatment of BV and the prevention of recurrent UTI.

Results of the review
Seven RCTs (n=600 participants) of lactobacilli for the treatment or prevention of BV and four RCTs (n=292) for the prevention of recurrent UTI were included. Sample sizes ranged from 40 to 187 patients, with most studies including less than 100. For assessment of BV, three trials were double-blind placebo-controlled and four had active controls, one of which was single-blind and another open-label; follow-up ranged from four to eight weeks. For assessment of UTI, two trials were double-blind (one of which was placebo-controlled), one was open-label and one was a multi-centre blinded study with an active control; follow-up ranged from six months to one year.
**BV:** Three out of seven trials reported either enhanced cure rates (60% to 88% in treatment groups compared with less than half this effect in control groups) or a reduced recurrence of BV (35% reduction in treatment group compared to control group). The other four trials reported no beneficial effect of lactobacilli in the treatment of BV.

**UTI:** One out of four trials reported a 73% reduction in episodes of recurrent UTI compared with the previous year in both groups (probiotics and *Lactobacillus* growth factor); the other three studies found no beneficial effects of *Lactobacillus*-containing probiotics on recurrence of UTI.

Five trials reported that *Lactobacillus* therapy was well tolerated based on the absence of discontinuations and either an absence of adverse events or a similar number of adverse events between groups.

**Authors’ conclusions**

It was not possible to give any recommendations for the use of *Lactobacillus*-containing probiotics in the treatment of BV or prevention of UTI because of limitations in the sample size, product stability, strain-specific effects, and dosing strategies of the trials.

**CRD commentary**

This review had clearly stated criteria for study design, but not for participants, interventions and outcomes. The details of these were provided in tables. The authors searched three relevant databases, but restricted studies to those published in English and did not report whether efforts were made to find other studies by reviewing reference lists and searching for unpublished data. This means it is possible that relevant studies were missed. The authors did not report that study quality was assessed, but some details such as blinding and attrition were reported in tables. There was potential for bias and error throughout the review process as no detail was given on how each stage (study selection, quality assessment and data extraction) was conducted.

Follow-up in the included studies appears to have been appropriate for treatment of BV and for prevention of UTI. Clinical and methodological heterogeneity and lack of reporting of relevant outcomes are major limitations of this review. Type of bacterial strain and delivery and dosage of the intervention varied between the trials, many failed to validate the dosing strategy and the criteria used for measurement of outcomes was not always appropriate. High patient attrition in the one study that assessed prevention of BV may have biased these results. Only one trial reported compliance outcomes, six trials provided information on adverse events and very few assessed product integrity. Only two of the seven trials, that found no significant therapeutic effects of lactobacilli, had sufficient statistical power to detect an effect.

The authors’ cautious conclusions reflect the limited evidence presented. Given the substantial limitations of the trials and the review process, the reliability of the conclusions is unclear.

**Implications of the review for practice and research**

**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that further RCTs should be undertaken with sufficient power to detect treatment effects. These RCTs should use *Lactobacillus* strains and dosing strategies that have documented efficacy and use procedures for monitoring the integrity of probiotic products throughout the trial.

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**Bibliographic details**


**PubMedID**
Record Status
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.