

Stress during childhood increases the risk of allergies

June 18 2008

Moving house or the separation of parents can significantly increase the risk of children developing allergies later on. These are the results from a long-term study correlating life-style, immune system development and allergies, led by the Helmholtz Center for Environmental Research in Leipzig (UFZ), the Helmholtz Zentrum München and the "Institut für Umweltmedizinische Forschung" (IUF) in Duesseldorf.

The researchers had examined blood samples taken from 234 six-year old children and discovered increased blood concentrations of the stress-related peptide VIP (vasoactive intestinal polypeptide) in connection with moving house or the separation of parents. The neuropeptide VIP could take on a mediator role between stress events in life and the regulation of immune responses, researchers write in the scientific journal *Pediatric Allergy and Immunology*. The fact that stress events can have an influence on the development of allergies has been known for a while. The mechanisms behind this however remained unexplained for a long time. In the study that has now been published, stress events were investigated for the first time during early childhood within a large epidemiological study using immune and stress markers.

Stress events during childhood are increasingly suspected of playing a role in the later development of asthma, allergic skin disorders, or allergic sensitisations. Dramatic life events like the death of a family member, serious illnesses of a family member or the separation of parents, but also harmless events like for example moving house are suspected of increasing the risk of allergies for the children affected.

The immune system obviously plays a mediator role between stress on the one hand and allergies on the other. Since these mechanisms had hardly been understood before, researchers attempted to identify stress-related factors showing an influence on the immune system, in the context of an epidemiological study (LISA). At the same time as the blood tests, researchers together with colleagues from the Institute for Social Medicine at the University of Lübeck also analysed the most diverse social factors in the children's environment, in order to find out which factors are causing stress-related regulation deficiencies of the immune system. With children, whose parents had separated over the last year, researchers found increased blood concentrations of the neuropeptide VIP (vasoactive intestinal polypeptide) as well as an increased concentration of immune markers, which are related to the occurrence of allergic reactions, like for example the cytokine IL-4. By comparison, serious diseases or the death of close relatives led to no remarkable changes.

Likewise, the unemployment of parents was not associated with increased concentrations of the stress-related peptides in the children's blood. As tragic as these events are, they are obviously however of less significance for the stress reactions of children than for example a separation or the divorce of parents, UFZ researchers have concluded. As was already shown in an earlier publication from the same study, increased concentrations of the stress peptide VIP can also be proven in the blood of children after moving house (similar to the separation of parents). Preceding investigations in LISA showed that there is a relationship between an increased concentration of the neuropeptide VIP and allergic sensitisations among six-year old children. Even if the results were to be interpreted carefully, because of the comparatively small number of children affected, they nevertheless provide valuable indications as to what exactly happens to the body through stress.

The investigations are based on data from 6-year old children from the

LISA study. LISA stands for "Lifestyle - Immune System - Allergy" and investigates the influences of life-styles on the immune system development in early childhood and the emergence of allergies.

In addition to the Helmholtz Center for Environmental Research in Leipzig (UFZ), the Helmholtz Zentrum München, the German Research Center for Environmental Health, and the "Institut für Umweltmedizinische Forschung" (IUF) in Duesseldorf, other universities and clinics are also participating partners, including the Municipal Hospital "St. Georg" in Leipzig. For the LISA study over 3000 newborn children in the cities of Munich, Leipzig, Wesel and Bad Honnef were recruited between the end of 1997 and the beginning of 1999. Parents were repeatedly asked about various lifestyle-related factors and disease outcomes. Furthermore, blood tests were carried out at different times. At the age of six a total of 565 children were examined in Leipzig, and for 234 participants, blood analyses regarding stress and immune parameters were carried out. Over the course of the 6-year study nearly one third of the families living in Leipzig were affected by unemployment. For approximately half of all families, severe illnesses were experienced by close family members. By comparison, cases of death among family members or the separation of parents only affected every sixth or tenth child.

Source: Helmholtz Association of German Research Centres

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