The effects of probiotics on barrier function and mucosal pouch microbiota during maintenance treatment for severe pouchitis in patients with ulcerative colitis

Abstract

Background: A total of 10–15% of patients with an ileoanal pouch develop severe pouchitis necessitating long-term use of antibiotics or pouch excision. Probiotics reduce the risk of recurrence of pouchitis, but mechanisms behind these effects are not fully understood.

Aim: To examine mucosal barrier function in pouchitis, before and after probiotic supplementation and to assess composition of mucosal pouch microbiota.

Methods: Sixteen patients with severe pouchitis underwent endoscopy with biopsies of the pouch on three occasions: during active pouchitis; clinical remission by 4 weeks of antibiotics; after 8 weeks of subsequent probiotic supplementation (Ecologic 825, Winclove, Amsterdam, the Netherlands). Thirteen individuals with a healthy ileoanal pouch were sampled once as controls. Ussing chambers were used to assess transmucosal passage of Escherichia coli K12, permeability to horseradish peroxidase (HRP) and 51Cr-EDTA. Composition and diversity of the microbiota was analysed using Human Intestinal Tract Chip.

Results: Pouchitis Disease Activity Index (PDAI) was significantly improved after antibiotic and probiotic supplementation. Escherichia coli K12 passage during active pouchitis [3.7 (3.4–8.5); median (IQR)] was significantly higher than in controls [1.7 (1.0–2.4); P

Conclusions: Probiotics restored the mucosal barrier to E. coli and HRP in patients with pouchitis, a feasible factor in prevention of recurrence during maintenance treatment. Restored barrier function did not translate into significant changes in mucosal microbiota composition, but bacterial diversity correlated with barrier function.

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Authors: M. Persborn J. Gerritsen C. Wallon A. Carlsson L. M. A. Akkermans & J. D. Söderholm

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