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Mechanisms of action and validity of probiotics for treatment of IBS

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Introduction

Irritable bowel syndrome (IBS) is a common chronic gastrointestinal tract disorder.

IBS is characterized by abdominal pain or discomfort, diarrhea, constipation, bloating, and distension in absence of identifiable biochemical or structural abnormalities.

IBS has a prevalence of 12-20% of the adult population worldwide and more common in women. [i]

Pathophysiology may be multifactorial, which is attributed to alterations in gastrointestinal motility, visceral hypersensitivity, intestinal microbiota, gut epithelium and immune function, dysfunction of brain-gut axis or certain psychosocial factors.

Recent research has revealed a potential role for the microbiota and the host immune response in IBS.

Probiotics are live microorganisms that have the capacity to prevent or treat specific pathological conditions when administered in adequate amounts.

Probiotics has been investigated as a promising treatment for IBS, and have demonstrated beneficial effects in some patients. [2]

Materials and Methods

Scientific literature search on PubMed database: Reviews and recent papers about probiotics and IBS (search terms: “IBS”, “treatment”, “IBS + Probiotics”). This info was selected according to their relevance and date.

Probiotics

For being effective probiotics need five conditions:

- (1) It must not be toxic or pathogenic
- (2) It must have a proven beneficial effect
- (3) It must contain a sufficiently large number of viable microorganisms,
- (4) It must be capable of surviving in the intestine, maintaining itself and having intraluminal metabolic activity
- (5) It must remain viable during storage and use.

Most commonly used probiotics come from genera Bifidobacterium and Lactobacillus, but other species are in trial.

Probiotics can be used alone, or in combination of different microorganisms.

There are many clinical trials investigating the therapeutic benefit of probiotics in IBS patients, but they are heterogeneous in terms of doses and species. (Table 1)

Probiotics have been investigated as a promising treatment for IBS, and have demonstrated beneficial effects in some patients. (2)

Most clinical trials have been effective in treating the symptoms, as show the Table 1 and Figure 2.

Some clinical trials did not show significant effect. (Table 2)

Only one clinical trial did show deterioration of the symptoms.

Current data indicate that mixture of probiotics is more effective than single ones.

Although, some strains have shown benefits for IBS when used alone (Table 2).

Mechanism of action of probiotics

It is well known that probiotics strains have numerous positive effects in the gastrointestinal tract.

Mechanisms of action of probiotics in the treatment of IBS are not fully known, but actually there are a lot of evidences and research about it. Figure 3 is a summary of all these mechanisms which participate in the improvement of patients with IBS.

Results

Most effective Non-effective

L. plantarum 299V L. rhamnosus GG

L. GG L. nodori ATCC 55730

B. infantis 35624 B. animalis DN 173010

Table 2: More effective, and non-effective probiotics used alone.

Most clinical trials have showed efficacy in the treatment of IBS, but most of them are more effective on single symptoms than on the entire IBS. Only some probiotics have showed efficacy improving the global symptoms of IBS. It is showed in Figure 2.

Also, as IBS is a complex and multifactorial disease, finding a treatment for all the symptoms, and types of IBS, will be difficult.

Conclusions

- Systematic reviews and meta-analyses have showed reasonable evidences that probiotics have a beneficial effect improving the symptoms of IBS. But it needs investigation about best strains, doses, time of treatment, use of mixtures or single probiotics and classification criteria for patients.
- The pathophysiology of IBS need more investigation. Understanding better the mechanisms of this disease also will do easier to find personalized treatments. For that reason, also it will be important to study the microbiota profile in patients.
- In the short term, the most important thing is to harmonize clinical trials to obtain more powerful results. And with them to identify probiotics that are the best candidates for treatment.

References

- Only relevant references are cited below. A detailed references list is available upon request for the committee:


