

Therapeutic Allergen Vaccine: Is It the Ultimate Solution?

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Allergic rhinitis is surprisingly modern. Very rare descriptions can be traced back to Islamic texts of the 9th century and European texts of the 16th century. It was only in the early 19th century that the disease was described in detail and at that time was regarded as the most unusual ailment and only occurred in the well-to-do people. By the end of the 19th century, it had become common in both Europe and North America¹. In England, the number of patients, children and adults, seen by primary care doctors with the diagnosis of hay fever had more than doubled from 1100 patients in 1971 to 2830 patients in 1991 (a rise of 260%). In contrary, the number of patients during the same period of time seen for urticaria had not increased (840 patients V.S. 710 patients)². This result is not unexpected since chronic urticaria is usually not an allergic disease. In Thailand, the prevalence of allergic rhinitis, asthma, and eczema were increasing significantly in children from 1995 to 2001 (37.9% VS 57.6%, 12.2% VS 14.5%, and 9.8% VS 15.6% respectively) from the ISAAC I and III studies³. In adult, the prevalence of allergic rhinitis in U.K. and France are at 26% and 25% respectively. Locally, the prevalence of allergic rhinitis and asthma in university students in Bangkok had risen from 24% to 42% and 2% to 10% respectively⁴ making allergic diseases as one of the common chronic diseases among Thais.

At present, there are about 18 million Thais afflicted by allergic rhinitis and asthma, which results in soaring medical costs. There is little doubt that the cause of this increased prevalence of allergic diseases is multifactorial, although the allergen exposure is almost certainly necessary for their development. We know that dust mite is a major allergen sensitizer in most part of the world including Thailand⁵. As early as 1970, dust mite was proposed to be the cause of asthma in Thailand and the dust mite population in

Bangkok was noted to be quite high when compared to many other provinces^{6,7}. Subsequent study showed that the highest density of dust mite in house dust was from the northern part of Thailand⁸. There seems to be a dose response relationship between dust mite sensitization, specific IgE levels, and the occurrence of allergic rhinitis, which then can progress to asthma. This relationship was demonstrated when T cells of these patients were stimulated with Der p1 allergen⁹. So far, we have no evidence that tolerance to dust mite allergen can develop after prolonged exposure, in contrary to a recent report suggesting that tolerance to cat allergen may develop after prolonged cat exposure¹⁰.

Beside environmental control and medication therapy for allergic rhinitis, allergen vaccination is a very effective treatment option. In allergic children, allergy vaccination can prevent new sensitizations and stop the progression of allergic rhinitis to allergic asthma^{11,12}. The clinical benefits of allergy vaccination may be long lasting even after cessation of the vaccination. Hence, allergy vaccination may be more economical for treating allergic rhinitis and asthma when compared to medication therapy. The effectiveness of allergen vaccination is mediated through the production of IL-10 and TGF- β by the T regulatory cell when vaccine is introduced and later presented by the antigen presenting cells, which then tilts the immune phenotype from Th-2 toward Th-1¹³.

In conclusion, the prevalence of allergic rhinitis and asthma is increasing. These allergic diseases require accurate diagnosis with allergy skin testing for proper treatment and management such as an environmental control. Medication therapy can be costly since these are chronic diseases and, as with dust mite sensitizer, probably will not have spontaneous remission. Allergen vaccination by either subcutaneous or sublingual route is an attractive treatment since it is probably less expensive and may stop the disease progression in children, and have the potential of putting these diseases in remission.

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