

Gut Microbiota (GM) Dysregulation during Pregnancy

Gowtham Malhothra*

Department of Applied Microbiology and Biotechnology, Yeungnam University, Gyeongsan, South Africa

DESCRIPTION

The bacteria in the human intestine constitute the Gut Microbiota (GM), which is a micro-ecosystem that causes the relationship between the GM and the host, which is crucial for the host's regular physiological processes. GM dysbiosis may result in a number of diseases. GM has been determined to affect human health and disease, as well as how an individual develops and gets sick. The physiological process of pregnancy is difficult causing significant changes in hormones, the immunological system, metabolism, and GM. Pregnant women's and offspring's health can be impacted by gastrointestinal conditions such as hepatitis, intrahepatic cholestasis of pregnancy, and pre-eclampsia. GI disorders are one of the conditions that can develop as a result of GM dysregulation during pregnancy. GM in pregnancy-related gastrointestinal diseases and GM interact with the host under physiologically normal conditions, gastrointestinal disorders, and pregnancy-specific disorders. The harmful mechanism of GM in gastrointestinal illnesses during pregnancy will be further evaluated in order to provide a theoretical basis for the use of probiotics to treat these diseases as reproductive health obtains more attention. A micro ecosystem known as the human Gut Microbiota (GM) is frequently referred to as a person's "virtual organ." This ecosystem is inhabited to more than 10¹⁴ microorganisms, including more than 1000 species. More than one hundred times larger than the human genome and genomes of bacteria, also known as the microbiome. After birth, the microbiota colonises the gut and persists for the duration of the host's life. The composition of GM is not stable; however, it varies with age, environment, physiological state, and pathological state. The GM composition directly impacts throughout pregnancy, which is a physiological state. The immune system, metabolism, and diet all undergo significant alteration and are involved in GM. Numerous illnesses can be brought on during pregnancy by the dysbiosis of GM. GM affects pregnancy and disease, particularly Gastro-Intestinal (GI) disorders that can occur during pregnancy.

Gut microbiota in human physiology

The metabolism of humans is affected by GM. Fermentation of

inedible food ingredients is one method that the GM helps the host. Complex carbohydrates are difficult for human enzymes to digest, but some dominant species in the colon, such as Bacteroidetes, have many active enzymes that can break down complex carbs to provide energy and/or beneficial compounds for the host. The host can use the by-products of complex carbohydrate fermentation, such as Short-Chain Fatty Acids (SCFAs), as a source of energy. Additionally, some SCFAs have an anti-inflammatory effect. Protection of the intestinal barrier, some vitamins, such as the K and B vitamins, can be produced by the GM and are essential in a variety of host pathways. The intestinal barrier, which can effectively protect the host's immune system from bacterial products, is made up of a monolayer of epithelial cells and a layer of mucus. The mucus layer's functionality can be improved by the metabolites produced by gut bacteria. For example, the ketone bodies which bacteria generate must enhance the amount of mucus that goblet cells secrete; and Immunity regulation. The GM can influence invariant T cells, T cell composition, and lymphoid structure development. With the ability to activate G-Protein Coupled Receptors (GPCRs) and enhance the amounts of enzymes and transcription factors involved in the immunity given by intestinal epithelial cells and the formation of leukocytes, SCFAs play a key role in the interaction between GM and immunity.

CONCLUSION

The physiological activities of the intestines are regulated in large portion by the gut bacteria. A number of intestinal disorders can arise as a result of microbial dysbiosis. During pregnancy, the gut microbiota undergoes significant change. To the functional characterization of the gut microbiota and the mechanism underlying the correlation between GM and pregnancy-specific gastrointestinal diseases, the dysbiosis of microbiota in pregnant women is related to a variety of diseases in pregnancy, including pregnancy-specific gastrointestinal diseases like PE, ICP, HG, and constipation during pregnancy. Promising therapeutic approaches are provided by efficient probiotics with few side effects.

Correspondence to: Gowtham Malhothra, Department of Applied Microbiology and Biotechnology, Yeungnam University, Gyeongsan, South Africa, E-mail: Malhothrag@gmail.com

Received: 29-Nov-2022, Manuscript No. JPH-22-21112; **Editor assigned:** 01-Dec-2022, Pre QC No. JPH-22-21112 (PQ); **Reviewed:** 15-Dec-2022, QC No. JPH-22-21112; **Revised:** 22-Dec-2022, Manuscript No. JPH-22-21112 (R); **Published:** 29-Dec-2022, DOI:10.35248/2329-8901.22.10.307.

Citation: Malhothra G (2022) Gut Microbiota (GM) Dysregulation during Pregnancy. J Prob Health.10:307.

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