

Strain specificity of probiotics for the prevention of antibiotic associated diarrhea

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Abstract

Background. As the use and diversity of probiotic products expands, the choice of an appropriate type of probiotic is challenging for both medical care professionals and the public alike. Two vital factors in choosing the appropriate probiotic are often ignored, namely the probiotic strain-specificity and disease-specificity for efficacy. Reviews and meta-analyses often pool together different types of probiotics, resulting in misleading conclusions of efficacy.

Methods. A systematic review of the literature (1970-2017) assessing strain-specific and disease-specific probiotic efficacy was conducted. Trials were included for probiotics with an identifiable strain (either single strain or mixtures of strains) that had at least two randomized, controlled trials for each type of disease indication. The goal was to determine if probiotic strains have strain and/or disease specific efficacy.

Results. We identified 216 trials. Strong efficacy evidence was found with 9 (75%) of probiotic strain(s) among four preventive indications and 11 (69%) probiotic strain(s) among four treatment indications. Strain-specific efficacy for preventing adult AAD was clearly demonstrated within the *Lactobacillus* species [e.g., by the mixture of *L. acidophilus* CL1285, *L. casei* LBC80R and *L. rhamnosus* CLR2 (Bio-K+®), by *L. casei* DN114001 (Actimel®) and by *L. reuteri* 55730], while other *Lactobacillus* strains did not show efficacy. Significant disease-specific variations in efficacy was demonstrated by *Lactobacillus rhamnosus* GG and *Saccharomyces boulardii* CNCM I-745, as well as other probiotic strains.

Conclusions. Strong evidence was found supporting the hypothesis that the efficacy of probiotics is both strain-specific and disease-specific. Clinical guidelines and meta-analyses need to recognize the importance of reporting outcomes by both specific strain(s) of probiotics and the type of disease. The clinical relevance of these findings indicates healthcare providers need to take these two factors into consideration when recommending the appropriate probiotic for their patient.

Biography

Dr. Lynne McFarland completed her PhD in 1988 in Epidemiology at the University of Washington in Seattle, Washington on the Epidemiology of *Clostridium difficile* infections. She has continued her research of risk factors, transmission and treatments of *C. difficile* infections since then and has branched out to include the clinical therapeutic applications of probiotics. She is an affiliate Associate Professor at the University of Washington. Dr. McFarland is also an international speaker and recognized expert on these two topics. Dr. McFarland has published over 150 peer-reviewed articles, co-authored and edited three books on Biotherapeutic Agents and Clinical uses.

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