USING A SPECIFIC EMOLLIENT TO MANAGE SKIN MICROBIOME DYSBIOSIS

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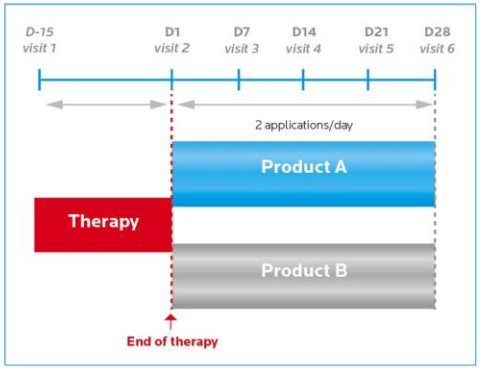
INTRODUCTION

Changes in the composition of microbial communities that colonize skin have been linked to several dermatological diseases, in particular atopic dermatitis (AD). This pathology has long been associated with *Staphylococcus aureus* colonization or infection and is often temporarily managed with antimicrobial therapies. It has been described that the proportion of *Staphylococcus* sequences, *particularly S. aureus*, is greater during disease flares than at baseline or post-treatment. However, the change of the bacterial communities associated with atopic dermatitis and their responses to therapy remain poorly understood. We speculated that, as it has been reported for some acute intestinal diseases, and based on the observations made in the thermal therapeutic center of La Roche-Posay, an emollient supplemented with a biomass of non-pathogenic bacteria *Vitreoscilla filiformis* (Vf) grown in a medium containing thermal water (LRP-VFB) could have a clinical effect on the disease[1].

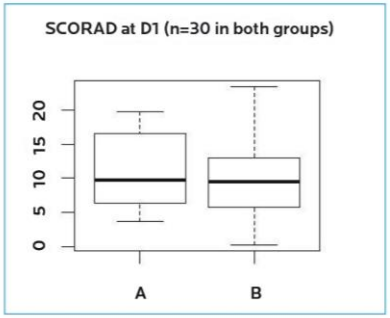
MATERIALS AND METHODS

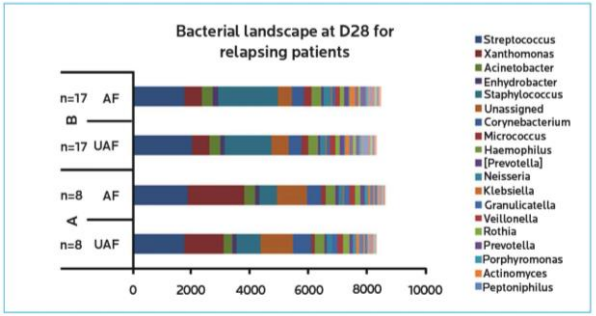
This double-blind randomized comparative study was conducted with 60 AD patients (SCORAD at D-15 = 21 ± 8) treated by drug therapy in order to improve their SCORAD by at least 25% between D-15 and D1. At D1, patients were divided into 2 groups and treated twice daily with the emollient containing LRP-VFB (Product A) or another emollient prescribed in AD (product B). Recurrence of flare-ups and microbial communities were characterized at the beginning (D1) and at the end of the treatment period (D28) from swabs taken, under axenic conditions, from affected and proximal unaffected skin areas. The 16S rRNA bacterial gene was used to analyze the composition of bacterial communities.



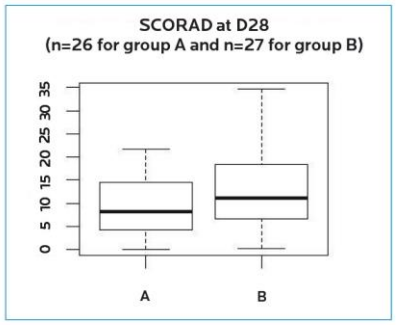
RESULTS

Before any treatment (at D1) the average SCORAD of each group (11±5 and 10±6 respectively) and their microbial communities of an affected area (AF) and the closest unaffected (UAF) area for each participant were similar.

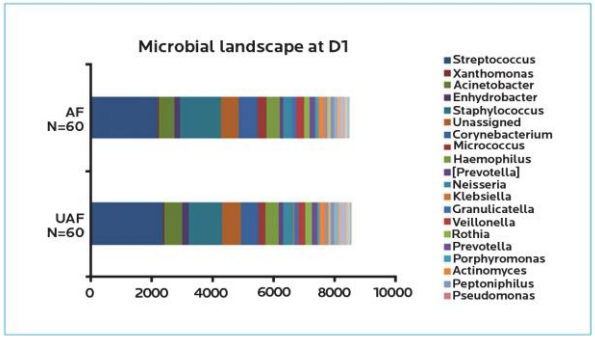




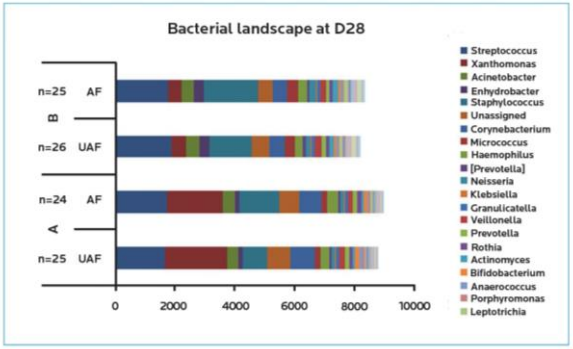
One month after the end of the therapeutic treatment, the average SCORAD of patients treated with product A was significantly lower than that of the patients treated by product B (SCORAD = 9±6 and 13±10 respectively, p=0.0185 corresponding to -11% versus +35%).



The microbial landscape of AF and UAF areas was similar in both groups but very different between each treatment. Particularly a significantly increased level of *Xanthomonas* genus (p=0.0036) was noticed in the group treated by product A (versus product B). On the other hand, the level of *Staphylococcus* genus increased between D1 and D28 in the group treated by product B (p=0.0186 on UAF and p=0.2646 on AF). This increase in *Staphylococcus* genus is not observed in the group treated by product A (p=0.8026 on UAF, p=0.8179 on AF).



Interestingly these differences in the microbial landscape were more pronounced for patients in relapse at D28 (patients with an increased SCORAD versus D1) corresponding to 9 patients treated with the product A (30%) and 18 patients treated with the product B (60%). Of particular note, the associated SCORAD worsening was less in the group treated by product A (46%) vs the group treated by product B (79%).



CONCLUSION

Using a high-throughput sequencing approach that targets a portion of the 16S rRNA gene and comparing an affected area and the closest non affected area for each participant, we demonstrated that a specific emollient containing a biomass of non-pathogenic bacteria *Vitreoscilla filiformis* grown in a medium containing LRP thermal water is able to regulate skin microbiome, restore the barrier function and significantly reduce flare-ups in comparison to another prescribed emollient. This study helps to design innovative therapeutic strategies for the control of atopic dermatitis and potentially other chronic inflammatory skin diseases such as acne, rosacea or psoriasis.

REFERENCE

1. Mahe YF, Perez MJ, Tacheau C, Fanchon C, Martin R, Rousset F, Seite S. A new *Vitreoscilla filiformis* extract grown on spa water-enriched medium activates endogenous cutaneous antioxidant and antimicrobial defenses through a potential Toll-like receptor 2/protein kinase C, zeta transduction pathway. *Clin Cosmet Investig Dermatol* 2013, **30**: 191-196