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Letter to Editor

Could postbiotics improve mental health?

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Could postbiotics improve mental health?

The gut microbiota has emerged as a crucial component in the bidirectional communication between the gut and the brain, known as the gut-brain axis.[1-3] This complex network of interactions has been implicated in various mental disorders, including depression, anxiety, and schizophrenia. Recent literature suggests that an imbalance in gut microbiota, or dysbiosis, may contribute to the pathogenesis of these mental disorders by altering neurotransmitter levels, immune responses, and neuroinflammation.[4]

Mental disorders significantly impact individuals and society, leading to disability and reduced quality of life. While current treatments, including medications and psychotherapy, are effective for many, they may not be universally successful and can have undesirable side effects. This highlights the need for alternative approaches to prevent and treatment for mental disorders. Additionally, recent research indicates a direct link between gut health and mental health, with probiotics—live microorganisms known for their potential role in mental health—being less impactful than their metabolic by-products, termed postbiotics.[5]

Postbiotics, which include compounds like neurotransmitters, have shown promise in reducing inflammation and promoting intestinal health.[6-8] Consuming probiotics through fermented foods or supplements and indirectly consuming postbiotics through probiotic-rich foods or fortified products may improve mental health outcomes. This letter focuses on the potential benefits of postbiotics in preventing and treating mental illnesses such as depression, anxiety, bipolar and related disorders, and Psychotic disorders, aiming to explore new approaches for improving mental health.

Genetic variations and neurotransmitter imbalances contribute to depression and anxiety, which are prevalent mental health problems affecting millions globally.[9] The World Health Organization reports that approximately 280 million people suffer from depression, with women being more likely to experience it than men.[10] Various factors, including family history, stressful life events, and hormonal changes, contribute to the development of depression and anxiety. Conversely, the gut microbiota plays a significant role in the gut-brain axis, influencing stress responses and mental health.[11] Studies have also shown differences in the fecal microbiota of individuals with depression compared to healthy controls, suggesting a potential role for gut bacteria in modulating mental health.[10]

Moreover, psychotic disorders may be affected by gut microbiota. Probiotic supplementation may influence gut microbiota, reduce inflammation, and modulate immune responses, potentially benefiting patients with schizophrenia by increasing brain-derived neurotrophic factor levels and supporting cognitive function. Clinical trials have explored the effects of probiotics on cognitive impairment in schizophrenia, showing positive effects on symptom severity.[12,13]

Furthermore, manic illnesses, characterized by elevated mood and energy, can lead to impulsive behavior. Studies suggest that diet and microbiota can influence manic-like behaviors. Probiotic strains have shown potential in reducing mania-like behaviors and improving mood

in animal models. Additionally, postbiotics have demonstrated benefits similar to probiotics, indicating their potential role in managing manic disorders.[14,15]

The mechanisms by which probiotics and postbiotics influence mood are not yet fully understood. They may operate through the gut-brain axis, modulating gut microbiota composition and affecting neurotransmitter production. Probiotics can increase the production of GABA, a neurotransmitter with calming effects, and reduce markers of inflammation linked to mood disorders.[16,17] Microbial metabolites, such as short-chain fatty acids (SCFAs), GABA, dopamine, serotonin, tryptophan, and oxytocin, play significant roles in mood regulation. SCFAs, produced during the fermentation of dietary fibers, can act as signaling molecules that influence mood-related pathways. GABA is crucial for decreasing neuronal excitability, while dopamine and serotonin are associated with feelings of pleasure and happiness. Tryptophan, an essential amino acid, is a precursor for serotonin synthesis and has been linked to mood regulation.[18-23]

In conclusion, understanding the intricate relationship between gut microbiota and mental health status opens new avenues for therapeutic interventions targeting the gut-brain axis. Continued research into postbiotics and their effects on mood management and preventing and treatment of psychotic disorders could lead to novel approaches in psychiatry for treating individuals struggling with mental disorders, ultimately improving mental health outcomes and quality of life.

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Competing Interests

The authors have no conflicts of interest to declare.

Ethical Approval

Not applicable.

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