

conference abstract

observational

people

## Probiotics may help manage childhood obesity

Probiotics may help children and adolescents with obesity lose weight when taken alongside a calorie-controlled diet, according to a study being presented at e-ECE 2020. The study found that obese children who were put on a calorie-restricted diet and given probiotics *Bifidobacterium breve BR03* and *Bifidobacterium breve B632*, lost more weight and had improved insulin sensitivity compared with children on a diet only. These findings suggest that probiotic supplements and a calorie-controlled diet may help manage obesity in the younger population and reduce future health risks, such as heart disease and diabetes.

Obesity is a global health concern and can lead to a number of life-threatening conditions, such as diabetes and heart disease. Treatment and prevention is a serious public health challenge, especially in children and adolescents. *Bifidobacteria* are a group of probiotic bacteria that are part of the natural gut microbiome and help with preventing infection from other bacteria, such as *E.coli*, and digestion of carbohydrates and dietary fibre. During digestion, they release chemicals called short-chain fatty acids, which play an important role in gut health and controlling hunger. Low numbers of *Bifidobacteria* may impair digestion, affect food intake and energy expenditure, leading to body weight gain and obesity.

Previous studies suggested that probiotic supplementation with *Bifidobacteria* could help restore the composition of the gut microbiome, which may aid weight loss and could be a potential approach for obesity management. However, current research uses mixtures of different strains of probiotics and does not examine the effects of administering *Bifidobacteria* alone.

Dr Flavia Prodam and her team at the University of Piemonte Orientale, aimed to assess the impact of *Bifidobacteria* probiotic treatment in children and adolescents with obesity on a controlled diet, on weight loss and gut microbiota composition. 100 obese children and adolescents (6-18 years) were put on a calorie-controlled diet and randomly given either probiotics *Bifidobacterium breve BR03* and *Bifidobacterium breve B632*, or a placebo for 8 weeks. Clinical, biochemical and stool sample analyses were carried out to determine the effect of probiotic supplementation on weight gain, gut microbiota and metabolism.

The results suggested that children who had taken probiotics had a reduction in waist circumference, BMI, insulin resistance and *E.coli* in their gut. These beneficial effects demonstrate the potential of probiotics in helping to treat obesity in children and adolescents, when undergoing dietary restrictions.

“Probiotic supplements are frequently given to people without proper evidence data. These findings start to give evidence of the efficacy and safety of two probiotic strains in treating obesity in a younger population,” Dr Prodam comments.

The study suggests that supplementation with probiotics could modify the gut microbiome environment and beneficially affect metabolism, helping obese children or adolescents who are also undergoing a restricted diet to lose weight. However, larger studies over a longer period of time are needed to investigate this.

Dr Prodam explains, “The next step for our research is to identify patients that could benefit from this probiotic treatment, with a view to creating a more personalised weight-loss strategy. We also want to decipher more clearly the role of diet and probiotics on microbiome composition. This could help us to understand how the microbiota is different in young people with obesity.”

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## Abstract 2167

### Supplementation with *Bifidobacterium breve* BR03 and *Bifidobacterium breve* B632 favoured weight loss and improved insulin metabolism in children and adolescents with obesity in the BIFI-OBESE cross-over, randomized placebo-controlled trial

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**Background:** Variations in gut microbiota might impact metabolic functions like caloric intake and energy expenditure leading to body weight excess. Microbiota modulation may be a potential approach for obesity management, especially in subject characterized by specific microbial enterotypes.

**Objective:** We aimed to assess the impact of probiotic treatment in obese children and adolescents, under diet control, on weight loss, glucose, and insulin homeostasis, gut microbiota composition and SCFAs.

**Methods:** This was a cross-over, double-blind, RCT on 100 children and adolescents (6-18 years) affected by obesity with insulin-resistance (NCT03261466). The subjects on dietary training were randomized to treatment with  $2 \times 10^9$  CFU/AFU/die of *Bifidobacterium breve* BR03 (DSM 16604) and *Bifidobacterium breve* B632 (DSM 24706) or placebo for 8 weeks with a 4-weeks wash-out period. Clinical, biochemical and stool sample analyses were carried out at each time (T0-T3).

**Results:** At baseline, there were no differences in clinical and metabolic parameters between treatment and control group, except *Escherichia coli* concentration, which was higher in the placebo group. A mixed-effect model analysis revealed a carry-over effect on most of the variables, suggesting that the probiotic treatment had a prolonged effect over the washout period. Due to this event, only the results of the first phase (T0- T1) were deeply analyzed. For all the subjects (active and placebo) we observed significantly decreased BMI, BMI Z score, waist circumference (WC), systolic and diastolic blood pressure, insulin after OGTT, and *E. Coli* concentrations at T1. Probiotics further decreased WC (-3.51 cm,  $p < 0.05$ ), BMI Z score (-0.17 Kg/m<sup>2</sup>,  $p = 0.07$ ), fasting insulin (-4.57 mcUI/ml,  $p = 0.06$ ), HOMA IR (-1.1,  $p < 0.05$ ), *E. Coli* concentrations ( $p < 0.02$ ), and increased nearly to significance insulin sensitivity after OGTT. No differences were observed in inflammatory cytokines and GLP-1 levels at fasting. Of twenty-five SCFAs, probiotics decreased the 2-methyl- propanoic acid relative abundance ( $p < 0.02$ ). The PCoA analysis of SCFAs allowed defining four clusters of patients. Two clusters identified subjects that were healthier and had better responses in BMI Z score, WC, insulin resistance and sensitivity during probiotics.

**Conclusions:** Probiotic supplementation with *B. breve* BR03 and B632 has determined beneficial effects on weight and insulin metabolism in obese children and adolescents undergoing dietary training. Moreover, the microbiome-host configuration could be a predictor of the obesity phenotype and the efficacy of treatment with *B. Breve* strains.

## Notes for Editors

1. The presentation, "[Supplementation with \*Bifidobacterium breve\* BR03 and \*Bifidobacterium breve\* B632 favoured weight loss and improved insulin metabolism in children and adolescents with obesity in the BIFI-OBESE cross-over, randomized placebo-controlled trial](#)" was presented on Monday 7 September 2020 at 13:15 CET, online during e-ECE 2020.
2. e-ECE 2020 was held online on the 5-9 September. Catch up on [ESE On-Demand](#).
3. The [European Society of Endocrinology](#) was created to promote research, education and clinical practice in endocrinology by the organisation of conferences, training courses and publications, by raising public awareness, liaison with national and international legislators, and by any other appropriate means.