ATOPIC ECZEMA/DERMATITIS

S. AUREUS BIOFILM IN ATOPIC DERMATITIS: IN VITRO MODEL AND CLINICAL AD STUDY

Stéphanie Bredif [1] - Gaetan Boyer [1] - Gaelle Bellemere [1] - Clarence De Belilovsky [1] - Franck Menu [1] - M. Meloni [2] - Caroline Baudouin [1]

Laboratoires Expanscience, Innovation R&d Direction, Epernon, France [1] - Vitroscreen, Vitroscreen, Milano, Italy [2]

Introduction: Biofilm-associated bacteria show an innate resistance to antibiotics and host innate immune defenses. The presence of Staphylococcus aureus biofilm in AD lesions has recently been described.

Objective: To evaluate the efficacy of an emollient on SA presence and biofilm both in vitro and in vivo.

Materials and Methods: In vitro model: 6h and 24h after colonization of reconstructed human epidermis by SA, adhering bacteria were counted and biofilm formation at the epidermal surface was observed by scanning electron microscopy (SEM).
In vivo: Swabs were taken on forearms, face and AD lesions in 45 infants out of 120 involved in a 6-months open label, controlled AD prevention study. Children with genetic atopic risk were enrolled at 2-3 weeks of life and randomized to receive or not daily emollient applications. Children were analyzed for SA and SE (S. epidermidis) by qPCR. D-squames were performed on forearms of 6 children to visualize SA and its biofilm if any.

Results: In vitro: the formation of SA biofilm has been visualized on the epidermal surface by SEM. The emollient inhibited SA adhesion and decreased biofilm formation.
Clinical study: Infants were poorly colonized with SA (6/45 on forearms and 15 on the face) and largely colonized with SE (42 on forearms and 35 on the face). Only 2/11 AD lesions were found positive for SA and 9/11 for SE. Biofilm has been visualized in one infant at D0. Emollient application induced the diminution and SA and disappearance of biofilm.

Conclusion: SA-colonized epidermis models were used to evaluate the efficacy of emollient on SA adhesion and biofilm. As biofilm is a rare event in the development of AD early in life, this reinforces the importance of its prevention strategies as shown in our clinical study.