

Cystic Fibrosis Research News

Title:

LACK OF EFFICACY OF LACTOBACILLUS GG IN REDUCING PULMONARY EXACERBATIONS AND HOSPITAL ADMISSIONS IN CHILDREN WITH CYSTIC FIBROSIS: A RANDOMISED PLACEBO CONTROLLED TRIAL.

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What was your research question?

We aimed to confirm the findings of a pilot study, which demonstrated the beneficial effects of prolonged administration of *Lactobacillus rhamnosus* GG (LGG) on intestinal and respiratory manifestations, in a large group of children with cystic fibrosis (CF). We hypothesized that administration of this probiotic can improve pulmonary functions and nutritional status and reduce the number of pulmonary exacerbations.

Why is this important?

CF is a multi-organ disease involving the lung, the gastrointestinal tract, and the pancreas. Phenotype and clinical course are variable as a consequence of an individual's genetics and environmental factors. Intestinal microbiota composition is abnormal in subjects with CF, depending on the underlying disease, pancreatic enzyme deficiency/replacement, and aggressive antibiotic therapy. Previous studies demonstrated that probiotic

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supplementation reduces intestinal inflammation, restores intestinal microbiota and improves intestinal function in children with CF.

However, these preliminary results need to be confirmed in a larger population exploring the link between the intestinal microbiota and clinical outcomes.

What did you do?

We compared two groups of children with CF. One group received LGG for 1 year and the other group received a placebo. 95 children aged between 2 and 16 years with a severe mutation of the CF gene and with pancreatic insufficiency were enrolled from 5 Italian CF regional centres. Each child underwent 4 consecutive visits during the study and the following parameters were evaluated: weight, height, number of pulmonary exacerbations, number of antibiotic courses for respiratory symptoms, number of hospital admissions.

What did you find?

In contrast to the previous pilot study, we did not find differences in the number of pulmonary exacerbations or hospital admissions between children receiving LGG and children receiving the placebo. No difference was found for nutritional parameters and pulmonary function tests. In addition, the need for parenteral antibiotic therapy and the number of treatment days were similar in the two groups of children suggesting no difference in the severity of pulmonary exacerbations. A subgroup analysis considering two age groups (</>12 years) was also performed, but no difference was found for any clinical outcomes.

What does this mean and reasons for caution?

The results suggest that probiotics have limited impact on the clinical outcomes studied. However, children with an advanced phase of CF disease were enrolled and these children may be at an age and disease stage that is no longer sensitive to a clinical intervention such as the administration of a probiotic. Furthermore, several studies completed with various probiotic strains showed beneficial effects; therefore, further work is needed to determine if different strains produce different results. Although the current probiotic study includes the largest population followed in closely controlled conditions, the long duration of supplementation may have discouraged patients from participating thus limiting the number of children enrolled. Finally, in recent years, the improved knowledge of the disease and the use of new therapies had beneficially modified the Cystic Fibrosis course so that the effects of probiotics administration is no longer evident.



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What's next?

Although LGG did not improve pulmonary and nutritional status in our population of children, available evidence shows that probiotic intervention is a promising approach and we believe that further studies are warranted to investigate the effect of probiotics particularly at a very young age when the microbiota is still susceptible to change.

Original manuscript citation in PubMed

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