



Original Contribution

DYSBIOSIS OR HOW IT CAN RUIN YOUR LIFE THROUGH THE NERVOUS SYSTEM

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ABSTRACT

Ever since probiotics have become a modern topic to discuss in the last few decades, they came out as the most important and independent regulatory system of our metabolism. ``We are what we eat`` or the way of how food modeling us. And it is not about exactly the food but the probiotics in it. In 2012 our team published an article about the connection of probiotics and glucose metabolism (1). At the same time, the whole scientific world worked on different relationships between the gut microbiome and body functions. For literally few years ago, there is a massive progress of knowing the fine mechanisms and importance on this condition – the symbiosis with ``the good`` bacteria. If we think about the reason why it is so popular today and why so many researchers work on it, we only can point out the modern lifestyle and the bad quality of food accompanied it. The relationship between those two is the busy lifestyle and the necessary to eat the canned meal fulfilled of preservatives and poor of microbiome, combined with often antibiotic uses which destroyed your balance in long-term plan. Those states of continuing do`s eventually can ruin your life through the nervous system. We can conclude that the misdiagnose of dysbiosis is the 21st century challenge.

Key words: Gut microbiome, Intestinal nervous system, Gut brain, Nutrition

INTRODUCTION

The connection between dysbalanced gut microbiome and variables of gastrointestinal diseases and other`s system diseases is a topic which more often is on the light spot. Very much new research technics and studies allows us to understood better the ethiopathogenesis of some disorders starting with gut microbiome changes. The old school presents the gut like peripheral organ but in the last few decades thanks to all the studies is claimed that enteral nervous system exists and it is, the second brain”. This system has an important role to local and multi systemic processes (2). The intestinal neuron network interacts with the central nervous system creating the axis gut-brain. It allows one part to impact on the other

and the opposite, supporting the balance (2). In this study, we are trying to resolve affected life aspects, using all the data through the years and organizing current information about the topic (**Figure 1**).

NERVOUS SYSTEM AND MICROBIOME

The latest literature data show that the gut microbiome expands its power not only over the tract but also over the central nervous system, playing an important role in its function. Because of that nowadays there is a concept for axis microbiome-gut-brain like a single working system and regulating other different physiological processes. This axis is bidirectional and interacts with the animal nervous system, hypothalamo-hypophysis-suprarenal axis and with the immune system (3). The animal nervous system has an integral role and modulates gut homeostasis, providing the motility, permeability, secretion, etc.

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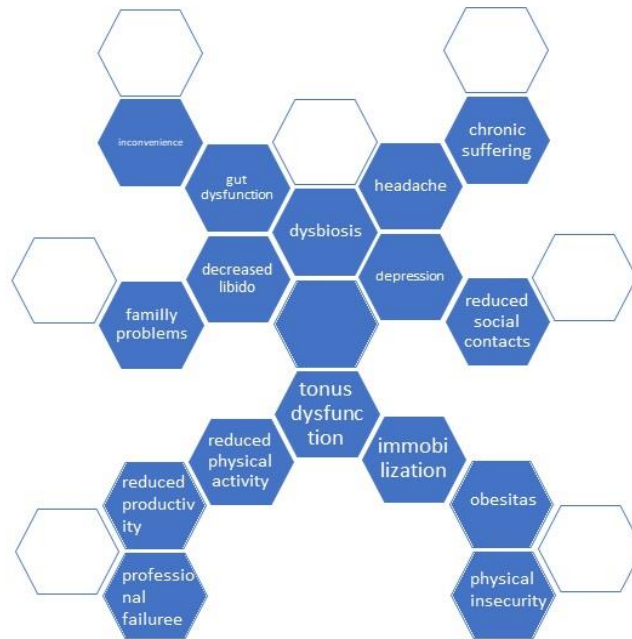


Figure 1. Life aspects, affecting by dysbiosis

The gut microbiome can be described as the superorganism, constantly changing through all of our lives forming one of the most colonized commensal ecosystems. The components are regulated by inner and outer factors. This process is influenced by genetics, food and ecological factors (4). The most observed and power factor is the personal diet. Those results are proved and by epidemiological studies over the decreased cognitive functions. Short chain

fatty acids are important bacterial metabolites, decreasing inflammation and increasing neuroplasticity (4) but diet rich in fructose is related to acute inflammation in hippocampus. This is the reason for favorable effect of ketogenic diet over the refractory epilepsy (2, 5). The mechanism is increasing the *Akkermansia Muciniphila* and *Parabacteroides* who produced GAMK for hippocampus (6), (Figure 2).

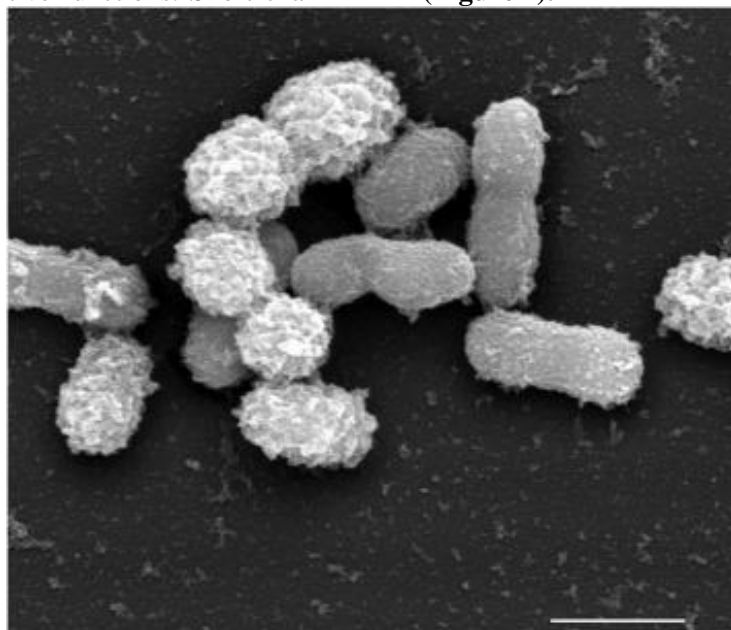


Figure 2. Scanning electronic micrograph of *Akkermansia muciniphila* (7)

INCONVENIENCE AND MICROBIOME.

Dysbiosis cause local inflammation as a gut dysfunction. This unlocks the alternative pathways to digesting the food and generating the gases and bloat with increasing the physiological peristalsis. This condition can be temporary related to daily diet but continuing the same type of diet turns it in to a chronic state which eventually brings the inconvenience.

FAMILY PROBLEMS AND MICROBIOME.

It is not reported that dysbiosis leads to decreasing the libido which soon corresponds to family problems. But we suggest that there is a connection because of the model that we build and this can be the new perspective for researchers.

PROFESSIONAL FAILURE AND MICROBIOME.

The state of chronic inflammation exhausting the organism and especially the brain who suffering from lower level of short chain fatty acids. For example the diet fibers are digestive by the commensal bacteria in gut and they produce short chain fatty acid, suitable for the brain (4). That may be at the base of tonus dysfunction. Ones the tonus is low, and then the physical activity is reduced. Therefore the productivity is also reduced, so it causing professional failures during the dysbiosis period of time.

PHYSICAL INSECURITY AND MICROBIOME is caused by reduced physical activity or immobilization combined with higher levels of sugar, metabolic syndrome and obvious obesity. Those factors form vicious circle finally presenting by physical insecurity and mental health disorders. It is proven the unfavorable effect of simple sugar over the colony and some disorders therefore (4). The Mediterranean diet is connected to longevity increasing the proportion of *Prevotella* and *Firmicutes* promoting the cardiovascular diseases and metabolic syndrome (4).

REDUCED SOCIAL CONTACTS AND MICROBIOME are the final present of mental health disorders and depression, connected to dysbiosis (8-10).

CHRONIC SUFFERING AND MICROBIOME.

Chronic brain suffering and exhausting the body are accompanied by the symptom

headache. The chronic headache is one of the most suffer-causing symptoms (11).

There are many more neurological manifestations of dysbiosis like memory loss and all of them affecting a different life aspect during the time. If the condition continues enough that hits the personal life at all cardinally. We need to incorporate them in syndrome and get the treatment for the reason but not for singular life aspect with useless medications. Probably there are other undiscovered branches of the pathogenesis in each life aspect but it's not necessary because we just can repair the main problem namely diet. Nowadays the nutrition is developed and allows it. The people are fascinating by the nutrition but the quality of food at the marketing is still difficult to responds to the public expectations and needs for promoting health.

DISCUSSION

The permeability, motility and secretion are important factors for various physiological processes and they regulate the metabolism of neurotransmitters and substances with key role in human body. The influence over them has gut microbiome and central nervous system. The gut microbiome produces metabolites leading to production of neurotransmitters and some hormones as ghrelin and leptin. The unfavorable change in gut composition can destabilizes permeability by local inflammation and it can cause the blood-brain barrier changes connected to dysfunctions and disorders. Too many factors can lead to unfavorable change in composition of gut microbiome, named dysbiosis. Important role has antibiotics use, infections, diet, chronic disorders, alcoholism, etc. Dysbiosis have key role in remote organs and systems catalyzing autoimmune processes and allergic. Otherwise we can't treat the results individually one by one aspect of life. We need a cardinal resolution using the treatment of the core, incorporating and causing all the affection of different life aspects.

CONCLUSIONS

Commensal microbiome is constantly inflammation stimulus, controlled by immune response of host. The gut immune system must to be fine set up to supports protective functions in the presence of bacteria (4).

The general factor that can unbalances or rebalances this status is the diet.

The misdiagnose of dysbiosis is the 21st century challenge. We need to treat the diet to avoid affecting life aspects.

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