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Probiotic and Prebiotic Supplementation in Lactose Intolerant Subjects

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Abstract

The aims of this study were as follows:

- **Aim 1:** To evaluate the effect of a 5-week probiotic treatment on gastrointestinal symptoms and breath hydrogen exhalation following a 5-week consumption of the same probiotic blend in combination with a prebiotic product in lactose intolerant (LI) subjects.
- **Aim 2:** To determine whether probiotic and prebiotic supplements are feasible to use and acceptable to subjects.
- **Aim 3:** To provide calcium education catered to a lactose intolerant population and measure effectiveness of educational sessions.

**Background**

Lactose intolerance is the inability to digest lactose, the sugar found in milk and dairy products. Roughly 25% of the United States population, primarily ethnic minorities, are affected with lactose intolerance, while 75% are affected worldwide. Lactose intolerance is caused by the deficient levels of the enzyme lactase. Lactase breaks down lactose into two monosaccharides, glucose and galactose, enabling normal digestion and absorption. When lactose cannot be digested properly, it becomes exposed to bacteria, thus producing uncomfortable intestinal symptoms.

**Objectives**

- **Purpose:** To assess whether the consumption of probiotics and prebiotics resulted in improving lactose intolerance symptoms.
- **Objective:** To examine the diet, specifically dairy foods, among subjects diagnosed with and without lactose intolerance.
- **Hypothesis:** Subjects with lactose intolerance will have lower intake of dairy foods and calcium, which could place them at higher risks for bone impairments.

**Methods**

- **Participants:** 45 participants with symptoms of lactose indigestion underwent a 10-week treatment for lactose intolerance.
- **Prebiotic Supplementation:** Participants were confirmed to have lactose intolerance through a sequence of hydrogen breath tests and questionnaires for the assessment of gastrointestinal symptoms.
- **Probiotic Supplementation:** A 5-week probiotic treatment was followed by a 5-week symbiotic, pro- and prebiotic treatment.
- **Dietary Analysis:** The participants filled out a 3-day dietary record at baseline, 5-week checkpoint, and at the end. The average of all 3 days was entered into the program to analyze 1 day overall.
- **Assessment:** Test and questionnaires for the assessment of symptoms were further reduced with the addition of prebiotics to the treatment. Probiotic and prebiotic supplementation was safe and well tolerated with no serious side effects reported in this group of subjects. To our knowledge, this is the first study with no serious side effects reported in this group of subjects. The beneficial bacteria in the gut, produce the enzymes for lactose catabolism. Prebiotics are indigestible fibers that serve as food for probiotics and as a trap for toxins/pathogens, thus reducing the gastrointestinal symptoms.

**Expected Results**

- **Calcium Intake:** It is expected that the participants’ milk and dairy consumption will be low.
- **Calcium Absorption:** It is expected that most of the calcium will be consumed via lactose free dairy or other sources.
- **Calcium Impairments:** It is also expected that the average consumption of calcium will increase throughout the duration of the experiment.
- **Demographics:** It is expected that there will be a co-relation between diet and lactose intolerance among certain demographics.

**Future Directions**

- Complete middle and endpoint dietary logs
- Compare and analyze all data
- Interpret

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