House-dust mite nasal allergy

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SUMMARY

Dermatophagoides pteronissimus, the mite which can most frequently be isolated from house-dust, appears to be the main responsible agent of perennial respiratory allergy in our climate. Mite allergy can be observed especially in children and young adults; in two thirds of the cases it causes nasal or nasal-bronchial disturbances, and asthmatic trouble in one third only. The frequency of sinus lesions, both multiple and intense, is very high. Response to specific therapy, when a total dose of at least 40.000 NPU is reached, is in most cases good, with a fair correlation between the increase of the specific blocking antibodies of the serum and the symptomology.

THE complex problem of nasal allergy to house-dust has been greatly clarified since the discovery of a frequent identity between house-dust allergens and those of certain mites which are often present in it (Voorhorst and al., 1967). As we know to-day, (Voorhorst and al., 1967; Maunsell and al., 1968), the mites which can generally be isolated are the Dermatophagoides pteronissimus (D.pt.) and the Dermatophagoides farinae.. The former, which is by far the more frequent, appears to find the ideal micro-climate for development, and its best nourishment, which consists of epidermic human derivatives, in and around the bed and bed-clothes, especially in relatively very damp regions, and in autumn. Although the human sensibilization by D.pt.) and its derivatives has been known for a long time (Storm van Leeuwen and al., 1925) it is only recently that knowledge of its ecology, isolation and culture (cf. Maunsell and al., 1968) and of its allergenic pattern (cf Biliotti and al., 1972) has made possible a rational specific therapy.

Our preliminary studies (Crifò and al., 1973) indicated that sensitivity to D.pt. was probably the most important cause of perennial nasal allergy, at any rate in Italy, and that it was frequently accompanied by sinus lesions. The present article gives the results of a vaster study whose purpose was a more precise characterization of this important frequent rhino-sinusal allergy.

Materials and methods

The patients with nasal and/or bronchial allergy due exclusively by D.pt. or also associated allergens were selected among all those identified in our Center be-

tween September 1972 and April 1974 by means of scarification and/or intradermal tests. Standard doses of specific commercial diagnostical extracts (Lofarma, Milan, Italy) were used. In all cases skin-positivity was confirmed and evaluated by finding the end-point of a series of 1/5 dilutions of the allergen(s) (0,16 NPU/ml - 100 NPU/ml.) Before treatment, and by means of the K. Maunsell test (1946), we also evaluated the level of the specific blocking antibodies of the serum which each patient could have acquired spontaneously. The comparative analysis of the data reported in the files of the D.pt.-positives and of perennial nasal and/or bronchial Parietaria officinalis-allergics (see Crifò, 1969) revealed the nosological differences between the two forms.

Finally, the effects of the pre-established total hyposensibilizing doses achieved gradually with specific hydroglyceric extracts in the two groups of patients were evaluated on the basis of the count drawn from the symptomologic diary kept by each patient and of the increase of the blocking antibodies as revealed by the simplified Maunsell'test (Munro-Ashman and al. 1971).

RESULTS

In our Center for N.E.T. allergic and immunologic diseases, 278 patients with respiratory allergy have been identified and studied in the last thirthy months. Or these, 105 cases (37,7%) proved skin-positive to D.pt. ,of which again 69 (24,8%) to mite alone and 36 (12,9%) to other inhalants as well (10 cases) or pollen (24 cases). The entire group of patients included 35 cases (12,5%) of allergics to Parietaria officinalis (P.O.) which is very frequent pollen in our climate. The following results are derived from the comparison between the group of patients who were skin-positive do D.pt. alone and that of the persons

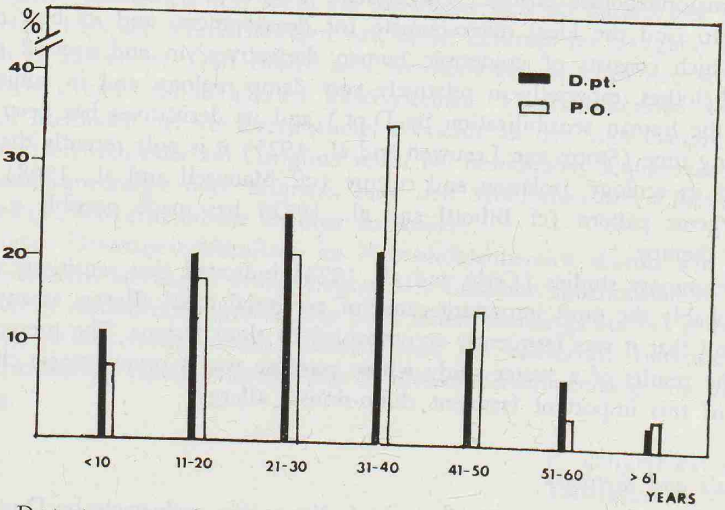

Figure 1. D.pt.-atopy proved more frequent in the first three decades, whereas P.O.-atopy was more frequent in 2nd to the 4th decade of life.

who were skin-positive to P.O. In comparing these two forms of perennial allergy, we took into account a great many anamnestic symptomatologic and objective data, but here we will report only those which showed obvious differences.

Age. Perennial respiratory allergy due to both D.pt. and P.O. has been observed by us in people of all ages, from 4 to 67, but the percentage of D.pt. atopy appears to be greater particularly in the first thirthy years (56.8% of cases), whereas P.O. atopy is more frequent in the second-fourth decades (58.8% of cases). (Figure 1).

Clinical manifestations. In both forms, the symptoms may manifest themselves at any time of the year, but in the case of D.pt.-positives the most intense crises generally occur at the end of the autumn and at the beginning of the summer, whereas those of the P.O.-positives are mostly to be observed in spring and the beginning of autumn.

65.8% of the allergics to mite showed only nasal symptomatology at times with initial asthmatic symptoms. Patients with P.O. atopy, on the contrary, almost all (94.3%) show nasal symptomology.

Involvements of the paranasal sinuses. X-ray studies revealed sinus lesions in 50 out of 63 cases of allergy to mite (79.3% and an analogous frequency was to be observed in cases with associated sensitivizations. On the contrary, out of 35 cases of P.O. allergy, only 9 (25.4%) showed sinusal involvement, which was, besides, more limited and not always characteristic of allergy.

Table 1 gives the results of the analysis of the lesions of the anterior paranasal sinuses in these patients with D.pt. and P.O. sinusopathy. As can be seen, 44 out of 50 persons with D.pt. allergy revealed an involvement of the ethmoido-maxillary complex which was also bilateral. The maxillary lesion appeared either as an opacity (54% of cases), or as a concentric thickening of the mucus membrane (38% of cases), or again as a polyposis (8% of cases). The lesions in cases of P.O. allergy proved mostly bilateral, and in only 5 cases out of 9 we observed an involvement of the ethmoido-maxillary system with opacity of varying degrees or with thickening of the mucous membrane.

Table 1.

Involvement of anterior sinuses in 50 D.pt.-positive and 9 P.O.-positive cases

	Unilateral lesions		Bilateral lesions	
	D.pt.	P.O.	D.pt.	P.O.
Frontal	1	—	—	2
Ethmoidal	2	—	2	2
Ethmoido-maxillary	21	1	23	4
All sinuses	—	—	1	1
total	24	1	26	8

Level of the natural specific blocking antibodies of the serum. The evaluation of the level of the specific blocking antibodies of the serum made with the Maun-

sell test before specific treatment in D.pt.-positive and P.O.-positive cases revealed a fairly even distribution of the end-point in all the different allergenic concentrations experimented. This indicates that in both forms of perennial respiratory allergy there is an analogous exposition to allergens. This fact differentiates greatly these patients from those who suffer from periodical hay-fever who mostly have the lowest end-point even in non-critical periods (Crifò and al., 1973).

Immunological and clinical responces to specific therapy. The behaviour of the serie blocking antibodies after specific therapy expressed by the post-treatment (P) end-point/pre-treatment end point (A) score, was evaluated in the two groups of patients after 12.000 and 40.000 NPU total doses. After 12.000 NPU the D.pt.-positive patients showed, compared to the P.O.-positives a more frequent and more evident increase in antibodies, which, however, was not always in correlation with symptomatological improvement. This did occur, on the contrary, after the ulterior increase in anti-bodies produced by the total dose of 40.000 NPU. The diagram in Figure 3 gives the results observed in 20 cases of mite rhino-sinusitis. After 40.000 NPU also the P.O.-positive patients showed in most cases a considerable increase in blocking anti-bodies, correlated with a fair improvement in the clinical manifestations.

CONCLUSIONS

Our study has shown that D.pt. sensitivity is, in our climate, the most frequent cause or perennial nasal allergy. This form of mite allergy can be observed particularly in children and young people, without distinction of sex. It causes clinical manifestations, which are not always intense mostly in the morning and

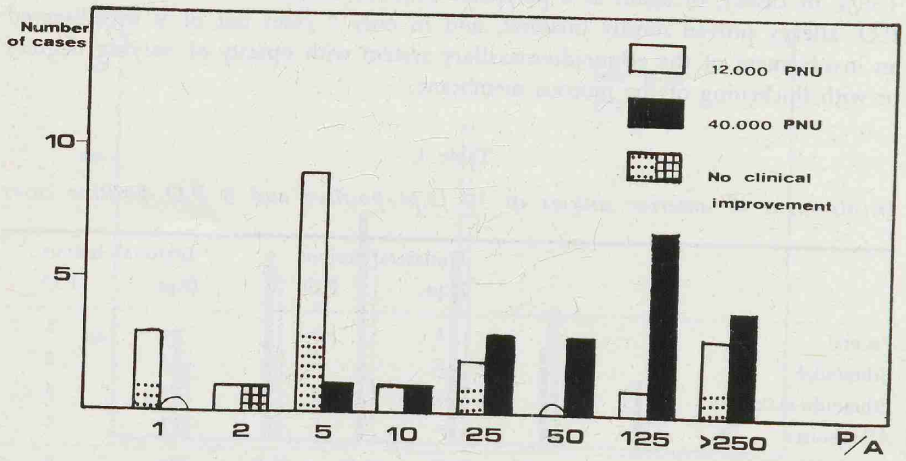

Figure 2. Increase of blocking antibodies (P/A score) and clinical benefits in 20 D.pt.-sensitives after 12.000 and 40.000 PNU total dose of specific treatment. Only after 40.000 PNU we can observe a good correlation between the increase of the P/A score and improvement in the clinical symptomology.

at night, in relation to the closed-in context of the home. In two thirds of the cases the syndrome is only nasal or shows initial symptoms of wheezy-bronchitis; one third of the cases are purely asthmatic. The patients have symptomatological intensification especially in late autumn and/or in early summer, but suffer in lesser degrees all the year round.

The X-ray control of the paranasal sinuses of the patients shows, also in cases which are exclusively bronchial, a frequent multiple and intense sinus lesion, which however is not always related to the duration of the disease before the allergological diagnosis. Moreover this frequent co-involvement of the sinuses does not appear to be caused only by the exposure to mite for the patients with perennial rhynopathy caused by P.O. pollen are certainly equally exposed and do not show such a high percentage of paranasal involvement. Our hypothesis (Crifò and al., 1973 a) is that sinus lesions in people sensitive to D.pt. could be caused mainly by a diffusible allergen of low molecular weight shown in the pattern of the mite (Biliotti and al., 1972).

The frequent coexistence of sinusopathy raises problems of prognosis and therapy in the treatment of mite atopics. As a rule, on the basis of our experience and with the exception of individual cases, before anything else we resort to specific treatment, at first combined with parenteral and local antihistaminic treatment. Only in one case, a polyposis with a strong endonasal component did we restore the patient's nasal permeability through the usual polypectomy. In the other cases we always waited to reach at least 30.000 NPU of specific therapy before considering other therapeutical measures. It is a fact, as we have observed in X ray controls in the forms with concenric thickening of maxillary mucus membrane that non-polypodal sinus lesions appear to respond to specific therapy with a retraction, sometimes very noticeable, of the oedematose mucosa. Since we monitor the specific treatment with an evaluation of the blocking antibodies of the serum, we are able to pass on with the minimum of delay to the continuous therapy, which should be a rule in these perennial forms. This has given us the possibility to establish after six to ten months whether the treatment was effective, or whether it was necessary to couple it with another kind of therapy.

Nasal allergy due to house-dust mite deserves the utmost attention, both because of the existence of disguised or symptomologically modest forms, and of the ease with which it is accompanied by sinus lesions. A precocious diagnosis is therefore desirable. For this reason we are making a screening in pediatric clinics with the purpose of discovering skin-positive cases which the rhynologist could only detect when they reach the sinusitic stage. This research should in any case be made in very case of undefined sinusopathy in children and young people, for it could clarify its causality and indicate the most effective therapy.

RÉSUMÉ

Le dermatophagoides pteronissimus l'acare le plus fréquemment isolable de la poussière domestique, est, dans notre climat, le principal responsable des allergies respiratoires perennes. L'allergie à l'acare peut être observée surtout chez les

enfants et chez les adultes jeunes, et dans les deux tiers des cas provoque des troubles nasals ou naso-bronchiaux, et dans un tiers des cases seulement des troubles asthmatiques. Très fréquemment elle est accompagnée de lésions sinusales, parfois même multiples et intenses. La réaction à la thérapie specifique, lorsqu'on atteint une dose totale d'au moins 40.000 NPU est bonne dans la plupart des cas et comporte une correlation satisfaisante entre l'augmentation des anticorps blocquants du serum et la symptomatologie.

ZUSAMMENFASSUNG

Die Dermatophagoides pteronissimus, die am leichtesten isolierbaren Milbe von dem Hausstaub, ist in unserem Klima der wichtigste Agent der dauerenden Atmungsallergien. Die Milbeallergie findet sich meistens in Kinder und in junge Erwachsenen. In zwei drittel der Fälle provoziert sie Nasen bronchiale Störungen und in einem drittel der Fälle asthmatische Störungen. Ofters wird sie von Sinuslesionen, manchmal ausgedehnte, begleitet. Die Reaction auf die spezifische Therapie, wenn die totale Dosis von wenigstens 40.000 NPU erreicht wird, ist im grösstem Teil der Fälle gut, mit einem guten Verhältnis zwischen Vermehrung der Antikörper des Serums und die Symptomatologie.

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