

Psychobiotics: The Latest Psychotropics

Sir,

Psychobiotics are the most recent of those agents with hypothesized psychotropic properties. Dinan *et al.* define psychobiotics as those living organisms that on sufficient ingestion produces a health benefit in those patients with psychiatric illnesses.^[1] This includes *Bifidobacterium infantis*, *Escherichia*, *Bacillus*, *Saccharomyces*, *Candida*, *Streptococcus*, *Enterococcus* and *Lactobacillus acidophilus* that can produce neurotransmitters including serotonin, norepinephrine and gamma-aminobutyric acid or modulate expression of neurochemical receptors like endocannabinoid receptors which act on the postulated brain-gut axis to produce psychotropic effects such as antidepressant and anxiolytic effects.^[2]

Though multiple studies have demonstrated favorable effects of psychobiotics in animal models of depression and chronic stress syndromes, clinical studies have been scarcer. In a study on clinical subjects with irritable bowel syndrome, *Bacillus infantis* was demonstrated as effective and an alteration in pro-inflammatory to anti-inflammatory cytokine ratio has been proposed as a possible mechanism of the psychobiotic agents, *Bacillus infantis*.^[3] Similarly, *Lactobacillus casei* was shown to have beneficial effects in human subjects with chronic fatigue syndrome when compared to placebo by reducing the anxiety scores.^[4] In another study, daily administration of probiotic agents reduced symptoms of psychological distress in normal healthy volunteers as measured by the Hospital Anxiety and Depression Scale and coping checklist. A concomitant decrease in urinary free cortisol further lends credence to the above observation.^[5] To summarize, psychotropic effects of most of the probiotic strains can be explained under the broad tenets of psychoneuroimmunology.

Furthermore, development and application of psychobiotic agents might be easier than conventional psychotropic medication, given that they are might not be required to undergo the stringent and rigorous regulatory procedures as those used for regular psychotropic drugs.^[6] Elaborate studies on those

Microbiota involved in depression, anxiety disorders and other stress-related disorders needs to be undertaken earnestly. The effects of such *Microbiota* or probiotic agents on one's behavior, cognition and emotive processes along with possible mediators of their action can further clarify the picture.

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