

Original Research

Role of probiotics as an adjuvant in allergic rhinitis

¹Sumit Walia, ²Vikrant Singh Ghiyali

¹Medical Officer (ENT), Regional Hospital, Kullu, Himachal Pradesh, India;

²Medical Officer (ENT), Civil Hospital Rohru, Shimla, Himachal Pradesh, India

ABSTRACT:

Background: The aim of the study was to evaluate the role of probiotics as an adjuvant in allergic rhinitis. **Material and methods:** It was a randomized, double-blind, placebo controlled trial comparing the probiotic strain *Lactobacillus paracasei* and *Lactobacillus fermentum* with placebo in patients with allergic rhinitis. The study included 100 subjects of both the sexes who were between 18-50 years of age as well as those having rhinitis. The subjects having any respiratory disease including asthma or chronic obstructive pulmonary disease or any recent history of sinusitis as well as nasal polyp had been excluded from the study. The chosen subjects had been randomly allocated into 2 groups. The treatment group got daily one capsule containing 4 * 10⁹ CFU/gm combination of *Lactobacillus paracasei* and *Lactobacillus fermentum* for 8 weeks. The control group got a placebo in a gelatin casing. During the study period, subjects were permitted to use antihistamine Levocetirizine for symptom relief whenever necessary. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Chi-square test, ANOVA and student test were used for evaluation of level of significance. **Results:** Mean overall symptom score at 0 week, 4 week and 8 week among the patients of the probiotic group was 14.12, 10.11, and 7.08 respectively while among the patients of the control group; it was 13.45, 11.63 and 9.91 respectively. The symptom scores of probiotic group at 4 and 8 weeks were significantly reduced in comparison with control group. Mean overall quality of life symptom score at 0 week, 4 week and 8 week among the patients of the probiotic group was 119.32, 79.56 and 59.99 respectively while among the patients of the control group; it was 118.32, 89.86 and 75.63 respectively. The quality of life scores of probiotic group at 4 and 8 weeks were significantly reduced in comparison with control group. **Conclusion:** It was concluded that the probiotics may have an important role in the treatment of allergic rhinitis. Significant improvement in both nasal symptoms and quality of life occurs with the use of probiotics in AR patients. The clinical benefit of probiotic therapy depends on numerous factors, such as type of bacterium, route of administration, dosing, regimen, and other underlying host factors.

Keywords: probiotics, allergic rhinitis

Received: 11 July, 2022

Accepted: 16 August, 2022

Corresponding author: Vikrant Singh Ghiyali, Medical Officer (ENT), Civil Hospital Rohru, Shimla, Himachal Pradesh, India

This article may be cited as: Walia S, Ghiyali VS. Role of probiotics as an adjuvant in allergic rhinitis. J Adv Med Dent Scie Res 2022;10(9):84-86.

INTRODUCTION

Allergic diseases have become a major public health problem over the past few decades. The prevalence of eczema, food allergy, and asthma has all increased dramatically during this time, particularly in Western society. It is believed that between 20 and 30% of individuals living in Western countries suffer at least one form of allergic disease. The impact on health care systems and society in general is significant; with allergic disease one of the most common causes of chronic illness, hospital admissions as well as school absenteeism. Furthermore, the emotional and psychological burden on parents and families is

substantial. Parents of children with food allergy have reported a diminished quality of life compared to parents of children with rheumatological conditions, indicating a substantial psychological burden associated with these types of diseases.¹

Allergic Rhinitis is a symptomatic disorder of the nose induced after allergen exposure due to an IgE-mediated inflammation of membranes lining the nose. It is clinically defined as a symptomatic condition with four major symptoms as anterior or posterior rhinorrhoea, sneezing, nasal itching & nasal congestion. Allergic Rhinitis symptoms result in sleep disturbance, fatigue, depressed mood and cognitive

function compromise that impairs quality of life and productivity. There may be associated conjunctivitis, postnasal drip, Eustachian tube dysfunction, otitis media, sinusitis & in children, dental malocclusions & facial deformities also. Triggers of Allergic rhinitis are domestic allergens as mites, domestic animals, insects or of plant origin; common outdoor allergens include pollens and moulds; occupational triggers as latex; tobacco smoke; automobile exhaust include ozone, oxides of nitrogen and sulphur dioxide; aspirin and other non-steroidal anti-inflammatory drugs.²

MATERIAL AND METHODS

It was a randomized, double-blind, placebo controlled trial comparing the probiotic strain *Lactobacillus paracasei* and *Lactobacillus fermentum* with placebo in patients with allergic rhinitis. The study included 100 subjects of both the sexes who were between 18-50 years of age as well as those having rhinitis. The subjects having any respiratory disease including asthma or chronic obstructive pulmonary disease or any recent history of sinusitis as well as nasal polyp had been excluded from the study. The chosen subjects had been randomly allocated into 2 groups. The treatment group got daily one capsule containing 4 * 10⁹ CFU/gm combination of *Lactobacillus paracasei* and *Lactobacillus fermentum* for 8 weeks. The control group got a placebo in a gelatin casing. During the study period, subjects were permitted to use antihistamine Levocetizine for symptom relief whenever necessary. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Chi-square test, ANOVA and student test were used for evaluation of level of significance.

RESULTS

Table 1: Overall comparison of improvement of symptom score within group

Time interval	Probiotic group		Control group	
	Mean	SD	Mean	SD
Visit 1(0 week)	14.12	1.93	13.45	1.98
Visit 2 (4 weeks)	10.11	1.87	11.63	1.35
Visit 3(8 weeks)	7.08	1.61	9.91	1.35
p- value	0.000		0.000	

*: Significant

Mean overall symptom score at 0 week, 4 week and 8 week among the patients of the probiotic group was 14.12, 10.11, and 7.08 respectively while among the patients of the control group; it was 13.45, 11.63 and 9.91 respectively. The symptom scores of probiotic group at 4 and 8 weeks were significantly reduced in comparison with control group.

Table 2: Overall comparison of improvement of quality of life score within group

Time interval	Probiotic group		Control group	
	Mean	SD	Mean	SD
Visit 1(0 week)	119.32	11.66	118.32	12.11
Visit 2(4 week)	79.56	12.12	89.86	10.21

Visit 3(8 week)	59.99	18.32	75.63	11.23
p- value	0.002		0.000	

*: Significant

Mean overall quality of life symptom score at 0 week, 4 week and 8 week among the patients of the probiotic group was 119.32, 79.56 and 59.99 respectively while among the patients of the control group; it was 118.32, 89.86 and 75.63 respectively. The quality of life scores of probiotic group at 4 and 8 weeks were significantly reduced in comparison with control group.

DISCUSSION

Probiotics have proven beneficial in a number of immune-mediated and allergic diseases. Several human studies have evaluated the efficacy and safety of probiotics in allergic rhinitis; however, evidence for their use has yet to be firmly established.³

In this study, Mean overall symptom score at 0 week, 4 week and 8 week among the patients of the probiotic group was 14.12, 10.11, and 7.08 respectively while among the patients of the control group; it was 13.45, 11.63 and 9.91 respectively. The symptom scores of probiotic group at 4 and 8 weeks were significantly reduced in comparison with control group.

Also, the mean overall quality of life symptom score at 0 week, 4 week and 8 week among the patients of the probiotic group was 119.32, 79.56 and 59.99 respectively while among the patients of the control group; it was 118.32, 89.86 and 75.63 respectively. The quality of life scores of probiotic group at 4 and 8 weeks were significantly reduced in comparison with control group.

Wang MF et al in 2004 assessed whether ingestion of fermented milk containing *Lactobacillus paracasei*-33 (LP-33), a strain newly isolated from the human intestinal tract, can improve the quality of life of patients with perennial allergic rhinitis. In a randomized, double-blind, placebo-controlled trial, we gave patients fermented milk with (n = 60) or without (n = 20) the addition of LP-33 (2 x 10⁹) colony-forming units per bottle) for 30 days. A modified questionnaire concerning pediatric rhinoconjunctivitis quality of life was administered to all subjects or their parents at each clinical visit. Scores for the overall quality of life significantly decreased in the LP-33 group as compared with the placebo group, in both frequency and level of bother after the 30-day treatment. Subjects reported no severe adverse effects such as fever, abdominal pain, or diarrhea. The results suggested that ingestion of LP-33-fortified fermented milk for 30 days can effectively and safely improve the quality of life of patients with allergic rhinitis, and may serve as an alternative treatment for allergic rhinitis.⁴

Ishida Y et al in 2005 examined the efficacy of orally administered *Lactobacillus acidophilus* strain L-92 (L-92) on perennial allergic rhinitis. In a randomized, double-blind, placebo-controlled clinical trial, 49

patients with perennial allergic rhinitis were randomized to receive either 100 mL of heat-treated fermented milk containing L-92 (n = 25) or acidified milk without lactic acid bacteria (placebo; n = 24) for 8 wk. The severity of symptoms was evaluated based on the changes in the scores of clinical symptoms. Oral administration of milk fermented with L-92 resulted in a statistically significant improvement of nasal symptom-medication scores. Ocular symptom-medication scores of patients in the L-92 intervention group tended to improve compared with those in the placebo group. In addition, clear decreases of the scores of swelling and color of the nasal mucosa were observed in the L-92 intervention group at 6 and 8 wk after the start of ingestion of fermented milk. There were no significant differences in serum antihouse dust mite immunoglobulin E levels nor in T helper type 1/T helper type 2 ratio between the 2 groups. These results suggested that oral administration of L-92 can alleviate the symptoms of perennial allergic rhinitis, however, statistically significant changes were not shown in blood parameters.⁵

CONCLUSION

It was concluded that the probiotics may have an important role in the treatment of allergic rhinitis.

Significant improvement in both nasal symptoms and quality of life occurs with the use of probiotics in AR patients. The clinical benefit of probiotic therapy depends on numerous factors, such as type of bacterium, route of administration, dosing, regimen, and other underlying host factors.

REFERENCES

1. Primeau MN, Kagan R, Joseph L, Lim H, Dufresne C, Duffy C, Prchal D, Clarke A. The psychological burden of peanut allergy as perceived by adults with peanut allergy and the parents of peanut-allergic children. *Clin. Exp. Allergy*. 2000; 30, 1135–1143.
2. Varshney J, Varshney H. Allergic Rhinitis: an Overview. *Indian J Otolaryngol Head Neck Surg*. 2015;67(2):143-149.
3. Luo C, Peng S, Li M, Ao X, Liu Z. The Efficacy and Safety of Probiotics for Allergic Rhinitis: A Systematic Review and Meta-Analysis. *Front Immunol*. 2022 May 19;13:848279.
4. Wang MF, Lin HC, Wang YY, Hsu CH. Treatment of perennial allergic rhinitis with lactic acid bacteria. *Pediatr Allergy Immunol*. 2004 Apr;15(2):152-8.
5. Ishida Y, Nakamura F, Kanzato H, Sawada D, Hirata H, Nishimura A, et al. Clinical effects of *Lactobacillus acidophilus* strain L-92 on perennial allergic rhinitis: a double-blind, placebo-controlled study. *J Dairy Sci*. 2005;88(2):527–533.