

IMPACT OF NUTRITIONAL INTERVENTION ON IRRITABLE BOWEL SYNDROME (IBS) IN OVERWEIGHT OR OBESE ADULT WOMEN: A SYSTEMATIC REVIEW

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Abstract: **Goal:** Relate nutritional intervention in the treatment and reduction of gastrointestinal symptoms in IBS in overweight and/or obese adult women. **Method:** This is a systematic review study, developed with scientific production indexed in the following electronic databases: LILACS, MEDLINE, SCIELO, PUBMED, GOOGLE ACADEMIC and scientific journals. The time frame covered the period between 2014 and 2021 in Portuguese, English. **Result:** We identified 14 studies that met the inclusion criteria for this systematic review. The analyzed studies involved 825 women aged between 18 and 65 years. **Discussion:** The results obtained in the treatment of IBS through prebiotics and probiotics were beneficial, with improvement in mood disorders, anxiety and depression, in addition to promoting weight loss. Clinical trials show that decreasing FODMAP-rich foods provides symptom relief in about 70% of IBS patients. Studies report that the pathophysiology of the disease depends on unhealthy eating habits and that high consumption of sugar in the diet contributes to mild inflammation and increased intestinal permeability. Excessive intake of indigestible carbohydrates can lead to accumulation in the gastrointestinal tract and increase gas production, with worsening symptoms. Long-term nutritional intervention is essential for better adherence, success and therapeutic consolidation. **Conclusion:** Dietary intervention guided by a professional nutritionist is a common recommendation in all studies. Recommendations such as: reduction of foods rich in sugars and carbohydrates, industrialized and fatty foods and increased consumption of fiber and proteins, in addition to the fractionation of meals from 4 to 6 meals a day, are guidelines that must be part of a diet therapy plan individualized.

Keywords: Irritable Bowel Syndrome, eating in Irritable Bowel Syndrome, gastrointestinal microbiota disorder in Irritable Bowel Syndrome.

INTRODUCTION

Irritable bowel syndrome (IBS) is a functional alteration of the intestine, considered as a risk condition for the development of other diseases such as cancer of the digestive system or inflammatory bowel diseases (Silva MT, et.al,2020; Quigley Eamonn MM, et. al., 2016). The worldwide prevalence is 10% to 20% of IBS, according to the guidelines of the World Gastroenterology Organization (WGO) with a predominance of approximately 73% of women, located in South America (Menezes F.B. et.al., 2020) IBS usually causes symptoms that can act at specific periods and is associated with other gastrointestinal disorders such as gastroesophageal reflux disease and dyspepsia. Varied symptoms related to food consumption and, typically, frequent bowel movements may occur, intervening in the daily and social life of many individuals. Symptoms sometimes occur due to an intestinal infection or are anticipated by major life circumstances, occur during stress phases such as after abdominal surgery (Quigley Eamonn MM, et. al., 2016).

The diagnostic criteria for IBS are based on symptoms in the absence of a detectable organic cause, thus serving as a differential diagnosis for several diseases that affect the gastrointestinal system, mainly chronic diseases (Martin A. et.al., 2017) and is also related to Pain syndromes, abdominal discomfort, bloating and the presence of diarrhea Psychological disorders such as anxiety and depression can promote changes in balance throughout the brain-gut axis, affecting the intestinal microbiota to the point of promoting the evolution

of diseases in the gastrointestinal system, including IBS, therefore, environmental as well as pathological factors can lead to the development of this syndrome (Martin A et. al, 2020). Prospective studies (Pickett-Blakel, 2014; Mendonça AP et.al, 2020; Lopes SS., et.al, 2019) demonstrated that visceral adiposity and waist circumference are associated with an increased risk of IBS, with increasing severity of symptoms. According to Mendonça, et.al 2020, obese people have a higher prevalence of IBS compared to non-obese people. The increased body mass index (BMI) is associated with the acceleration of intestinal transit, increasing symptoms such as diarrhea. In conclusion to the study, in overweight women, colonic and rectal transit was faster compared to eutrophic women, and the manifestation of pain, discomfort and edema are also correlated with colonic transit imbalance in obese individuals with IBS.

According to Lopes et.al. 2019, a balanced diet taking into account individual food intolerances may promote an improvement in intestinal functional changes in IBS. On the other hand, a diet low in fiber and high in saturated fat and fermentable carbohydrates can favor symptoms in the presence of the syndrome.

Foods called FODMAPs composed of oligosaccharides, disaccharides, monosaccharides and polyols are capable of causing phenomena in intestinal function, such as diarrhea, gas, abdominal pain and flatulence in susceptible people and must be avoided (Nilholm, C. et al., 2017). Carbohydrates are poorly absorbed in the small intestine and are rapidly fermented by bacteria from the intestinal environment (Pedersen, N. et. al. 2014; El-salhy, M., & Gundersen, D., 2015)

Therefore, a low FODMAPs diet helps patients to manage gastrointestinal symptoms and subsequently identify specific

food triggers (Yao, C.K. et al. 2014). Making a gradual introduction of these foods to adjust individual tolerance (Lomer, 2014), that adiposity, intestinal inflammation due to dietary influence would be triggers for IBS, (Aasbrenn, 2013) these interactions significantly affect the gastrointestinal tract and thus elevating intestinal transit (Sadik, Riadh, et.al. 2010). There are differences in the magnitude of as each FODMAPs reaches the lower GI tract, they are generally attributed to increased functional GI symptoms in IBS-prone individuals, and their food exclusion improved symptoms. Research points to the relationship between food, disease and health showing that the extent and purpose of food processing are associated with obesity and other chronic diseases such as irritable bowel syndrome and cancer (Fiolet T, et.al. 2018; Silvia FM et al., 2018). In the treatment of IBS, the low FODMAP diet has been applied, it is a diet consisting of poorly absorbed and slightly fermented carbohydrates that are osmotically agile in increasing the concentration of luminal water in the small intestine. There are also probiotics and prebiotics that restore digestion and absorption, are peculiar food elements that improve the intestinal ecosystem and are usually being applied to prevent dysbiosis in patients exposed to prolonged antibiotic or immunosuppressive therapy. Interference from probiotics depends on microbial strains (Seong-Eun Kim, 2019).

Dietary reeducation is the main non-pharmacological approach to relieve symptoms, many patients have various food intolerances associated with glucose malabsorption and impaired intestinal permeability. Individualized restrictive diets are recommended with the follow-up of a professional nutritionist. Increasing water intake and fiber consumption may be indicated, and reducing alcohol and caffeine

consumption is also part of the guideline (Saha L., 2014). To complete treatment in IBS cognitive behavioral therapy (CBT) may be required (Nadai R, et. al., 2017).

GOAL

Relate nutritional intervention in the treatment and reduction of gastrointestinal symptoms in IBS in overweight and/or obese adult women.

METHOD

This is a systematic review study, developed with scientific production indexed in the following electronic databases: LILACS, MEDLINE, SCIELO, PUBMED, GOOGLE ACADEMIC, scientific journals using the following descriptors: Irritable Bowel Syndrome, obesity and Irritable Bowel Syndrome, diet in Irritable Bowel Syndrome. The time frame covered the period between 2013 and 2021 in Portuguese and English.

RESULTS

We identified 51 studies involving the impact of nutritional intervention on IBS in obese and overweight adult women, however, only 14 met the inclusion criteria for this systematic review. The analyzed studies involved 825 women aged between 18 and 65 years. Table 1 describes the 14 studies that make up this systematic review.

DISCUSSION

According to the articles selected for this systematic review, the presence of overweight and obesity can promote worsening of gastrointestinal symptoms in IBS, such as: abdominal discomfort, gas, distention, inflammation, diarrhea or constipation. These symptoms negatively impact women's quality of life, affecting the gut and brain axis at risk for the development of disorders

such as anxiety and depression (Mendonça AP et al, 2020) According to Aasbrenn et al, 2018, there was a significant improvement in IBS symptoms with the weight loss project in a patient with high adiposity being proven through validated instruments for the evaluation of intestinal complications and health-related factors. As in the cohort study by Lee et al, 2015 in a 10-year period a correlation of anxiety and depression was seen in women suffering from IBS. For a better understanding of this relationship, as it was obtained through evaluations and not a medical diagnosis, but a possible link between diseases (Yao-Tung Lee et. al., 2015). The results obtained in the treatment of IBS through prebiotics and probiotics were beneficial, with improvement in mood disorders, anxiety and depression. In addition to the help of prebiotics and probiotics in the intervention for weight loss in obese people with IBS, they have had great results in intestinal symptoms such as reducing bloating and diarrhea, promoting satiety and helping the well-being of patients (Rodrigues G. A, et al, 2018; Elemer S et al, 2021). According to Elemer S. et al. 2018 the intervention of probiotics in adjusted amounts has offered a benefit by acting on the intestinal barrier, promoting immune barrier and protein release for anti-inflammatory action. More conclusive indications as cited in the review by Nadai R. et al, 2017; MM Pusceddu et al, 2018 demonstrated that the benefit of using *Bifidobacterium infantis* 35624 involving about 362 women with IBS, is related to the reduction of symptoms of pain, swelling and improvement in evacuation, referring to the treatment of 4 to 8 weeks, improvements were noticed linked to the anti-inflammatory IL-10 unit in relation to IL 12 pro-inflammatory compared to the placebo group, a multi-strain administration including a combination of LGG, *L. rhamnosus* LC

STUDY	PATIENTS AGE / TIME OF STUDY	CEPA/ MICROORGANISM	DESIGN OF THE COHORT STUDY	DESFECHO/ RESULT
França Teles et al (2020)	n.6 women - average between 23 and 47 years old 2 years of study	changes in the intestinal microbiota such as microorganisms: oligosaccharides, disaccharides, monosaccharides and fermentable polyols)	Adjunct quantitative cross-sectional study of the deductive method.	With the reduction in the consumption of fiber-rich foods, there was a reduction in IBS symptoms. As a result, the dietary fiber intake of all participants was much lower than recommended for women.
Aasbrenn, et al (2018)	n. 88: average between 20 and 45 years 4 years of study	Pathophysiological factors: gut microbiome	Prospective cohort study, which explored intestinal symptoms, health scores and biomarkers in morbidly obese individuals.	Positive: Reduction in body mass index during a weight loss program improved health in subjects with SII.
Mendonça, et al (2020)	n. 70: Average of 23 and 47 years 2 years of study	amines, lectins and preservatives.	A case-control study, to compare the profile of body adiposity, life habits and quality of life in women with SII.	The results showed a greater chance of developing comorbidities
Altobelli, et al (2017)	n.7: less than 50 years old 5 years of study	Fermentable oligosaccharides, disaccharides, monosaccharides and polyols	Meta-analysis study to provide an update on randomized controlled trials and cohort studies, examining them separately in relation to diet type.	According to the evidence, it obtained favorable results regarding the symptoms of IBS, reducing abdominal pain, bloating and diarrhea.
Nilholm, et al (2019)	N. 82: average of 26 46 years ago 3 years of study	starch, sucrose.	Randomized clinical trial study. With dietary intervention lasting 4 weeks.	The positive results. Extra intestinal symptoms were reduced, illness that was moderate/severe changed to none or mild illness.
Yao Tung Lee et al (2015)	N.43: average of 47 years 7 years of study	pathophysiological factors	Population-based cohort study. Relationship between IBS and the development of psychiatric disorders.	SII increased risk of depressive disorder, anxiety disorder, sleep disorder, and bipolar disorder.
Nadai, et al (2017)	N.91: average of 20 and 40 years 5 years of study	probiotics such as: Bifidobacterium	Systematic review study, important relationship of intestinal dysbiosis in the pathogenesis of SII.	Partially positive results. Patients who participated in the treatment had post-transplant symptomatic improvement.

Elemer Simon, et al (2021)	N.95: average of 31 50 years ago 1 year of study	Probiotics, prebiotics, symbiotics. How: Lactobacillus, Bifidobacterium, Faecalibacterium prausnitzii, Anaerostipes, and Bilophila.	Systematic review study using the synergistic combination of prebiotics and probiotics in SII.	Positive results. The use of probiotics, prebiotics in patients with IBS have shown their efficiency in improving symptoms.
Pusceddu, et al (2018)	N. 77: average of 20 40 years ago 4 years of study	microbiome, symbiosis.	Clinical trial of the manipulation of the intestinal microbiota through the ingestion of probiotics and prebiotics.	Positive results: Probiotic and prebiotic treatments can improve both IBS and mood disorders.
Liu, et al (2020)	N. 86: average of 20 45 years ago 2 years of study	Fermentable oligosaccharides, disaccharides, monosaccharides and polyols.	Review study with patients with IBS. Gastrointestinal symptoms were associated with food intake.	Positive results, patients report significant improvement of IBS symptoms after dietary manipulation.
Barroso et al (2021)	N. 50: average of 18 for 59 years 1 year of study	microbiome, symbiosis, dysbiosis.	Cross-sectional study with a quantitative design involving eutrophic overweight and obese women.	It was observed that overweight women are more likely to have intestinal hypermeability and signs and symptoms of intestinal dysbiosis compared to eutrophic women.
Staudache, et al (2017)	N. 104: average of 18 for 65 years 5 years of study	Bifidobacterium fecal microbiota.	Randomized controlled trial study, through dietary restriction of fermentable carbohydrates (a low FODMAP diet).	There was no significant interaction between interventions in adequate symptom relief.
Camilleri et al (2017)	N.20: average of 20 50 years ago 5 years of study	Fermentable oligosaccharides, disaccharides, monosaccharides and polyols	Review study on visceral pain management in functional gastrointestinal diseases, mainly in SII.	Positive results: effectively relieving gastrointestinal symptoms.
Rabeth Santos et al (2018)	N.6: average of 21 45 years ago 4 years of study	Fermentable osmotic carbohydrates oligosaccharides, disaccharides, monosaccharides and polyols	Review study of patients with IBS using the FODMAPs- restricted diet.	Positive results: restriction of FODMAPs in reducing IBS symptoms.

Table 1. Summary of studies and results found.

705, *B. breve* Bb99 and *Propionibacterium freudenreichii* spp *shermanii* JS by 6 months of administration also showed a reduction in symptoms in IBS. In a management with thermophilic strains of subspecies of: *B. longum*, *B. infantis*, *B. breve*, *L. acidophilus*, *L. casei*, *L. bulgaricus*, *L. plantarum* and *Streptococcus salivarius* was extensively studied in the period of 8 weeks also proving its effectiveness in improving symptoms, the modulation also brings a benefit to the gut-brain axis stabilized as neurotransmitters acting on the enteric nervous system (Nadai R, et.al, 2017; MM Pusceddu, et al. al, 2018). According to Altobelli, et. al. (2017) Clinical trials show that decreasing FODMAP-rich foods provides symptom relief in about 70% of IBS patients. According to Nilholm et al. (2019) the pathophysiology of the disease depends on unhealthy eating habits and that high consumption of sugar in the diet contributes to mild inflammation and increased intestinal permeability. Thus, they recommend avoiding sweets and soft drinks high in sugar and foods low in starch and sucrose. Excessive intake of indigestible carbohydrates can lead to accumulation in the gastrointestinal tract and increase gas production, with worsening symptoms. Long-term nutritional intervention is critical for better adherence, success and therapeutic consolidation (Nilholm, Clara et al, 2019). A limitation to treatment adherence may be that patients find the diet difficult and restrictive, and nutritional monitoring is critical to improving adherence to diet therapy in IBS (Liu J. et.al. 2020). Ingested foods are important for the evolution of microorganisms colonizing the intestinal microbiota, qualitative and quantitative dietary changes provide important substrates for the microbiota. Whole foods are also advisable as a way to minimize the risks of chronic diseases and metabolic changes,

resisting the digestive processes of the gastrointestinal tract, providing protection to the microbiota. (Machado, et.al. 2021). In the study by (Heidi et al. 2017) probiotic supplementation associated with a low FODMAPs diet is necessary because this diet has a significant influence on the microbiota, bringing the reduction of some bifidobacterium species.

Therefore, the importance of developing an individualized meal plan for patients with IBS is analyzed, with the aim of reducing symptoms, promoting weight loss and reducing the development of psychiatric disorders such as depression and anxiety. The support of a multidisciplinary team is essential for the success of this treatment. (LIMA, V. et al 2018)

CONCLUSION

Women with obesity suffer more from the symptoms of IBS and dietary intervention with low FODMAPs foods and probiotic supplementation with different strains, brings a significant improvement in intestinal function, in the symptoms presented in this syndrome in addition to assisting in the interaction with the intestine- brain. According to studies, IBS is quite common in overweight and obese patients. Dietary intervention guided by a professional nutritionist is a common recommendation in all studies. Recommendations such as: reduction of foods rich in sugars and carbohydrates, industrialized and fatty foods and increased consumption of fiber and proteins, in addition to the fractionation of meals from 4 to 6 meals a day, are guidelines that must be part of a diet therapy plan individualized (Aasbrenn M et. al., 2013).

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