

Fecal microbiota transplantation (FMT): application and future direction

Introduction

Fecal microbiota transplantation (FMT) classified as human tissue is obtained from healthy donors, with no risk association from transmissible diseases or change of cellular composition, mainly antibiotic use. FMT Also known as Fecal Bacteriotherapy, which is a procedure of stool transfer from a healthy human donor to a person suffering from gastrointestinal disorder via colonoscopy, enema, NGT or oral capsules (poop pills). Regardless of the route of administration, abundant of evidence supporting the fact that fecal microbiota transplantation is a highly effective and safe as a therapeutic option for Pseudo membranous colitis and Recurrent Clostridium difficile infection (RCDI) compared to antibiotics used or IVIG.

The body's ecosystem

To understand how FMT work, it is necessary to know the compositional complexity of the normal flora in human GI (ecosystem). There are about 10^{14} bacterial cells in our body, as many as they are 10 times more than human cells (10^{14} versus 10^{13}) and most of these bacterial cells reside in the GI tract. Only about one-third percent detectable through culture-based technique. The GI microbiota exists in balanced homeostasis with vital roles in nutritional status and immune system development.

FMT in the treatment of C difficile

Clostridium difficile infection (CDI) is the leading cause of infectious nosocomial diarrhea in developed countries, with an incidence of approximately five per 10,000 days of hospital stay in Europe. CDI is a major burden on patients and healthcare systems with a significant increase in morbidity and mortality. Annual costs for management of CDI almost cost \$800 million in the USA and €3000 million in Europe. Moreover, estimates suggest that costs recurrent Clostridium difficile infection (RCDI) can exceed those of primary CDI. As mentioned earlier FMT is a highly effective and safe as a therapeutic option showing a promising result in the treatment of C. difficile infection mainly relapsing CDI demonstrated vast superiority of FMT over traditional antibiotic therapy. FMT had a success rate 81% following a single nasoduodenal infusion and approximately 94 % following the second infusion in comparison to antibiotic therapy vancomycin with or without bowel lavage had only 23 %-31 % efficacy.

The future of FMT in the treatment of inflammatory bowel disease (IBD)

Chronic Inflammatory diseases of the gastrointestinal system have multifactorial etiologies. Even though the role of FMT in the management of IBD remains unclear. But in both Crohn's disease and

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Nawaf Rahi Alshammari

King Saud University, Saudi Arabia

Correspondence: Nawaf Rahi Alshammari MD, King Saud University, Saudi Arabia, Email dr.nawaf4all@hotmail.com

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ulcerative colitis trials of shifting the gut microbial composition in genetically susceptible individuals, may prove efficacious and provide an alternative and complementary approach to the management of IBD. Based on the evidence that transferring normal flora can rebalance the immune system which can be considered as a potential therapy for IBD. Overall, understanding of FMT efficacy in IBD is still in its infancy period need more research for proven and to avoid its limitations.

To understand the role of FMT in the management of other conditions is still in the investigational stage and required further study to disclose any therapeutic potential. FMT is proven as a highly effective and safe as the most effective therapy for Clostridium difficile infection and recurrent Clostridium difficile infection (RCDI).

As we achieve better understanding the role of the microbiome in the therapeutics field well, it can lead to change totally the fecal bacteriotherapy from a whole stool transplant to a precise individualized approach that uses specific microbial ecosystems with specific mixtures of the microbes from stool transplant required to reach specific therapeutic effects in specific diseases.

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Conflicts of interest

The authors do not have any conflicts of interest.