Children get coughs and colds all the time. But when they don’t get better, is an allergy to blame? These are on the increase – and scientists want to know why. EU-funded researchers have developed new ways to understand allergy, and to improve research, prevention and treatment.

Diagnosis of asthma and other allergies in children is becoming more common in Europe, reports the World Health Organization. Typical symptoms are wheezing, chronic stuffy noses or itchy eyes (rhinoconjunctivitis). This is not just unpleasant for patients – it may need years of treatment. One study estimates that in Europe, the cost of asthma alone is €19.3 billion per year.

The MeDALL project has shed light on why and how young people develop allergies – immune responses to substances that are normally harmless. It identified new ways of classifying allergic reactions, helping researchers find possible influences from genetics, the environment and diet and allowing doctors to better target treatment.

In doing so, the project team opened the way for possible new research. They developed more accurate measurements of antibodies linked to allergic responses and found new antibody-making cells that are specific to certain allergens. The team also built a new questionnaire, harmonising and extending previous questionnaires used to study allergies and their possible causes. The MeDALL questionnaire – available in nine languages – is being used in one US cohort and by the Japan Environment and Children's Study.

"MeDALL helped us understand the concept of allergy correctly," states project coordinator Jean Bousquet of France’s Institut National de la Santé et de la Recherche Medicale (INSERM).

“What we found is of clinical relevance. When someone’s child is diagnosed with an allergy, they have three questions: Is it severe? What is the patient’s future? Is there a treatment?”
Bousquet says that MeDALL’s research helps doctors predict the outcome of an allergy. “This is new and helps parents better support their children.”

Project results

The EU-funded project combined existing study data on over 44,000 children from birth to find patterns in how allergies develop in different people. “We needed this many subjects for the cohort to be statistically powerful,” explains Bousquet.

Project researchers applied traditional statistical models to the MeDALL database, as well as new statistical models being developed to look at allergy as a whole rather than focusing on each disease in isolation. This second approach is known as systems medicine, explains Scientific Coordinator Josep M Antó of Spain’s Centre for Research in Environmental Epidemiology (CREAL).

In particular, the team was looking for additional ways to classify allergic responses by their characteristics, known as phenotypes. Researchers study these to understand the links between allergens and IgEs – a group of antibodies present in allergic people.

New phenotypes emerged that could help predict therapy needs from an early age. Some children, the project found, respond to many allergens and are likely to do so throughout their life. In particular, asthma, eczema and rhinoconjunctivitis are closely interrelated and should be considered together, says Antó.

Another innovative classification of allergens looks at how they enter the body and how people then react. For example, a baker might eat flour in bread and have no reaction but might react strongly if he inhales the flour. This classification gives clues to the mechanisms of allergic reactions.

Results from the project are also helping extend treatment options. The researchers found how to carry out immunotherapy early in life, specifies Bousquet. In addition, the project helped expand Finland’s successful allergy-reduction programme to other parts of the EU.

MedALL published its cohort data in April 2015 and has since shared it with the US’ National Institute of Health. “MedALL was good for the EU’s academic competitiveness,” he adds. “We have a unique birth cohort and have published papers that are generating interest in other parts of the world.”

Several of the project researchers are continuing the hunt for genetic causes of allergy, while others are now scaling up the results of MeDALL looking forward to new projects; AIRWAYS ICP, for example, will aim at reducing the burden of respiratory diseases, particularly on older people.

See also:
CORDIS [4]

Project:
Mechanisms of the Development of ALLergy
Project Acronym:
MEDALL
Project website:


Links
[1]
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