Common toxin linked to childhood asthma and allergies

Wheezing and eczema are common during infancy in New Zealand and University of Otago researchers have found that exposure to endotoxin may be one of the reasons.

Endotoxins are produced by the breakdown of bacteria. They can be found everywhere, but house dust typically contains large quantities of these toxins.

The research team at the University's Wellington and Christchurch Schools' of Medicine and Health Sciences (WSMHS & CSMHS) measured levels of endotoxin in the homes of 881 infants. Endotoxin was measured in dust samples taken from the infant's bedroom floor at three months age. Questionnaires at 15 months gathered information on symptoms of wheezing, rhinitis, and itchy scaly rash, while skin prick tests were conducted at 15 months to assess for atopy.

Infants with higher levels of endotoxin in their bedroom had more wheezing and more eczema like rashes.

"This is an interesting result as it shows that endotoxins, which are extremely common in the environment, may be having negative health effects on infants," says lead researcher Julie Gillespie.

Infants with a family history of allergic disease were also found to be more susceptible to endotoxin. Eight out of 10 New Zealand children have a parent who has a history of allergic disease and the study indicates that an increase in the effect of endotoxin may be partly inherited.

The results from this HRC-funded study were published in the December 2006 issue of the *Journal of Allergy and Clinical Immunology*. The research was also supported by the David and Cassie Anderson Bequest.

The findings are part of a wider, collaborative infant cohort study between the Wellington Asthma Research Group based at WSMHS and the Canterbury Respiratory Research Group based at CSMHS.

The group have been following a cohort of 1000 infants from Christchurch and Wellington to examine the various risk factors in the development of asthma and allergies in early life.

The Director of the Wellington group, Professor Julian Crane, says that these latest findings may not be bad news at all.

"There's growing evidence that while endotoxin may cause wheezing by a direct effect on the lung, it may also protect children from developing allergies in later childhood, and thus reduce their risk of allergic asthma," he says.

The group plan to measure the allergic asthma response amongst the cohort at seven years of age.

"At present we just don't know about the longer term impact of endotoxins on asthma. But when we do this planned research, it may help to explain whether or not exposure and reaction to endotoxins in early infancy has a positive or negative effect on the development of asthma," Professor Crane says.

The cohort study has been running since 1997 and it is expected that the findings will provide valuable information to GPs and respiratory physicians in New Zealand as to the key causes of asthma and allergies in young children to help in managing these common diseases.

This research is funded by the Health Research Council of New Zealand and is supported by the David and Cassie Anderson Bequest.

Ms Julie Gillespie

Key words:

- Endotoxin, asthma, allergies

Key facts:

- Eight out of 10 New Zealand children have a parent who has a history of allergic disease
- The highest prevalence of asthma in the world is observed in English speaking countries.

Aims of this research:

- To examine the various risk factors in the development of asthma and allergies in early life
- To help clinicians better manage asthma and allergies in young children.

What this research has found:

- Infants exposed to higher levels of endotoxin had more wheezing and more eczema like rashes
- Infants with a family history of allergic disease were found to be more susceptible to endotoxin
- Endotoxin may protect children from developing allergies (including allergic asthma) in later childhood.

HRC84 2007
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