

The Importance of Epidemiological Studies of Allergy in Asia and the Pacific

The presence of circulating IgE antibodies, specific to commonly inhaled and ingested allergens, is called atopy and can be detected simply by using skin prick tests as described by Pepys.¹ These tests are safe, simple, rapidly performed and when properly executed give an accurate reflection of the atopic status of the subject.² Patients with diseases commonly called "allergic" (which include asthma, allergic rhinitis, atopic dermatitis and anaphylactic reactions to drugs, foods or insect stings) usually have increased levels of IgE specific to one or more common allergens. It is now known that many adults and children have atopy (one or more positive skin prick tests) but that only a proportion of them have any of the aforementioned diseases.³⁻⁵

The prevalence of atopy in different populations and the effects of age, occupation, area of dwelling, smoking and other variables are poorly defined for all populations. Furthermore, the prevalence of the diseases in which allergic status seems to be important is also poorly documented. Gregg⁶ has reviewed the literature for asthma and, although it is difficult to compare studies because of differences in definition and method, it is clear that asthma is common in Australia and New Zealand but uncommon in most countries of Southeast Asia. However, there are several populations living in the Western Pacific

region with an exceptionally high prevalence of asthma. Firstly, a high prevalence of asthma has been found among a very small population living in an area of the Eastern Highlands of Papua New Guinea, while in surrounding areas, the prevalence is extremely low.⁷ Secondly, Brown *et al*⁸ have reported an astonishingly high prevalence of asthma among people living on some of the islands of Micronesia. Thirdly, there is a high prevalence among the Tokelauan islanders in the New Hebrides chain.⁹

Thus, although asthma seems to be rare or absent in most village communities in Southeast Asia and the Western Pacific, there is a high prevalence in some specific communities. The prevalence of allergic rhinitis, eczema and other allergic diseases has not been documented in the countries of this region.

For a long time, various people have suggested that the presence of parasites may play a role in the control of atopy and also in the development of allergic diseases.¹⁰ The possible relationship between parasitic infestations and allergic diseases has recently been reviewed^{11,12} and it is clear that there are still insufficient studies to decide the role, if any, of these infections in either protecting against or predisposing people to allergic diseases.

Many questions remain which, with our scanty knowledge, we are

unable to answer. What are the causes of the difference in prevalence of asthma between populations in this region? Is asthma increasing in the region? How are atopy and asthma related? Do parasitic infections protect against atopy and asthma and, if so, under what circumstances? Is asthma a serious health problem? Are the people who have asthma receiving appropriate treatment? Most importantly, what clues can we gain about the nature and causes both of atopy and of asthma from simple, well-planned studies?

It is difficult for members of medical faculties in most Asian and Pacific countries to do the sophisticated research which is undertaken in the United States of America. However, epidemiological studies of the prevalence and nature of skin test reactions (using the prick method) to common allergens and the prevalence of the allergen-related diseases in populations of children and adults, living in urban, semi-urban and rural communities, are very much needed.

What are the problems involved in undertaking such studies? The first problem is to decide which allergens should be used for the skin tests. It is now clear that in all parts of the world where there is humidity for the greater part of the year, house-dust mites (*Dermatophagoides pteronyssinus* and *D. farinae*) are the dominant allergens.

The exception to this may be the absence of a suitable medium, such as house-dust, in which the mites can survive. If, for example, the floors of houses contain other predatory mites or insects, insufficient numbers of the allergenic mites may accumulate to form an allergen pool.

Our studies in the coastal areas of Australia, Papua New Guinea and Indonesia have shown that more than 90 per cent of the atopic population react to one or both of these mites and thus, mite extracts alone can be used to document the prevalence and, to some extent, the severity of atopy. It is, however, important to use a negative control (glycerol saline) and a positive control (histamine).

If information about the common allergens causing an IgE response in the population is required, it is usual to include two allergens from animals to which the population is exposed (e.g. dogs and cats), two moulds (e.g. *Aspergillus* and either *Alternaria* or *Cladosporium*), two grass pollens and two weed pollens. In addition, the substance used most often to stuff pillows (feathers or kapok) should be included. The allergens should be of the highest quality possible and obtained from a reliable manufacturer in the U.S.A. or in Europe. An international programme has started to produce reference allergens for skin testing but supplies of the reference allergens are not yet freely available.

The second problem for good studies is that of sampling. Representative populations are needed, it is not sufficient to study only the people who attend clinics. In most countries it is easy to study children of school age but it is important to identify and study those children who, for one reason or another, do not attend school. There is probably an increasing prevalence of atopy from birth until the age of 10 to 12 years in most populations. It is more difficult to obtain representative samples of

adults. The easiest way is to study all the members of a village of appropriate size. In urban communities it is necessary to select representative racial groups or to find a method of obtaining random samples of the population.

The third problem is the definition of the diseases to be studied. In Australia and New Zealand, asthma is by far the most important of the allergen-related diseases although frequently asthmatics are not allergic. We have defined asthma as the presence of intermittent symptoms (wheezing, tightness in the chest, or dry cough at night) together with documented bronchial hyper-responsiveness which in turn is defined as a greater than 20 per cent response in the one second forced expiratory volume (FEV_1) to either a bronchodilator (200 μ g salbutamol) or to a bronchoconstrictor (8 μ M or less of histamine or methacholine).

This definition requires a reasonable degree of sophistication and the apparatus to undertake the tests of bronchial responsiveness. These tests have been greatly simplified¹³ and should be used if possible in studies of the prevalence of asthma. However, if this is not possible, a questionnaire alone can be used. This should be extremely simple. Questions should be asked about wheeze, chest tightness, dry cough at night (questions about breathlessness are best avoided because asthmatic patients rarely have breathlessness without one or more of the other symptoms and many patients with chronic lung disease have breathlessness), about the time of the last attack, the known factors (if any) which precipitate attacks and the treatment (if any). The subject can also be asked about nasal symptoms, eczema and reactions to drugs or insect stings. It is possible to use fewer than 10 questions and obtain a very good idea of the allergen-related diseases in a community.

The fourth problem is to obtain the materials needed to do the

study and to train the staff. In practice, all the methods used are very simple, the allergens being the most expensive. However, for skin prick tests only very tiny drops are required and 1.0 ml is sufficient for several hundred tests if it is used carefully. Since all the methods are simple, highly trained staff are not required; they must, however, be diligent and thorough in their tasks.

The final problem is the collation, analysis and publication of the results. This too can be a very simple task. Sophisticated computers are not necessary although there are many cheap microcomputers which can be used to type in the data and to make simple analyses.

The Respiratory Disease Committee of the International Union Against Tuberculosis is presently designing and testing some simple protocols for documenting the prevalences of atopy and asthma (a questionnaire, a simple method for measuring bronchial responsiveness and a protocol for skin tests) in different populations. These protocols will be published shortly, enabling investigators from many countries to start to collect this badly needed data.

The aim of this editorial is to stress the importance of undertaking studies, both in the region of Southeast Asia and the Western Pacific, of the prevalence of atopy and of the allergen-related diseases. While it is possible to do these studies with very little equipment, thorough initial planning of each study is essential. With the increased knowledge that will result from them, individual countries will be able to define better their particular problems of allergen-related diseases. This should lead to better treatment and give new clues about the nature and cause of atopy and the diseases related to allergy.

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