Conventional allergy tests

Three common problems are whether symptoms are related to allergen exposure, whether a condition will improve if allergens are avoided, and the identification of which allergen (if any) was responsible for a specific exacerbation or adverse event. Are allergy tests any use?

Skin prick tests

The principle of prick tests is that the weal and flare reaction to an allergen introduced into the skin demonstrates the presence of mast cell fixed antibody, mainly IgE antibody.[1] Major problems include:

- A lack of agreed definition as to what constitutes a positive reaction[2]
- Positive tests in subjects without symptoms[2-5] (a few with positive skin prick tests do develop symptoms later, but as the test cannot identify this subset such information is of little value)
- Positive tests persisting after a child has grown out of allergy[6]
- Negative tests in some patients with genuine allergies—for example, up to 17% of patients with pollen induced rhinitis or asthma[7 8]
- The fact that prick tests fail to detect non-IgE mediated allergic reactions—for example, some reactions to cows' milk protein[9]
- Differing potency of allergen extracts[1 10]
- Errors due to poor technique, through delegation to untrained staff, the use of non-standard (for example, hypodermic) needles, or placing tests too close together (resulting in non-specific weal reactions).

Intradermal testing

Intradermal tests, which carry a small risk of fatal anaphylaxis, are far more sensitive than skin prick testing,[1] and hence produce more false positive reactions.[5 11]

Serum IgE antibody concentration

There are a number of laboratory methods, of which the best known is the radioallergosorbent (RAST) test.[10] Serum IgE assays are slightly less sensitive than prick testing, but clinical interpretation of results is subject to the same caveats and pitfalls as prick testing.[10] Unlike prick tests they can be informative where antihistamines cannot be discontinued, in the presence of dermographism, or with widespread atopic eczema.

Challenge tests

(A) INHALATIONAL

The aim is to provoke symptoms directly by delivering an allergen direct to a target organ (for example, lung or nasal mucosa). Difficulties include:

- Dose (high doses may give false positive result[1])
- Problems with particle size (for example, pollen grains may fail to cause bronchoconstriction because the grains (20 to 30 μm) are trapped in the nose and do not reach the bronchi; on the other hand, pollen extract (1 to 2 μm droplets) can give bronchoconstriction even in hay fever patients who are never troubled by asthma in the pollen season)
- The laboratory conditions may fail to replicate natural exposure—a provocation test may expose the airway to a total allergen dose which corresponds to exposure for days or weeks during the pollen season[1]
- Result may depend on non-specific reactivity reflecting the state of the underlying disease.

(B) BY INGESTION

As the end points are often less clear cut, food challenges may need to be performed double blind.[12] In practice there are a number of difficulties:

- Observation needs to be long enough to detect delayed reactions (up to 48 hours or more after ingestion[13])
- Standard methods with encapsulated dried foods (up to 500 mg per capsule) may not deliver an adequate dose; in some cases of food intolerance reactions occur only with larger doses[13]
- The state of the food may be important, with reactions occurring only to either the raw or to the cooked form[14]
- A challenge performed during a quiescent phase of the disease may fail to provoke an adverse reaction[14]
- Some adverse reactions occur only in the presence of other factors (for example, after exercise, after taking aspirin, or in the presence of other allergens) which if omitted result in a false negative test.[14]

Value of allergy tests

Tests for specific IgE antibodies, whether in the skin or the circulation, are of doubtful use, mainly because of the large number of false positive and false negative results. Textbooks acknowledge that test results can be interpreted only in the light of the history,[5] yet it is illogical to accept a result only if it fits with the history. Inhalational provocation tests are not generally available and are mainly of use as a research tool. The best approach is a careful history to look for clues to specific allergens, and trials of empirical avoidance measures where the condition is not easily controlled with simpler measures.

Food intolerance can be due to a number of mechanisms, only some of which are immunologically mediated. Skin and RAST tests are thus predictably unhelpful, with negative results in those with non-IgE mediated disease[9] and a large number of false positive results, including subjects who have outgrown their intolerance.[6] Subject to a number of limitations,[14] double blind challenges are a useful research tool. In routine practice, avoidance of items chosen from the history or from knowledge of frequent offenders,[15] followed by relapse after open challenge, is often sufficient intervention.

Conclusion

Until tests for IgE antibodies, whether in skin or blood, can be validated in clinical practice, their use is difficult to justify except as a placebo investigation or as a research tool; a trial of antigen avoidance is the most logical approach. The diagnosis of food intolerance is complicated by its heterogeneous nature, and a trial of avoidance followed by food challenge is the best available method. The lack of reliable conventional allergy tests is one reason for the current popularity of more unorthodox approaches.[16]

T J DAVID

Booth Hall Children's Hospital,
Charlestown Road,
Blackley,
Manchester M9 2AA

1 Dreborg S, ed. Skin tests used in type I allergy testing. Position paper. Prepared by the sub-committee on skin tests of the European Academy of Allergology and Clinical Immunology. *Allergy* 1989;**44**(suppl 10):1–59.
2 Lessof MH, Buisseret PD, Merrett J, Merrett TG, Wraith DG. Assessing the value of skin prick tests. *Clin Allergy* 1980;**10**:115–20.
3 Curran WS, Goldman G. The incidence of immediately reacting allergy skin tests in a 'normal' adult population. *Ann Intern Med* 1961;**55**:777–83.
4 Fontana VJ, Wittig H, Holt LE. Observations on the specificity of the skin test. The incidence of positive skin tests in allergic and nonallergic children. *Journal of Allergy* 1963;**34**:348–53.
5 Bousquet J. In vivo methods for study of allergy: skin tests, techniques, and interpretation. In: Middleton E, Reed CE, Ellis EF, Adkinson NF, Yunginger JW, eds. *Allergy. Principles and practice*. 3rd Ed, Vol 1. St Louis: Mosby, 1988:419–36.
6 Ford RPK, Taylor B. Natural history of egg hypersensitivity. *Arch Dis Child* 1982;**57**:649–52.
7 Eriksson NE. Diagnosis of reaginic allergy with house dust, animal dander and pollen allergens. II. A comparison between skin tests and provocation tests. *Int Arch Allergy Appl Immunol* 1977;**53**:341–8.
8 Pepys J. Skin testing. *Br J Hosp Med* 1975;**14**:412–7.
9 Hill DJ, Duke AM, Hosking CS, Hudson IL. Clinical manifestations of cows' milk allergy in childhood. II. The diagnostic value of skin tests and RAST. *Clin Allergy* 1988;**18**:481–90.
10 Bernstein IL, ed. Proceedings of the task force on guidelines for standardizing old and new technologies used for the diagnosis and treatment of allergic diseases. *J Allergy Clin Immunol* 1988;**82**:487–526.
11 Reddy PM, Nagaya H, Pascual HC, *et al*. Reappraisal of intracutaneous tests in the diagnosis of reaginic allergy. *J Allergy Clin Immunol* 1978;**61**:36–41.
12 Bock SA, Sampson HA, Atkins FM, *et al*. Double-blind, placebo-controlled food challenge (DBPCFC) as an office procedure: a manual. *J Allergy Clin Immunol* 1988;**82**:986–97.
13 Hill DJ, Ball G, Hosking CS. Clinical manifestations of cows' milk allergy in childhood. I. Associations with in-vitro cellular immune responses. *Clin Allergy* 1988;**18**:469–79.
14 David TJ. Hazards of challenge tests in atopic dermatitis. *Allergy* 1989; suppl **9**:101–7.
15 David TJ. Dietary treatment of atopic eczema. *Arch Dis Child* 1989;**64**:1506–9.
16 David TJ. Unorthodox allergy procedures. *Arch Dis Child* 1987;**62**:1060–2.

Job sharing

Despite being a relatively new concept in medicine, job sharing provides an ideal solution for men and women who need to train and work part time in order to combine domestic commitments with the continuity of a career.[1] Clearly an openness to new concepts in employment will be increasingly necessary if highly qualified and experienced staff are to be attracted to stay in busy hospital specialties, particularly as nearly 50% of medical graduates are now women. Successful job sharing schemes have been undertaken in all post-registration hospital grades, general practice, nursing, and management.[2–9]

The table shows the numbers of hospital doctors in paediatrics who work on a full or part time basis. Of these, only four pairs have shared posts to our knowledge.

There are three ways in which part time posts may be created. The first is the conversion of an existing full time post to part time, this being rarely acceptable to the service or to colleagues. Secondly, supernumerary part time posts can be arranged with the help of regional postgraduate deans. At senior registrar level candidates apply for the PM(79)3 scheme[10] which has been in progress for 10 years. Training application having been approved by the regional postgraduate dean, the candidate is referred to a national appointments committee, short listed, and then required to attend for interview, held only once a year. At present there are fewer than 10 posts in paediatrics annually appointed on the PM79(3) scheme, and regional funding is not always available for successful candidates. This scheme is of no help to those seeking part time consultant appointments. The third option, and the subject of this annotation, is to share a full time post.

The advantages of job sharing include the opportunity of applying for full time posts thus increasing the choice of jobs available. Having two sets of experience and background brings a broader base to patient management. There is greater flexibility in duty rostering. Shorter breaks in cover occur due to holiday or sickness, as the other sharer is there at least half of the week. The unexpected bonus to the sharing of problems and management is the reduction of the stress of uncertainties and in the feelings of isolation so often encountered in clinical practice.

Paediatric hospital doctors including paediatric neurology, DHSS review (England and Wales) 1987

Grade	*No of doctors*	*Whole time*		*Part time (%)*	
		Men	*Women*	*Men*	*Women*
Registrar	303	159	92	3 (1)	13 (4)
Senior registrar	171	64	25	0	18 (11)
Consultant	675	390	104	58 (9)	33 (5)

There are some potential problems. Both candidates must be first choice at the job interview in order to be competitive. Different backgrounds could lead to a potential difference in time to accreditation or retirement. Unlike the PM (79)3 scheme for higher specialist training the post is not designed specifically for the individual. Incompatibility is minimised by a joint commitment to making the job share work.

The administrative details of job sharing are easily manageable. The contract essentially means that working hours, pay, and holidays are divided equally. With the Pay As You Earn system, deductions for national insurance and superannuation are made as a straightforward percentage. The cost to the hospital is the same for two job sharers as for one person. If one person leaves the other is still under contract. The remaining partner may choose to take up the post full time, to work with a further part time replacement, or alternatively resign. A significant security came about in November 1988 when the Medical Manpower and Education Division of the Department of Health and Social Security confirmed that at senior registrar level, job sharers are considered eligible for the PM(79)3 scheme in the event of the job share breaking down (personal communication).

The keys to a successful job share partnership are mutual trust, loyalty, flexibility, and a commitment to each other as well as to excellent patient care and specialist training. Impeccable handovers are vital and must cover all responsibilities of the job. Optimal handovers should be in both verbal and written formats. Clear and full completion of patient casenotes provides clarity both for the job sharer and other medical colleagues. Outpatient follow up appointments can be calculated to provide continuity of care with the respective sharer. Handovers should include particular mention of problem outpatients. Availability by telephone is helpful and we spend approximately one hour a week in such discussion. Due consideration must be given to the division of the working week. For junior staff, a block of work may give better continuity of care for inpatients and reduces the handover exercise to once a week. Other staff, including switchboard operators, need to know clear details of the working arrangement. A shared bleep may simplify communications. The on call commitment is normally split, each job sharer working half the on call of full time colleagues. An informal agreement to cover each other's