Probiotics in antibiotic-associated diarrhoea

A systematic review suggests that probiotics can reduce antibiotic-associated diarrhoea.

**Overview:** Probiotics are live organisms that are intended to provide a positive health benefit when consumed. Common strains include species of Lactobacillus and Bifidobacterium bacteria. Increasing evidence suggests that probiotics may be beneficial in a range of gastrointestinal conditions, including diarrhoea related to antibiotic use. Up to 30% of people who take antibiotics have associated diarrhoea, either during treatment or up to 2 months afterwards ([Barbut and Meynard 2002](#)).

*C. difficile* is an anaerobic bacterium that is present in the gut but rarely causes problems in healthy people, because it is kept in check by the normal bacterial population of the intestine. Antibiotics disrupt the balance of bacteria and can allow overgrowth of bacteria that cause diarrhoea, such as *C. difficile*.

**Current advice:** Probiotics may help to maintain or restore the normal bacterial population of the intestine, which may reduce antibiotic-associated diarrhoea. However, licensed preparations of probiotics are not currently available in the NHS. NICE has no formal guidance on the use of probiotics for preventing or treating antibiotic-associated diarrhoea.

NICE Clinical Knowledge Summary on antibiotic associated diarrhoea notes that probiotics should not be recommended for treatment and prevention of *C. difficile* infection.

**New evidence:** A systematic review and meta-analysis of 63 randomised controlled trials (RCTs, n=11,811) evaluated the evidence for probiotic use in the prevention and treatment of antibiotic-associated diarrhoea ([Hempel et al. 2012](#)). Probiotics reduced the risk of antibiotic-associated diarrhoea (pooled relative risk=0.58, 95% CI 0.50 to 0.68, p<0.001), which equates to a number needed to treat of 13. This result was consistent across several subgroup and sensitivity analyses.

However, there was significant heterogeneity across studies and evidence was insufficient to determine whether the association varied by population, antibiotic characteristics, or probiotic preparation.

Most trials used blends of probiotics, primarily Lactobacillus alone or in combination with other genera. However, the probiotic strains used were poorly documented and assessment of probiotic-specific adverse events was lacking. The authors suggested that future studies should address factors such the strains or blends of probiotics, patient characteristics, and type of antibiotic. Further trials should also explicitly assess possible adverse events.

**Commentary:** "Probiotics are an attractive concept as a preventive or therapeutic option in several conditions. The key difficulty is how one or a few microbial species could have fundamental effects on the gut microflora, especially when these are altered in the face of antibiotic exposure."
"The take home messages from this systematic review and meta-analysis are limited by the poor quality of the included papers. There are hints that some probiotics could have use in antibiotic-associated diarrhoea, but the published studies demonstrate wide heterogeneity. This probably relates to the rigour of the component trials and the use of different probiotic preparations. This approach is similar to grouping different antibiotics together and asking the question whether collectively they effectively treat a particular infection; in reality, some may be more (or less) effective and some ineffective or detrimental.

"The latest results do not suggest a need for change in clinical practice. Rather, robust data are needed on which probiotics, if any, could yield benefit and for which specific populations. We know that the gut microflora is extremely complex and is potentially disrupted for weeks or months after antibiotic administration. Faecal transplantation has been used to treat recurrent *C. difficile* infection, and as such could be considered as the 'ultimate probiotic'. Identifying the key components of the human gut microflora in maintaining the normal microbial equilibrium is likely to be the best way of designing and defining optimum probiotic-based disease management." – **Professor Mark Wilcox, Lead on C. difficile infection in England for the Health Protection Agency.**

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