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Therapeutic Effects of Probiotics in Patients with Atopic Dermatitis

YIM, JUN HEE, DUK HAN KIM, JA KYUNG KU, YOONSUNG KANG, MI-YEON KIM, HYUNG OK KIM, MYUNG-JUN CHUNG[1], AND YOUNG MIN PARK*

Department of Dermatology, Kangnam St.Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul 137-040, Korea
[1]Research Institute of Cell Engineering, Cellbiotech, Co. Ltd., Seoul, Korea

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Abstract Recent studies have suggested that oral bacteriotherapy with probiotics might be useful for preventing and managing childhood atopic dermatitis (AD). The purpose of this investigation was to evaluate the efficacy and safety of oral treatment with probiotics for adolescent and adult AD patients as well as for childhood AD patients. Sixty-four patients with mild to moderate AD were recruited for treatment with a mixture of four probiotic strains (*Lactobacillus rhamnosus*, *Lactobacillus plantarum*, *Lactobacillus casei*, and *Bifidobacterium lactis*) twice daily for 8 weeks. The degree of pruritus was determined by a 10-point visual analog scale every other week, and the patients' global assessments of their clinical responses (*i.e.*, better, unchanged, or worse) was done at the end of intervention. The clinical severity of the eczema was evaluated by eczema area and severity index (EASI) score every other week. As laboratory markers, total immunoglobulin E (IgE), eosinophil cationic protein (ECP) in the serum, and cytokine production [interleukin-4 (IL-4), interleukin-10 (IL-10), and interferon-γ (IFN-γ)] by the peripheral blood mononuclear cells (PBMCs) were measured at the beginning and at the end of intervention. Of the 64 enrolled AD patients, only 50 patients finally completed the 8-week study. After 8-week treatment with probiotics, the EASI score was significantly improved (p<0.0001), 50% of the patients experienced improvement of their eczema, and significant improvement of the pruritus was also observed (p=0.0002). The effect was more pronounced for the patients with very high IgE levels (>1,000 ku/l) or for the patients with moderate disease severity. There was no significant difference in the therapeutic effects between the childhood AD and adolescent and adult AD patients. There were no significant changes of cytokines, as well as the total IgE and ECP levels, in the patients' serum. Treatment with the mixture of four probiotic strains was generally well tolerated. Our results suggest that the treatment with the mixture of four probiotic strains is beneficial for the management of the adolescent and adult AD patients, as well as for the childhood AD patients.

Key words: Probiotics, adolescent and adult, atopic dermatitis

*Corresponding author
Phone: 82-2-590-1498; Fax: 82-2-594-3255;
E-mail: knderma@catholic.ac.kr

Atopic dermatitis (AD) is a common chronically relapsing inflammatory skin disease that is characterized by severe pruritus, dry skin, excoriation, and lichenification. It runs a course of remission and exacerbation, and significantly affects many aspects of the patient's quality of life in a negative fashion; furthermore, the management of AD is complex and challenging [11]. The conventional treatment regimen for AD has included regular skin care with emollients and the use of topical corticosteroids during disease exacerbations [16]. Administration of topical corticosteroids might control the symptoms, especially for mild to moderate eczema, but relapses are common and extensive. Moreover, the prolonged use of corticosteroids carries a risk of local and systemic side effects [15, 16]. Because of these safety limitations, the new nonsteroidal, topical, inflammatory cytokine inhibitors, pimecrolimus cream [2] and tacrolimus ointment [9], have been considered as a therapeutic option for the long-term management of AD. Oral bacteriotherapy with probiotics has recently been explored as a therapeutic option for AD in Western countries.

Probiotics are defined as those products containing a sufficient number of viable microorganisms to alter the host's microflora for producing beneficial health effects [22]. The clinical studies to date have shown that administration of probiotics for childhood atopic disease translates into fewer atopic symptoms and prevents atopic disease in high-risk children [6–8, 12–14, 18–19]. The exact mechanism of action is unknown, but it was suggested that the increased level of transforming growth factor β2 (TGF-β2) [18], IL-10 [13], or IFN-γ [14] may be an explanation for