Psychosomatic Aspects in the Development of Allergies and New Soft Touch Nerves

In the past years, it has become increasingly clear that environmental aspects and living conditions in industrialized countries are important factors in the pathogenesis of allergies. Beside the hygiene hypothesis – inverse relationship between childhood infections and the prevalence of atopic disease [Strachan, 1994; Gereda et al., 2000] – there is new evidence for psychosomatic influences on the development of allergies. A recent review by van Hertzen [2002] in the Journal of Allergy and Clinical Immunology outlines that prolonged maternal stress and excessive cortisol secretion may affect the developing immune system – especially Th1/Th2 cell differentiation and the increasing susceptibility to asthma and atopy in genetically predisposed individuals. This stress hypothesis was corroborated by Buske-Kirschbaum et al. [2000] who pointed out a hypothetical pathway from stress to the immunological dysregulation of atopic disease. Recent research has provided convincing evidence that the risk of developing atopy and asthma is associated with a diminished capacity to produce IFN-γ during fetal life [Holt, 1999; Prescott et al., 1999]. Persisting stress-induced elevated cortisol levels in the pregnant mother may affect the developing immune system in genetically predisposed children. Furthermore, mothers of atopic children seem to have more difficulty in communicating with their child. If they regard their child as difficult to handle, they tend to be depressive and helpless, and show anxiety and over-protection in their education habits [Pauli-Pott et al., 1997]. Maunder and Hunter [2001] demonstrated that insecure attachment in early childhood leads to physiological stress reactions which may influence development of the immune system. In summary, it seems to become evident that psychosomatic aspects do indeed influence the development of atopic diseases.

Another highlight of recently published articles was the discovery of special soft touch nerves by Hakan Olausson of Sahlgrenska University Hospital in Goteborg/Sweden and his research group [Olausson, 2002]. They found that a special nerve type senses tender touch. The team examined a woman whose main touch nerves have been killed by disease. She cannot feel a prod, but can detect the light stroke of a paintbrush on her arm – rating it as "pleasant". Using brain imaging, Olausson and his group found that slow stroking stimulates a brain area that deals with emotions, love and sexual arousal. According to Olausson, these nerves “are responsible for the pleasant aspects of touch” and distinct from another nerve type that discriminates shape and vibration. There is some evidence that touch is important for survival as the well-known experiments of Harlow and Harlow have shown. The sensitive nerves lie under hairy skin – that is, everywhere except the palms of the hands and soles of the feet. Olausson’s findings come along with another recent study which identified a touch receptor in the skin. The receptors that convert touch to an electric signal are still largely unknown. One such receptor is a protein called DRASIC [Welsh et al., 2001]. The protein is a channel through which ions cross the cell membrane. Mice genetically engineered to lack this channel have nerves that are twice as sensitive to a caress, but less receptive to painful pinches, acid or heat. Another ion channel could be BNC1 which responds to delicate touch [Price et al., 2000]. According to the researchers through different combinations these and other proteins form receptors that determine which type of touch or pain a nerve reacts to.

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References


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