The Role of Hypothalamic Pituitary Adrenal (HPA) Axis on the Gut Microbiome and Behavior

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Abstract

The gut-brain axis; The trails of communication between the microbiota and brain are step by step being unraveled, and include the Vagus nerve, gut hormone signaling, the immune system, tryptophan metabolism, and microbial metabolites such as short chain fatty acids. Fluctuations or alterations of the early microbial composition by way of antibiotic exposure, lack of breastfeeding, birth by Caesarean section, infection, stress exposure, and other environmental influences - coupled with the influence of host genetics - can result in long-term modulation of stress-related physiology and behavior. The gut microbiota has been implicated in a different stress related conditions including anxiety, depression and irritable bowel syndrome (IBS), however, this is largely based on animal studies or correlative analysis in patient populations. [15]
In this review I used Scopus and Pubmed as the sources, then I insert the keywords Brain, gut, stress, bidirectional and human. In this survey I attempted to concentrate more on endocrinal aspect, therefore, 15 articles got candidate from 38 articles which was the total number. The reason for this choice is the recent progress in this field particular which has attracted the attentions to the psychosomatic disease that is becoming inevitably common in modern societies.

Keywords: Brain, gut, stress, bidirectional, endocrine

Image

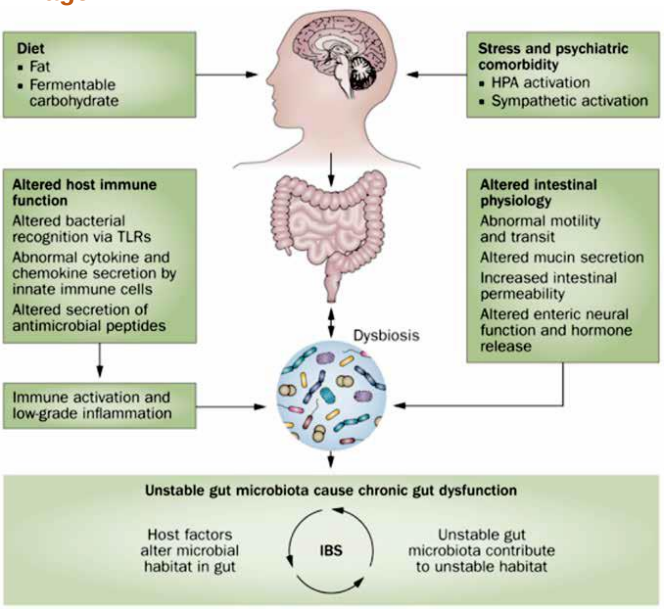


Figure 2: The relationship between dysbiosis and irritable bowel syndrome (IBS).

Recent Publications (minimum 5)

1. Bernstein, C. N. (2017). The Brain-Gut Axis and Stress in Inflammatory Bowel Disease. *Gastroenterology Clinics*, *46*(4), 839-846.
2. Rosenblat, J. D., & McIntyre, R. S. (2017). Bipolar Disorder and Immune Dysfunction: Epidemiological Findings, Proposed Pathophysiology and Clinical Implications. *Brain sciences*, *7*(11), 144.
3. Allen, A. P., Dinan, T. G., Clarke, G., & Cryan, J. F. (2017). A psychology of the human brain–gut–microbiome axis. *Social and personality psychology compass*, *11*(4).
4. Martin, Clair R., and Emeran A. Mayer. "Gut-brain axis and behavior." *Intestinal Microbiome: Functional Aspects in Health and Disease*. Vol. 88. Karger Publishers, 2017. 45-54.
5. Davis, D. J., Doerr, H. M., Grzelak, A. K., Busi, S. B., Jasarevic, E., Ericsson, A. C., & Bryda, E. C. (2016). Lactobacillus plantarum attenuates anxiety-related behavior and protects against stress-induced dysbiosis in adult zebrafish. *Scientific reports*, *6*, 33726.



Biography

Yasin Ahmadi has completed his master in Clinical Psychology at University of Bergamo, Italy. He has experienced research training at The New School and New York University and also supervised by Dr. Francesca Morganti

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