PAEDIATRIC DERMATOLOGY

INFANT SKIN MATURATION AND SKIN MICROBIOME: THE ROLE OF INNATE IMMUNITY AND ENZYMATIC DESQUAMATION

G Stamatas [1] *- T Oddos* [1]

Johnson & Johnson Sante Beaute France, Skin Care R&d, Issy-les-moulineaux, France [1]

Introduction: Over the first years of life the infant epidermis undergoes a maturation process that is paralleled by an evolution of the skin microbiome. Both the presence of innate immune markers and the rate of corneocyte desquamation affect the microbial populations on the skin surface.

Objective: To investigate if innate immunity markers follow the skin maturation process early in life and to compare the activity of stratum corneum desquamation enzymes between infants and adults.

Materials and Methods: 117 infants (3-36 months) participated in the first study. We extracted human beta defensin-1 (hBD-1), interleukin 1 alpha (IL-1α), and its receptor antagonist (IL-1RA) using Transdermal Analysis Patches from the skin surface of the posterior lower leg area. The extracts were analyzed by spot-ELISA. In a second study, the chymotrypsin-like and caseinolytic activity was assessed in a fluorometric assay on tape strips collected from 52 infants (3-24 months) and 27 adults (20-40 years) at the dorsal forearm and upper inner arm. Both studies were approved by institutional ethics committees and conducted following collection of informed consent by the infant parents.

Results: Although the IL-1RA/IL-1α ratio did not change significantly with age, the hBD-1 levels on the skin surface were found to be higher early in life and decrease with infant age. Moreover, the chymotrypsin–like activity for infant skin was comparable to the adult level, while the caseinolytic specific activity was significantly higher for the infant cohort.

Conclusions: As is skin microbiome evolves early in life, we show a concomitant slow decline in the cutaneous innate immunity that presumably protects the skin before adaptive immunity can take takes over. The observed higher desquamatory activity in infant skin may also play an additional protective mechanism controlling the microbial populations adherent to surface corneocytes.