Health Benefits of Saccharomyces boulardii as a Probiotic

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Health Benefits of Saccharomyces boulardii as a probiotic
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Background

Saccharomyces boulardii (SB), a budding yeast, within the Saccharomyces genus. It commonly used as a probiotic that has been isolated from lychee and mangosteen fruit. S. boulardii is not known to acquire resistant genes and does not last in the intestine after 3-5 days of discontinuing the ingestion. The clinical efficacy of this probiotic yeast is known to improve various diarrhea such as pediatric diarrhea, antibiotic-associated diarrhea, acute diarrhea, and traveler’s diarrhea. Additionally, when used as an adjunct to treatment for Helicobacter pylori and Clostridium difficile infections, it improves bacterial eradication, prevents relapse, reduces adverse reactions and treatment-associated diarrhea.

Several animal studies have shown that Saccharomyces boulardii can alleviate certain psychological and behavioral conditions through the brain-gut axis and modulate gut microbiome composition. There is bidirectional communication between the brain and gut which is carried out by various pathways like neuronal, endocrine, metabolic and immune. Alterations to composition and function of the microbiota are related to many stress-related psychiatric disorders. This is evident in Irritable bowel syndrome (IBS), a gut-brain axis disorder that shares high levels of psychiatric comorbidities including anxiety and depression. The mechanism of how this happens is still unclear; however many studies support the view that the gut brain axis is key link between certain gastrointestinal and psychiatric disorders. Individually these disorders also share similar pathophysiology for example changes in monoamine gastrointestinal and psychiatric disorders. Individually these disorders

Methods

Records identified: Databases (n = 1) Registers (n =0) Search Strings (n=3) Records removed before screening: Duplicate records removed Removed marked as ineligible by automation tools Records removed for other reasons (n =0)

Results

Memory

- Significant reduction in fear conditioning and improvement of spatial memory and recognition memory in mice experiment and hippocampus induced cognitive impairments (14, 15)
- Increased pulse rate under stress reflects enhance sympathetic activity
- Significant impact on cytokine release mitigation by the β-6, IL-6, and cluster of differentiation 16 (CD16) expression
- Reduced anxiety and improved the anxiety-related behavior in the open field test, which was altered through the impact of animal health issues and untreated depression
- Improved spatial memory cognition deficits in rats

Cognitive Function

- Reduced anxiety and improved the anxiety-related behavior experienced by rats with hippocampus induced cognitive impairments

Antidepressant effects

- Saccharomyces boulardii treatment significantly improved the depression-like behavior experienced by rats with hippocampus induced cognitive impairments

Obsessive Compulsive Disorder

- Successful reduction of OCD and self-injurious behavior

Stress adaptation

- S. boulardii treatment in rat induced anxiety-like behavior by reducing stress and corticosterone levels and mitigating the lateral effects of LPS on serum serotonin and increased neurotrophic factor (BDNF) (18)
- Daily administration of S. boulardii strains (SB) induced significant reduction in anxiety, hyperactivity and depressive behaviors in rats with a significant increase in hippocampus size and reduced anxiety (17)
- Reduction in stress levels and improved sleep quality

Anxiety alleviation

- S. boulardii treatment in rat induced anxiety-like behavior by reducing stress and corticosterone levels and mitigating the lateral effects of LPS on serum serotonin and increased neurotrophic factor (BDNF) (18)
- Daily administration of S. boulardii strains (SB) induced significant reduction in anxiety, hyperactivity and depressive behaviors in rats with a significant increase in hippocampus size and reduced anxiety (17)
- Reduction in stress levels and improved sleep quality

Sleep

- Sleep behavior is improved in comparison to control group

Immune effects

- Regulates gut microbiota structure, attenuates the motility of gut microflora and reduces the risk of gut microbiota imbalance
- Prevents the development of the immune system and increases vaccine efficacy during early infancy period, which can alleviate the damage of ensuing stress

Antioxidant Effects

- S. boulardii grown in media mimicking gut environment contained more phenolic compounds with potential antioxidant properties

Discussion

Benefits of Saccharomyces boulardii:
- Helps with memory dysfunction
- Protects hippocampal damage in dysbiosis
- Inhibits microglial
- Improves depression like behaviors in rats
- Reduces OCD self-injurious behaviors
- Quicker return to baseline stress levels
- Improvement in anxiety
- Increased sleep quality
- Helps regulate the gut microbiome
- Produces compounds with potential antioxidant properties

Saccharomyces boulardii has potential positive effects on many different behavioral issues and different organ systems. These effects show that SB can be beneficial as an adjunct or even a treatment for many symptoms seen in a myriad of different disease processes.

Conclusion

Saccharomyces boulardii has been shown to have many potential benefits as a probiotic organism. This fungal species can survive and make it to the lower GI tract of humans when compared to other yeasts allowing it to be a suitable member of the human microbiome. Studies shown and represented here have shown that S. boulardii may play a role in neuromodulation, especially in those that have gut dysbiosis. This yeast may also play a role in modulating behaviors in those with OCD, and in modulating the stress response as well as anxiety alleviation and even in sleep and recovery in athletes. The results of these studies show that there is still much to learn about S. boulardii’s role in the human microbiome and its effects on overall human health. The outcomes of these studies show that the human microbiome and the fungi, bacteria, and other organisms that make it up may be something that should be considered when examining the overall health of patients. If more can be understood about the impact that members of the human microbiome have on the overall health of their patients, using probiotics such S. boulardii may one day be utilized as potential treatments or addition to treatments for a myriad of illnesses with a low potential for adverse outcomes.

Limitations/Future Directions

The limitation of this study is that the subjects of most of the studies are animal based, therefore it is vital to research the potentiality of the S. boulardii treatment on human subjects.

Future studies would be directed towards testing proposed potential benefits of Saccharomyces Boulardii in human subjects.

Reference

Figure 1: Methodology for inclusion of articles. Articles were found using PubMed and were analyzed for relevance towards behavioral health. Reason 1 exclusion criteria: Article not directly relevant to behavioral health