Abstract

Background & aims: The pathogenesis of enteritis after abdominal radiotherapy is unknown, although changes in faecal microbiota may be involved. In several studies, Lactobacillus and Bifidobacterium have proven beneficial for the host. Prebiotics stimulate the proliferation of Lactobacillus and Bifidobacterium, and this may have positive effects on the intestinal mucosa during abdominal radiotherapy. Methods: We performed a randomised double-blind, placebo-controlled trial including 31 patients with gynaecological cancer who received radiotherapy (29 sessions, 52.2 Gy) after surgery. Patients were randomised to two groups: prebiotic and placebo. The first group received a mixture of fibre (50% inulin and 50% fructo-oligosaccharide) and the second received 6 g of maltodextrin twice daily from one week before to three weeks after radiotherapy. Lactobacillus and Bifidobacterium counts were determined in faeces samples (day –7 before radiotherapy, day 15 of radiotherapy, at the end of treatment, and three weeks after radiotherapy) by culture in selective media and fluorescent in situ hybridization (FISH) using genus-specific probes. Bacterial counts by FISH were significantly higher than by culture method. Results: There were no differences in baseline microbiota between groups. At the end of radiotherapy, we observed a statistically significant decrease in Lactobacillus and Bifidobacterium counts in both groups. By cultural analysis, we observed higher numbers of Lactobacillus and Bifidobacterium three weeks after radiotherapy in the prebiotic group (5.6 vs. 6.3, p = 0.04 and 5.5 vs. 6 log cfu/g, p = 0.03). Conclusions: Abdominal radiotherapy negatively affects Lactobacillus and Bifidobacterium counts. The prebiotic mixture of inulin and fructooligosaccharide can improve the recovery of both genera after radiotherapy. Registered under ClinicalTrials.gov Identifier no. NCT01549782.

Keywords

Prebiotics, Microbiota, Radiotherapy, Gynaecological cancer.