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Allergy in childhood

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Allergic rhinitis, the most common otorhinolaryngological allergic manifestation in childhood, is a world widespread disease and recent studies carried out in Poland, Greece and Italy have shown that between 5 and 10% of the population, especially children and adolescents is affected. This is in agreement with data found for the U.S.A. by Broder (1974), Jones (1978) and Fireman (1983).

Church (1980) reported on the studies carried out by Maternowski and Magy, who found allergic rhinitis in 20% of the pediatric population. In Italy allergic rhinitis is present in 16% of the children. One of our recent studies has been carried out on 1620 children attending seven state schools, namely four elementary schools and three junior high schools, located in different quarters of Rome and its province. The seven schools have been chosen at some distance from each other in order to be able to examine students who were subjected to different allergenic stimuli at different times and ways during the school-year. We distributed questionnaires among the parents and by analysing the answers we found that in 23% of the children an allergological risk was present. Therefore these children are potential allergic patients.

In 1979 Holopainen found after examining 770 allergic children that 32% was sensitive to Graminaceae, 44% to house dust, 90% to moulds, and 15% to animal dander. Our findings are quite similar because we found that 36% of our allergic subjects was sensitive to Graminaceae, 12.5% to Parietaria officinalis and 33% to Dermatophagoides. The allergenic influence of food ingredients on the respiratory tract is still a matter of debate but, in our opinion, these allergens should not be ignored, particularly in children.

Allergic rhinitis is the most widespread allergic disease in childhood and because it does not cause any severe complaints or handicaps, it is often not recognized by the parents and, consequently, by the physicians. A thorough investigation of this disease would cause an increase of its statistical prevalence and thus allergic rhinitis become of more importance. This has already been illustrated by Fireman (1983), who described in his report that 20 million people in the U.S.A. suffer from allergic rhinitis. This causes a high non-attendance rate at work and at school which consequently means a great economic loss.

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Furthermore, we should not forget the evident fact that in modern life it is easier to come into contact with air pollution and also with various allergens. Thus it is not surprising that an increase in prevalence of allergic rhinitis can be found in economically well-advanced countries. Other important factors are: the inhalation of cosmetic vapours, cigarette smoke, psychological and even physical stress, long hospitalization, particularly for the young patients, anaesthesia induction and idiopathic deficiency of oligoelements.

In this paper I want to focus on those aspects that in my opinion are of importance in the diagnosis of allergic rhinitis in childhood. The patient's family history, especially the previous two or three generations, is the first relevant factor that must be considered. In fact, in the case of allergic rhinitis it is not the disease that is inherited but the inclination to suffer from it. However, there may be generations that, although susceptible to the disease, do not show any symptom or sign of the disease itself. The physical examination, especially of the colour of the nasal mucosa, provides us with more information about the disease. The modern technology supplies the rhinologist with equipment that must be used in studying the disease. Then an assay of immunoglobulins in the nasal secretion must be carried out. The rate of immunoglobulins in the nasal secretion varies under physiological conditions according to a circardian cycle, as described by Harada et al. (1984).

In the literature various methods for collection of nasal secretions are described. We use Loren's method, modified by Mygind and Thomsen (1975), but instead of blotting paper we use cotton wool. The cotton wool is inserted between the middle turbinate and the nasal septum and after 15 minutes it is withdrawn and squeezed. The quantity of secretion collected is small but sufficient for examination on tripartigen plates or with turbidimetry. Rhinomanometry measures the conductance and thereby quantifies the ventilatory ability of the nose. This examination is carried out by means of an appropriate programme inserted in an Apple II computer and in this way we are able to point out even the slightest alteration. The mucociliary transport test is of extreme importance because it provides us with information such as slight changes of the nasal mucosa and the various components of the nasal mucus. After having used most of the methods described in the literature, we are now using a mixture of vegetal coal and 1% saccharine. The first component eliminates the justified criticism on soluble tracers, the second is added as a subjective parameter. Coal can be easily identified, is not toxic, is cheap and the transport time in the nose is similar to that of labelled tracers and radiopaque discs. Moreover it does not require expensive and rarely used equipment.

Finally, we should briefly mention the nasal provocation test (NPT) that evaluates the changes in the nose induced by the local administration of an allergen. Although the test is criticized by American authors, it is of interest to those inves-

tigators who try to improve it by changing the method. The major obstacles in clinical practice are: the difficulty to quantify the exact dosage of the allergen, the determination of the threshold dose and the difficulty of obtaining a reliable parameter. Various parameters have been described such as eosinophilia of the nasal secretion, the appearance of one or more symptoms or clinical signs and an asthmatic-like reaction. However, these methods depend on the subjective assessment of the results by either one examiner or the patient and are, therefore, unreliable.

We prefer rhinorheomanometry, a rapid and simple method, easily applicable in children. In our Institute we use aqueous solutions of semipurified allergens or commercial allergenic extracts prepared in phosphate buffer and commercially available at a concentration of 5, 10, 20, 30, 50 U.A. of antigen in each sprayed dose. The examination is carried out after having tested the conductance of both sides of the nose. We choose the side of the nose with the best conductance and administer the solvent only. After 10 minutes we measure the conductance of the tested side and the value obtained was considered as basic value. Then, the same side is stimulated with 5 U.A. of allergen. If an evident response does not appear within 30 minutes we repeat the stimulation with 10 U.A. and, if necessary with 20, 30 and 50 U.A., always at 30 minutes intervals. The test is stopped when a 50% reduction of conductance is obtained. If this reduction is not present at a dose of 50 U.A. the test is considered negative. In this way the NPT can be used for the diagnosis of atopy and of nasal allergy. In our opinion, this test should routinely be performed in allergological-risk subjects, in skin-negative rhinopathics or at least in skin-positive rhinopathics who do not show clinical improvement following the therapy.

We believe that the NPT should be considered more sensitive than skin tests during the asymptomatic stage of the diseases. In case of a positive skin reaction it is a valid method used to determine the degree of the allergy. The choice to use a skin test or a RAST depends on the experience of the allergologist. However, these tests are positive when the allergic condition has already caused a generalized reactivity and thus by using these tests organ allergies are overlooked.

Many authors have pointed out that the therapy of allergic rhinopathy, like the therapy of allergy in general, should consist of three fundamental stages: 1. the identification and the removal of the offending allergen; 2. the treatment with aspecific drugs; 3. the specific desensitizing immunotherapy. It is clear that the first step is fundamental although difficult to fulfill. With regard to the pharmacological therapy we are of the opinion that the benificial effects of beclomethasone can be obtained without the systemic effects that are found when corticosteroids are used. Disodiumcromoglycate is another extremely useful drug as has been pointed out by Mygind (1978) and many others. Its specific quantity seems to be

the inhibition of the degranulation of mast cells by influencing the permeability of the membrane to calcium ions or the inhibition of phosphodiesterases which activate cAMP, as was recently described by Van Cauwenberge (1984).

Specific immunotherapy should be applied only in case the results of the above mentioned drugs are disappointing. In 1955 Swineford suggested to use the topical administration instead of the subcutaneous way of vaccination. It is obvious that the topical administration is more acceptable in children. For this reason we have been using this method for the last eight years in the treatment of children with Graminaceae allergy. We chose this type of allergy because it occurs in certain specific periods of the year and is, therefore, easy to investigate. However we have now expanded our study with other agents. The vaccins are prepared by diluting commercially available preparations with a physiologic solution; the administration is checked by vapourizers with a constant dose. For each patient the quantity of vaccin, initially administered, is determined by increasing the dose of the allergen until a 50% reduction of the nasal conductance is reached. This initial dose is administered into each nostril three times a week, for a period of four weeks.

Then the quantity of allergen is increased, according to the progression 50, 100, 200 and 500 PNU administering for four weeks the dosage immediately successive to the initial one and finally for six weeks the following doses. The maximum dosage is administered until a few weeks before the beginning of the flowering-period. Naturally, the progression of the dosage is decreased when an allergic symptomatology is found. During the flowering-period it is advisable to administer the standard dose of 100 PNU; the successive dosage will include an increase analogous to the previous one. With this therapeutic scheme the chance of an allergic microcrisis is minimal. The results obtained confirm that topical specific immunotherapy protects from seasonal crises. Moreover in most patients blocking antibodies and secretory immunoglobulins were found.

From the study of the symptom scores and rhinorheomanometry we can conclude that the nasal patency remained sufficient during one critical period even in cases of severe allergy. Although our investigation is performed in patients with Graminaceae allergy only we recommend this topical way of vaccination, because the results are not only similar to those obtained by subcutaneous vaccination, but also because this method is more acceptable to young children and their parents.

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