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Fecal Microbial Transplantation and Gastro Intestinal Diseases

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Editorial

Microbiota is "the ecological community of commensal, symbiotic and pathogenic micro organisms that literally share our body space". All of the bacteria that live inside the human gastrointestinal tract are referred to as the "microbiota". The intestinal microbiota consists of more than 1000 species. The healthy microbiota has many functions within the gut(mainly in thecolon) as protecting against pathogens, participating in the intake of dietary nutrients, metabolizing certain drugs and carcinogens, influencing the absorption and distribution of fat, synthesis of certain vitamins [1]. Imbalances in the composition of this microbiota can cause intestinal dysfunctions with dysbiosis and chronic disease states. The discovery of antibiotics in the early 20th century had an enormous impact on modern medicine, dramatically reduced mortality associated with infections. However, the emergence of drug – resistant pathogens has occurred due to greater availability and inappropriate use of antibiotics in healthcare and agriculture and has become a global health concern.

The microbiota of the human gut is a complex ecosystem with the potential to be an enormous reservoir of antibiotic resistance (ABR) genes, known as the 'gut resistome.'(Willem van Schalk et al. 2015) Antibiotic resistance may arise in a number of different ways, including the accumulation of point mutations and horizontal gene transfer from other bacterial populations to potentially pathogenic bacteria. (Braden Millan et al. 2016). The "keystone pathogen" hypothesis holds that certain low-abundance microbial pathogens can orchestrate inflammatory disease by remodeling a normally benign micro biota into a dysbiotic one. And the (Pathobiont theory)" some commensal species that does not normally elicit an inflammatory response but under particular conditions (typically environmentally induced) has the potential to cause dysregulated inflammation and lead to disease" [2].

The increase in the prevalence and incidence of antibiotic resistant bacteria now presents a severe challenge in the treatment of patients infected with these multidrug-resistant organisms... Following repeated courses of antibiotics, where the diversity of the gut microbiota is reduced, allowing the bacteria containing ABR genes to flourish. This allows for opportunistic pathogens such as Clostridium difficile to colonize and dominate the gut.

The long-term outcome of exogenous microbiota transplantation might be a breakthrough for the treatment of resistant pathogens as well other various chronic diseases. (Lederberg J et al. 2001) The potential to manipulate the micro biome, by application of FMT (feacal microbiome transplant) therapy, is now being extensively investigated. Although most of the reports to date, "being uncontrolled case reports and small case series. "The attitude towards this approach "feacal transplant "in medical societies were positive. And satisfactory (Jiang ZD et al. 2013), but there have been some concerns regarding safety and acceptability associated with FMT.

FMT approach has already been used for treating microbiome diseases such as *Clostridium difficile* associated pathologies, IBD and IBS.(Brandt LJ et al. 2012).The most impressive demonstration of efficacy comes from the first randomized controlled trial of FMT in CDI reported by (Nood et al.2013).In many aspects, FMT is simpler to perform than other organ transplants, without the need for immunological matching of donor and recipient or the need for immune suppression after the procedure.(Brandt L et al 2012).Most feacal donors have been healthy family members or spouses/significant partners who have common genetic and/or environmental factors.

Following fecal microbial transplantation, the diversity of the gut microbiota is increased and bacteria containing antibiotic

resistant genes are eradicated. (Millan B et al .2016). The potential applications for FMT could be in treating obesity, IBD and other conditions that may prove to be associated with altered microbiomes (dysbiosis and decrease in microbial diversity).Future advancement in delivery of FMT would be in the commercial use of a capsule form with desiccated microorganisms.Microorganisms could be tailored to a specific disease. (Koleilat et al 2016) How far can we go in this approach , future research will determin that.

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