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LETTER TO THE EDITOR

Gastrointestinal microbiome and cholelithiasis: Prospect in the nervous system

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Abstract

Dan and colleagues recently published research suggesting that the gastrointestinal microbiome (microorganisms and metabolites) in cholelithiasis. They reviewed gallbladder stones, choledocholithiasis, and asymptomatic gallstones. Finally, their discussion was on the gastrointestinal. We focused on complementing the effect of the S1 protein and neuroinflammatory changes caused by severe acute respiratory syndrome coronavirus 2. Our contribution was about to involve the microbiota and the nervous system. They can have similar functions because they have similar pathways and advantages, bearing in mind γ-aminobutyric acid in schizophrenia and serotonin in Parkinson's disease. Therefore in the next few years, more research should be encouraged on the microbiota consequences for development, and mobility.

Key Words: Gastrointestinal microbiome; γ-aminobutyric acid; Serotonin; Letter

Core Tip: The microbiota and the nervous system can have similar functions because they have similar advantages. Bearing in mindγ-aminobutyric acid (GABA) in schizophrenia and serotonin in Parkinson's disease and GABA and serotonin management, we expect in the next few years, more research should be encouraged on the microbiota consequences for development, and mobility.

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TO THE EDITOR

Dan and colleagues recently published research suggesting that the gastrointestinal microbiome (microorganisms and metabolites) in cholelithiasis. They reviewed gallbladder stones, choledocholithiasis, and asymptomatic gallstones. Finally, their discussion was on the gastrointestinal microbiome changes and influences on cholelithogenesis[1]. This letter focuses on complementing the effect of the S1 protein and neuroinflammatory changes caused by severe acute respiratory syndrome coronavirus 2.

In the article by Garza-Velasco *et al*[2] molecular techniques were used for sequence and nucleic acids. The polymerase chain reaction in real time provided information on the importance of the microbiota in the proper functioning of the human body, *i.e.* the treatment programs associated with the administration of antibiotics affect the normal microbiota. This treatment causes the loss of sensitive members to the antimicrobial agent. Therefore, this can open the door for pathogens, which sometimes face serious competition for nutrients and oxygen. Also, both the microbiota and the nervous system may have similar functions because they have similar advantages. They argued that the microbiota may be important for the development, mobility, learning, and memory of the human brain by influencing different neurotransmitters such as serotonin and acid γ-aminobutyric acid (GABA), certain amounts of serotonin are also produced by bacteria such as Clostridium sporogenes and Ruminococcus. In addition, the microbiota synthesizes vitamins that contribute to the formation of important compounds in the metabolism of intestinal cells, including vitamin B and niacin, which are necessary for the tissues to produce Nicotinamide Adenine Dinucleotide. On the other hand, a significant part of the primary barrier prevents the free colonization of pathogens, regulates the proliferation of pathogens, and the productivity of antimicrobial agents that harm other species and/or different clones of the same species. Research on Escherichia coli colicins, with variants of the same species causing diarrhea. The protection of the intestinal microbiota also includes SCFA, for example, the acetate synthesized by Bifidobacterium longum prevents the development of Pseudomonas aeruginosa. Therefore together with propionate and butyrate, it prevents the growth of EHEC O157 and Proteus mirabilis[2]. Bearing in mind other studies with neurotransmitters involved in brain impairments GABA and serotonin. For example in the brain GABA in schizophrenic patients (modeling in brain areas by Ferrarelli and Tononi[3]; auditory cognitive properties by Mugruza-Vassallo and Potter[4]) as well as the linear association reported for the greater serotonin the lower nigral iron in Parkinson's disease patients (Jellen *et al*[5]).

Moreover, Swidsinki and Loening-Baucke[6] have shown that intestinal bacterial monocultures are resistant. They can avoid the host's immunological responses that are persistent in harsh environments and have a coordinated response to environmental stressors. The intestine is never completely sterile, and the host never has complete control over bacterial growth. The appearance, composition, and organization of the gut microbiota in each gut segment depended on whether inhibition or segregation predominates. In areas of the intestine where the microbiota was suppressed, the bacteria were sporadically present with variable composition and low concentrations. Complete separation of bacteria from the mucosa and low levels of inhibition leads to the formation of intestinal reservoirs where bacteria can grow and reach high concentrations[3]. Intestinal reservoirs where bacteria can grow and accumulate in high concentrations are formed as a result of complete separation of bacteria from the mucosa and low levels of inhibition[3]. These bacteria are native to these regions of the intestine as well as for development and mobility.

Our contribution to the types of microbiome, the locations and how the microbiome affects or favors humans. Above all, the microbiota and the nervous system can have similar functions because they have similar advantages and pathways, bearing in mind GABA in schizophrenia and serotonin in Parkinson's disease. Therefore in the next few years, more research should be encouraged on the microbiota consequences for development, and mobility.

Our objective in this work was to make a contribution to the types of microbiome, the locations and how the microbiome affects or favors us. Above all, the microbiota and the nervous system can have similar functions because they have similar advantages, it is argued that the microbiota can be important for development and mobility. All authors are in complete agreement with the information stated. The content of this manuscript is our original work and has not been published, in whole or in part, before or simultaneously with this submission.

FOOTNOTES

Author contributions: Lopez Tufino LDM drafted a study on gastrointestinal microbiome and cholelithiasis, reviewed literature, and wrote an initial version of the paper; Mancha Chahuara M drafted study on gastrointestinal microbiome and cholelithiasis, reviewed literature, and wrote initial version of the paper; Mugruza-Vassallo CA reviewed and criticized gastrointestinal microbiome and cholelithiasis, he added the prospect in the nervous systems and corrected the paper.

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