Bi-directional Relationship between Gut Microbiota and Anxiety

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An estimated 31% of adults in the U.S have suffered from anxiety in their lifetime. Anxiety is a mental health condition that affects people in many ways, and can be a precursor of health conditions like depression. The focus of this literature review is to analyze the function of different gut microbiota and their effects on anxiety. Recent evidence indicates D-alanine, an amino acid found in bacterial cell walls within the intestinal microbiome, influences how an individual reacts to negative emotions. Therefore, this review seeks to uncover the specific relationship between gut microbiota and anxiety through looking at how specific types of bacteria affect anxiety levels. Recent studies have shown that total lack of a gut microbiota in mice resulted in higher levels of a neurotransmitter called serotonin (5HT) in the gastrointestinal tract from the microbiota in the gastrointestinal system. Furthermore, an excess amount of serotonin in the nervous system can cause stress related symptoms such as irritability and restlessness. In addition, findings demonstrate that adults with irritable bowel syndrome (IBS) have higher anxiety levels suggesting that the brain-gut pathway is bi-directional. Despite knowing that gut dysfunction like IBA and total lack of gut microbiota can lead to increased anxiety, it remains unclear how the gut microbiota's neurotransmitters communicate with the brain to impact anxiety. Future research should focus on uncovering the mechanisms of this brain to gut connection.