

# Pretreatment with antibiotics may enhance the efficacy of fecal microbiota transplantation in ulcerative colitis: a meta-analysis

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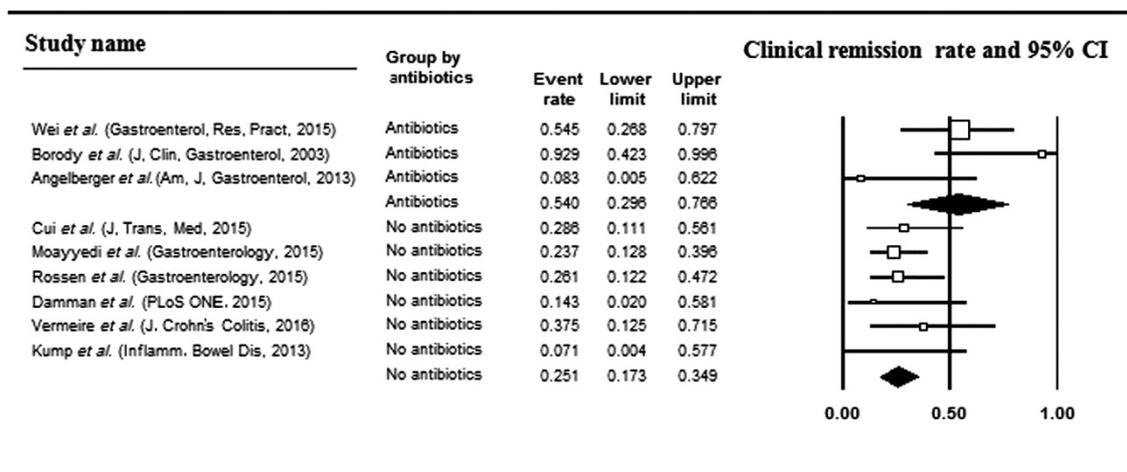
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**To the Editor:** We read with great interest Pigneur and Sokol's review article<sup>1</sup> about fecal microbiota transplantation (FMT) and its challenges in treating inflammatory bowel disease (IBD). As highlighted by the authors, one of the major factors that may optimize FMT for IBD is how the recipient's bowel is prepared prior to an FMT. Theoretically, using antibiotics has the potential to "make space for the new microbiota" before FMT by freeing previously occupied niches. Recently, Ishikawa *et al.*<sup>2</sup> showed that administration of amoxicillin, fosfomicin, and metronidazole for 2 weeks prior to FMT improved bacterial dysbiosis in ulcerative colitis (UC) patients through transplantation of Bacteroidetes from donors in comparison to no pretreatment prior to FMT.

In order to investigate how the administration of antibiotics before FMT affects the outcome (clinical remission) in adult UC patients, we performed a meta-analysis of previously published studies. Our search strategy was similar to the one used in Colman and Rubin's recent systematic review,<sup>3</sup> and we only

included studies that were performed on adult UC patients. Comprehensive Meta-analysis, V.3 (Biostat, Englewood, NJ, USA) was used for statistical analysis. Overall effect (clinical remission rate in UC) was derived from the random effect model using the DerSimonian and Laird method, which takes between-study variation into account. Between-subgroup heterogeneity (antibiotics vs. no-antibiotics pretreatment) was assessed using the fixed-effect model.

In total, nine studies (118 patients) were selected for this analysis. Two studies<sup>4,5</sup> were randomized controlled trials and we only included data from their FMT arms. The pooled remission rate following FMT in UC was 30.3% (95% confidence interval (CI) = 19.3–44.2%). As shown in **Figure 1**, the remission rate after FMT was significantly higher in studies that used antibiotics as the pretreatment procedure in comparison to those that did not use any antibiotics before FMT (54.0% vs. 25.1%,  $P = 0.03$ ). Limitations to this analysis include significant heterogeneity related to the administration route, the use of fresh or frozen stool, and number of treatments.



**Figure 1** Forest plot of studies that performed fecal microbiota transplant on ulcerative colitis patients comparing pretreatment with or without antibiotics before fecal microbiota transplantation. CI, confidence interval.

In conclusion, it appears that administration of antibiotic pretreatment before FMT may increase the rate of clinical remission in adult UC patients. To understand the underlying mechanisms by which antibiotic pretreatment can enhance the therapeutic efficacy of FMT and to determine the most appropriate antibiotic regimen, further well-designed randomized controlled trials are required. In addition, in that antibiotic therapy can induce remission in patients with active UC<sup>6</sup> independent of possible effects in enhancing the effectiveness of FMT, the design of future studies should

consider including a study arm with antibiotics alone.

### DISCLOSURE

The authors declared no conflict of interest.

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