



PAEDIATRIC DERMATOLOGY

INFLUENCE OF AGE ON NEUROTROPHIC ACTIVITY OF JUVENILE AND ADULT KERATINOCYTES: EXPLORATORY STUDY

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Introduction: The epidermis has a dual function as a barrier and a sensory interface between the body and the environment. The epidermis is richly innervated by free nerve endings, originating from sensory neurons. A close communication exists between sensory neurons and skin cells, playing important roles in well-being sensations and skin homeostasis. Functional skin adaptation is a continuous process taking place in the first years of life. While the development of barrier function is well documented, little is known about the interactions between nervous system and skin cells during skin development and maturation.

Objective: To explore neurosensory system in juvenile skin and to investigate the influence of keratinocytes of different ages on the development of sensory neurons.

Materials & Methods: Immunostaining of neuron-markers and nociceptors were performed in skin explants from donors of different age-groups: infants (6-18 months old), toddlers (2-3 years old) or children (4-7y) compared to young adults (18-20y).

Sensory neurons were cultured in explants in collagen. Encapsulated suspensions of keratinocytes from different ages, were dropped at two opposite poles of the culture well. After 6 days of incubation, neurite length and orientation between the 2 poles were visualized by beta-tubulin staining and measured.

Keratinocytes of different age-groups were co-cultured with neurons to analyze neurotrophic factors expression by PCR.

Results: Differences in the expression of neuronal markers and nociceptors were observed between adults and juvenile skin explants. Neurites elongated preferentially and significantly towards juvenile keratinocytes rather than adult keratinocytes; and a large number of genes were differentially regulated between adults and juvenile keratinocytes, suggesting an evolution of regulation mechanisms of neuronal innervation of neurosensory system with age.





Conclusion: This study highlights differential regulations on skin neurosensory system in juvenile skin, suggesting particular interactions between neuronal and skin cells during infancy and childhood.

