Rash response

PATHOLOGISTS ARE LEADING THE CHARGE TO CORRECT WIDESPREAD MISINFORMATION ABOUT ALLERGY TESTING. **MATT JOHNSON** REPORTS.

"There is at present no government regulation to control the bizarre, unorthodox, controversial or unproven tests that are widely promoted and conducted by non-medical services"
– Dr Karl Baumgart

With a just phone call Dr Dominic Mallon can be on nearly every morning news program in the country. As a clinical immunopathlogist and allergist, he knows Australia is leading many Western countries in the increased rate and severity of allergies.

And people are interested. A recent study published in *The Medical Journal of Australia (2007;186:618–21)* identified a 12-fold increase in demand for consultations related to food allergy over a 12-year period in one private ACT practice that provides about half the territory's non-emergency allergy services.

And from his patients, Dr Mallon is acutely aware that, in this web-connected world, nearly every parent knows about severe allergic reactions and is worried their child will fall victim to a sudden, life-threatening response to an everyday food or product.

As President of the Australasian Society of Clinical Immunology and Allergy (ASCIA), Dr Mallon is also acutely aware that the term 'allergy' is not only widely misunderstood in the community, but also within the medical profession. Without a scientific approach to the disease, literally tens of thousands of people are being exposed to tests, drugs and diets that can not only be expensive and inconvenient, but have not been proven and may even increase the severity of allergic reactions.

Allergies on the march

"The prevalence of food allergies alone has risen by a factor of four in the 10 to 14 age group in the past 10 years," Dr Mallon explains.

"And while that is quite dramatic, it still means only 4–5% of children and 2–3% of adults actually have food allergies."

Dr Mallon's challenge is to walk the fine line between alarmist and scientist to produce a better understanding of allergic diseases.

A large part of the immunopathologist's role is to provide GPs and non-allergy specialists with a framework for accurately assessing allergic disease. Accurate diagnosis of allergies opens up therapeutic options that can be extremely effective, but are useless if applied to the wrong patient.

"A lot of allergy assessment involves correcting misinformation," Dr Mallon says.

"Twenty per cent of people will say they are allergic to food, and we need to help people who have non-allergic adverse reactions to foods understand they probably have an 'intolerance' or 'sensitivity' that can certainly affect their quality of life, while accurately diagnosing the smaller percentage of people who actually do have allergies.

"Many apparent adverse reactions are erroneously attributed to allergy. If we are not able to discriminate between 'adverse reaction', 'intolerance' and 'allergy' we lose the ability to manage adverse reactions to foods appropriately."

While the word 'allergy' can mean many things to the lay person, to Dr Mallon, the diagnosis is critically dependent on identifying the immune response involved.

Our bodies have a multitude of defence mechanisms that protect us from

Peanut panic

Publicity about a number of child deaths from peanut allergies has led to a rise in the number of parents seeking allergy tests for their children. But the results of skin tests for peanut allergy in children can be misleading and can often cause overdiagnosis, according to Australian research published in the *Pediatric Allergy and Immunology journal (2007; 18:231–9)*. The researchers found that a weal size larger than that used to indicate a positive test in many centres around the world was necessary to be predictive of a positive food challenge.

These results came as little surprise to pathologists who, despite valuing skin tests as a part of the diagnosis, generally require a more complete history and challenge test before they recommend any extreme measures to restrict exposure to this common schoolyard food.

Clinical immunopathologists such as Dr Karl Baumgart are also aware that 20% of children with a peanut allergy will outgrow the sensitivity by the age of six, and he warns that any single test on young children is unlikely to provide the complete picture.

"It's called the 'atopic march' and it reflects the maturing of the immune system," he says.

"Infants and young children tend to develop allergies to foods that they will grow out of by four or five years of age, and then during their school years develop sensitivities to inhaled allergens.

"If we test children at different times we expect to get different results and we need to examine their clinical history as well as their test results to make recommendations on treatment."

PHOTO CREDIT: BILLIE FAIRCLOUGH

Allergy symptoms

SYMPTOMS COMMONLY ASSOCIATED WITH ALLERGIES CAN INCLUDE:

- SKIN RASHES, SUCH AS ECZEMA (ATOPIC DERMATITIS) OR HIVES (URTICARIA)
- SWELLING OR ANGIOEDEMA
- HAY FEVER – ALLERGIC RHINITIS
- RED, ITCHY EYES – ALLERGIC CONJUNCTIVITIS
- ASTHMA
- ANAPHYLAXIS – THE MOST SEVERE FORM OF ALLERGIC REACTION. ANAPHYLAXIS CAUSES SERIOUS BREATHING AND CARDIOVASCULAR PROBLEMS AND CAN BE FATAL.

the antigens and allergens we are exposed to every day.

One is the production of antibodies to target antigens once we have been exposed to them. Antigens are generally small proteins that can come in the form of foods, pollens, animal hair or venoms, and the normal response to an antigen coming though the gastrointestinal wall, the lungs or the skin is for T lymphocytes to bind with the antigen and direct B lymphocytes to produce immunoglobulin – or antibodies – against the antigen.

Upon the next exposure to the same antigen, the waiting antibodies trigger an immune response to quickly neutralise the antigen. It takes only a week to produce antibodies against a specific allergen, but

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– Dr Dominic Mallon

in the people who are 'atopic', the antibodies produced are subtly different.

Known as immunoglobulin type E (IgE), these antibodies generate the excessive immune response characteristic of allergies – and rather than protecting the body, the immune reaction actually causes a problem.

The tendency to produce IgE antibodies can be stimulated from both genetic and environmental factors, with environmental factors tending to dominate in infancy when the immune system is still maturing.

True allergic responses can be as minor as a rash or runny nose, as severe as chronic hayfever (rhinitis), asthma, eczema and dermatitis, or ultimately, a life-threatening anaphylactic reaction. All are triggered by IgE antibodies causing the release of excessive amounts of histamine and other immune substances that, in normal levels, help the body respond to the antigen in a controlled manner.

Skin tests helpful

There are three common tests to determine if patients have a hypersensitive IgE response. The first is a skin test where a small droplet of commercially prepared allergen is placed on the forearm. The skin is then pricked with a lancet, allowing the allergen and the immune system to interact.

"Skin tests have proved very safe and reliable," explains Dr David Gillis, a clinical immunologist and immunopathologist at the Institute of Medical and Veterinary Science in Adelaide and a member of the RCPA Immunopathology Advisory Committee.

"You get results in 15 to 20 minutes and you'll leave the specialist's office with pretty precise information about your sensitivities."

Skin tests allow immunopathologists such as Dr Gillis to quickly test for a large range of allergens, even permitting them to test for sensitivities to uncommon foods.

"If someone is sensitive to, say, a rare fruit, we can ask them to bring it to test it and we'll see if they get a result."

But the skin tests aren't perfect, and Dr Gillis says a positive result doesn't necessarily indicate an allergy to the substance tested.

"Skin tests are reliable in identifying triggers, but they're not so reliable in screening, as most people who have positive tests do not have the disease," he explains.

"To have an allergy you need a positive test plus the symptoms of allergy. You have to correlate the history with the symptoms and then look at the test results."

This initial history taking and careful approach is, he says, particularly important in food sensitivities.

Testing blood serum for a specific IgE is usually the second step in identifying allergies or if skin testing is not available.

"Skin testing is more sensitive than blood testing and it covers a wider range of allergens, but serum testing helps when the skin tests and the clinical history don't make sense, or when the patient has, say, widespread eczema, or a history of anaphylactic reactions," Dr Gillis says.

The blood tests for allergy diagnosis (RAST, or allergen-specific IgE) are highly automated and reliable, but various factors can make the results difficult to interpret.

"Some patients with eczema can have very high IgE levels directed against foods without symptoms of food allergy – while other patients can have very low levels of IgE to a particular food on blood testing, yet develop a severe allergic reaction when they eat it," Dr Mallon says.

Cautious interpretation

Measuring the total IgE can help in setting upper and lower levels for individual patients, but Dr Mallon reinforces that results must be interpreted in the context of the patient's symptoms and history.

Then there is the problem of funding.

"Medicare currently provides a rebate for just four allergen tests per patient episode," he says. He argues that this encourages doctors to request RASTs to mixes of allergens in each test to keep the cost to the patient down.

"Restricting the rebate to four has the potential to decrease the sensitivity of the test," he says.

He also suggests that the use of allergen mixes can reflect a lack of confidence in diagnosing allergies among GPs.

"Doctors get a relatively small amount of allergy training during their undergraduate course and because it's a

PHOTO CREDIT: ELIZABETH ADAMS

condition that is managed in primary care and specialist out-patient clinics, they don't get a lot of practical training during their hospital placements.

"Too many doctors have their first exposure to allergy-related problems once they get into general practice, and then they find it's up to 5% of their consultations."

The lack of supervised training in assessing these conditions, he says, results in a lack of confidence in requesting and interpreting allergy tests.

The ultimate challenge

The final recognised method of testing for allergies is to conduct a challenge test. Increasingly being used in diagnosing and assessing food allergies, challenge tests involve giving patients rising amounts of an allergen in an attempt to provoke symptoms.

"Challenge tests are especially useful when there is some doubt about other test results," Dr Mallon says.

"If the patient ascribes symptoms to, say, a type of fish, but their skin and blood tests to that fish were negative, we introduce that allergen in a safe environment to see if we can provoke symptoms."

The certainty that a negative result can provide is a major reason for the increasing appeal of challenge tests.

"Three to five per cent of children are allergic to cow's milk or eggs, but the majority will outgrow this sensitivity. A challenge test can provide parents with an assurance the allergy has been outgrown."

Dr Mallon adds that challenge tests are being used more widely in testing for peanut allergy, which approximately 20% of children will outgrow by the age of six.

These tests should always be conducted in the clinic of a trained specialist, who can immediately provide treatment if a severe reaction occurs, but Dr Gillis agrees that challenge tests are worth conducting.

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Whacky tests abound

The implications of false positive tests have become more serious in recent years as alternative practitioners offer a number of unproven allergy tests. Cytotoxic food testing, kinesiology, Vega testing, electrodermal testing, pulse testing, clot correlation, reflexology and hair analysis are all promoted by various companies, but none of these tests have been scientifically validated and many clinical pathologists feel they are unnecessary, costly and possibly dangerous.

ASCIA (www.allergy.org.au) has a detailed position statement on unorthodox testing.

"There is at present no government regulation to control the bizarre, unorthodox, controversial or unproven tests that are widely promoted and conducted by non-medical services," says Dr Karl Baumgart, Director of Immunology and Molecular Biology at Douglass Hanly Moir Pathology in Sydney.

Dr Baumgart is also a consultant physician in clinical immunology and allergy, and in his practice he regularly sees patients who have spent hundreds of dollars on tests, only to be misdiagnosed.

"These tests are promoted by well-resourced companies and despite there being no evidence to support the tests, they are very expensive," he says, pointing out that they can cost thousands but are not rebatable.

"These tests exploit patients, confuse the diagnosis and can result in people embarking on treatments or diets they might not need."

Allergy specialists such as Dr Baumgart are concerned about these tests because there are effective treatments for a number of allergies, provided they are correctly diagnosed.

Avoiding the allergen is not difficult if it has been correctly identified as a particular food or pet hair, but is virtually impossible if the allergen is a seasonal grass pollen. Over-the-counter medications such as corticosteroid nasal sprays or antihistamines can control minor reactions, but more serious reactions may need immunotherapy.

For really serious cases

Allergen-specific immunotherapy involves subcutaneous injections of increasing doses of an allergen until the patient achieves a tolerance. Immunotherapy has proved especially effective in patients allergic to insect venoms, with 80–90% of cases successfully desensitised.

It has also proved effective for seasonal allergic rhinitis caused by grass pollens, with some studies showing a 60% reduction in symptoms.

Recent trials examining the effectiveness of sublingual immunotherapy have confirmed its safety and efficacy, and this delivery method may prove more acceptable to patients and parents than subcutaneous immunotherapy.

Researchers are also working on allergy 'vaccines' and other means of interrupting or targeting the mechanics of the allergic response. This work has shown a great deal of promise, but even when it does become available, its ability to provide effective relief to allergy sufferers will rely upon an accurate clinical picture and the use of reliable and proven pathology tests.

GPs NOTE: This article is available for patients at http://pathway.rcpa.edu.au

Can allergies be prevented?

EVERY PARENT WANTS TO KNOW IF THERE IS SOMETHING THEY CAN DO TO REDUCE THE CHANCES OF THEIR CHILD DEVELOPING ALLERGIES. THERE ARE NO PROVEN PREVENTIVE THERAPIES BUT ALLERGY SPECIALISTS DO RECOMMEND THE FOLLOWING, ESPECIALLY IN CHILDREN BORN TO HIGH-RISK FAMILIES:

- EXCLUSIVE BREASTFEEDING TO 4–6 MONTHS OF AGE
- USE OF HYDROLYSED MILK FORMULAS FOR BABIES UNABLE TO BE BREASTFED
- NO EXPOSURE TO CIGARETTE SMOKE.