

Is Fecal Transplant a Solution to our Civilized State of Health?

Aziz Koleilat*

Associate professor, Makased University General Hospital, IBR member, vice general secretary at Pan Arab society of Pediatric Gastroenterology, Hepatology and Nutrition, Beirut, Lebanon.

Corresponding Author: Aziz Koleilat, Makased University General Hospital, IBR member, vice general secretary at Pan Arab society of Pediatric Gastroenterology, Hepatology and Nutrition, Beirut, Lebanon, **Tel:** + 961 1 636 000; **Email:** drkoleilat@hotmail.com

Received Date: 06 Mar 2017

Accepted Date: 14 Mar 2017

Published Date: 15 Mar 2017

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Citation: Koleilat A. (2017). Is Fecal Transplant a Solution to our Civilized State of Health?. M J Gast. 2(1): 008.

INTRODUCTION

"I am not what happen to me, I am what I choose to become"
(Carl Gustav Jung) 1875.

With the start of the 21st century people all over the world became integrated with each other, in food, habits and communication, so changes reached the core of the human body. New diseases had erupted and diseases not known in certain societies became known and widely spread.

The 20th century was known as the century of antibiotics. The hygiene hypothesis was introduced [1] and other hypotheses were also suggested to explain the increase surge of certain diseases and abolishment of others. The hygiene hypothesis stated that early exposure to germs will cause the immune system to steer towards infection-fighting mode, and away from over-reacting to normally benign substances [1, 2].

The Microbiota hypothesis stated that the assumption that a modern/industrialized lifestyle leads to altered microbial diversity which affects the etiology of some diseases [3].

The Biodiversity hypothesis, which is extension of both the hygiene and microbiota hypothesis, provides a link between the two [4].

The Pathobiont theory stated that some potentially pathogenic bacteria that coexist in very low abundance with the commensal bacteria in a healthy individual, exhibit pathogenic properties, whenever there is dysbiosis, causing immune activation and inflammation [5].

All the above theories stress on the fact that composition of microbial flora has an effect on human body and development of diseases and health state.

With all these explanations we could not reach to a satisfactory and convincing complete explanation why our health, immunity, and quality of life are deteriorating.

So if we manipulate the microbial flora, can we make a difference in human health and diseases?

Here came the idea of fecal microbial transplant (FMT). Fecal microbial transplant came to the surface of therapy. History of FMT is long, but the first true fecal transport occurs while the fetus is normally vaginally delivered [6].

FMT, also known as a stool transplant, is the process of inoculation or transferring fecal bacteria from a healthy individual into a recipient. FMT entails restoration of the gut microflora by introducing healthy bacterial flora via stool infusion [7].

The gut microbiota consists of different functional microorganisms such as candidate probiotics and viable beneficial microorganisms. Probiotics have several effects including improving intestinal epithelial cell function, modulating cytokine secretion profiles, protecting against physiologic stress, affecting T-lymphocyte populations, and increasing antibody secretion. Probiotics have provided significant therapeutic options for various diseases through different mechanisms. Probiotics communicate with the host by modulating the main signaling pathways, such as nuclear factor kappa B (NFκB) and mitogen-activated protein kinase (MAPK) to enhance or suppress activation and affect downstream pathways.

Hence, beneficial microbes can greatly change the physiology of the gastrointestinal tract. Understanding their mechanisms of action could lead to new diagnostic and therapeutic methods [8].

DEFINITION OF TERMS

Biodiversity "The variability among living organisms from all sources, including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part this includes diversity within species, between species and of ecosystems" [9].

Commensal Part of the normal flora [10].

Dysbiosis Reduced diversity and disturbed composition of the microbial community [11].

Epigenetic changes Genome modifications, induced by environmental stimuli, which can be heritable, but are unrelated to DNA sequence changes [12].

Indigenous Within the person (commensal flora) [11].

Macrobiodiversity Living organisms of a region that are large enough to be seen with the naked (eye) [11].

Metagenomic Genetic material of a microbial community [13].

Microbiome The entire genetic material of micro-organisms within a given niche. Commonly refers to bacteria but can also include genomes of viruses, fungi and protozoans [11].

Microbiota The group of micro-organisms within a given niche [11].

Saprophyte A non-pathogenic environmental bacterium dependent on degrading plant material [11].

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