

Microbial extract as a nature exposure material reduces the need for atopic dermatitis medication

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Abstract

The biodiversity hypothesis proposes that contact with microbially rich natural environments lowers the risk of atopic diseases, while urban living is linked to increased risk. This study was the first large, randomized, double-blind, placebo-controlled clinical trial assessing the impact of a biodiversity-based intervention on atopic dermatitis. A total of 142 participants were divided into an experimental group that used a topical lotion containing an inactivated, diverse microbial extract as nature exposure material, and a control group that used a lotion without the extract. The lotion was used throughout the Finnish winter (7 months), when atopic dermatitis typically worsens and nature exposure is at its lowest. Use of atopic dermatitis medication was not restricted during the trial but was recorded via biweekly questionnaires. Skin condition was monitored by transepidermal water loss (TEWL) and erythema measurements, and disease severity was assessed using validated methods such as the Eczema Area and Severity Index (EASI). We observed fewer medication users in the experimental group compared to the control (OR 0.26 95% CI [0.59, 0.11]) and fewer days of use (effect size $r = 0.297$). Additionally, the nature exposure material appeared to prevent winter-related skin barrier decline (effect size $r = 0.194$) and the increase in erythema (Cohen's $d = -0.362$ 95% CI [-0.620, -0.102]), both of which were observed only in the control group. The exposure material was well tolerated, with no difference in reported adverse events. Overall, the inactivated microbial extract in the lotion appears safe and may complement existing treatments for atopic dermatitis.