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LETTER TO THE EDITOR

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Fecal microbiota transplantation in an elderly patient with mental depression

Fecal microbiota transplantation (FMT), in which intestinal microflora from a healthy person is transplanted into a patient's intestinal tract, has been used to reconstruct the intestinal microbial ecology and treat gastrointestinal disease. Here it was applied in a patient with a 6-month history of mental depression after a stressful event. Good results were achieved in this elderly woman, and she remains in remission after almost 12 months of follow-up. Our experience suggests that FMT could be a feasible treatment for mental depression.

Our patient was a 79-year-old woman. After her personal property was stolen, she experienced loss of appetite, constipation, introversion, and drowsiness and stayed in bed all day. During a 6-month period, she lost nearly 25 kg. She was admitted to a psychiatric department, diagnosed with mental depression, the Patient Health Questionnaire score (PHQ-9) was 21, and prescribed escitalopram, Flupentixol and Melitracen Tablets, gastrointestinal dynamics regulators, probiotics, and supplemental digestive enzymes for 6 months. However, no obvious improvement occurred. Seven months after disease onset, we transferred 200 mL of a bacterial solution to the descending duodenum via a gastroscope. The antidepressants were stopped thereafter. The donor was her 6-year-old great-grandson, who had a good appetite, an outgoing personality, and a disciplinary stool. Four days after the FMT, the patient felt less sleepy, her appetite had changed for the better, and she became more talkative. Two weeks after the therapy, she became euphoric. She was able to live independently, and her weight had increased by 1.5 kg. Six months later, her weight had returned to normal and the constipation symptoms had improved, PHQ-9 score descended to 4, meant a normal level.

The result of 16S ribosomal RNA sequencing showed that after the FMT, there was a significant increase in Firmicutes counts, while those of Bacteroidetes were significantly reduced. Much research (Ley *et al.*, 2006; Makarova and Koonin, 2007; Samuel and Gordon, 2006; Tumbaugh *et al.*, 2006) has indicated that Bacteroides and Firmicutes jointly promote host absorption or energy storage and that an increase or decrease of either may contribute to weight gain. The number of Lachnospiraceae species was quite low before the FMT but much higher thereafter. Lachnospiraceae species break down carbohydrates into short-chain fatty acids (SCFAs). The reduction of Lachnospiraceae would thereby result in the loss of SCFAs (Duncan *et al.*, 2007) and retard the colonic transmission speed. Thus, we speculated that Lachnospiraceae species may be less abundant in patients with gastrointestinal dysfunction. In addition, the reduction of SCFAs can reduce the intestinal production of 5-HT, an important neurotransmitter in the fight against depression.

Our findings indicated that FMT can optimize the intestinal microflora of patients with depression and relieve depression-related symptoms by restoring or reconstructing the constitution of the intestinal microflora. Studies on the treatment and mechanism of FMT in depression are presently lacking, so further explorations in large-sample randomized clinical trials are required to verify our findings.

Conflict of interest statement

None.

Description of authors' roles

Ting Cai performed the study, collected the data, drafted the manuscript; Xiao Shi collected the data and interpreted the manuscript; Ling-zhi Yuan performed the statistical analysis and revised the manuscript; Dan Tang performed the study; Fen Wang organized the study and revised the manuscript. All authors approved the final version of the manuscript.

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