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Incidence of allergic rhinitis in children

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SUMMARY

The authors give an account of the outcome of research done in the Allergo-Immunological Centre of the IInd ENT Division of Rome University, carried out among 210 children who were affected by nasal atopy. Particular stress was placed on the involvement of the nasopharyngo-tubal system.

The age of the children ranged from 2–12 years and they underwent: 1) ENT visit; 2) allergy tests; 3) anterior rhinorheomanometry; 4) tubal function tests; 5) mucociliary clearance time; 6) X-ray examination of paranasal sinuses.

The results revealed that the most frequent symptom in these children is rhinitis, whatever the allergic sensitization was.

The forms of atopy which manifested themselves by chronical allergic patients (D.Pt. and P.O.) were the cause of: 1. asthmatic-type syndromes; 2. early onset of atopic symptoms around 4–7 years of age (9–10 years in the seasonal forms); 3. greater degree of extrinsical rhinitis with edema of the turbinates – the first step towards a polypoid degeneration of such subjects; 4. tubal functional deficit (60% of subjects allergic to P.O. and 50% allergic to D.Pt whereas only 27% are found in the seasonal forms); 5. mucociliary clearance linked directly with the length of disease; involvement of the paranasal sinuses (53/61 patients allergic to D.Pt., 9/28 allergic to P.O., 9/56 allergic to Graminacee).

Furthermore the nasal patency was more insufficient in patients affected by the chronical forms of the atopy.

In the light of these results the authors advocate focus attention on the significance of an early diagnosis of nasal atopy in children and the need for interdisciplinary collaboration among specialists.

The increase in the past ten years of the incidence of pathology of the upper respiratory tract linked up with a sensitivity towards inhalant allergens (pollens, animal and vegetable dust), has made it necessary to diagnose precisely some diseases of otological nature: rhino-sinusal and rhino-bronchial inflammations and hearing loss linked to reduced tubal function (Crifó, 1977).

It is evident that in such cases an adequate specific therapy is the only way to

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block the progression of a disease often destined to create severe complications, such as, for exemple, in the case of nasal and paranasal allergy; clinical problems that can only be solved by means of surgical methods.
The prevention of such complications involves, besides a correct therapy, above all an early diagnosis, because it is also true that a great deal of these complications result from the fact that the disease was diagnosed many years after its onset and inevitably has been treated aspecifically or insufficiently.
The purpose of our study is to observe the incidence of an allergenic pathogenesis in the inflammations of otological nature involving the upper respiratory tract during the 1st and 2nd stages of childhood.

MATERIALS AND METHODS

The Allergo-Immunological Centre of the IInd ENT Division of Rome University examined 375 children of both sexes, ranging from 2–12 years of age, who presented a rhinitic, rhinoasthmatic rhinosinusitic or otitic pathology.
The patients underwent the following examinations:

1. Anamnesis and objective examinations;
2. Allergy tests: prick tests for pollens, animal and vegetable dust, whereas we preferred intradermoreaction for Dermatophagoides Pteronissimus (D.Pt.);
3. Examination of nasopharyngotubal function:
   - nasal patency was studied by means of anterior rhinorheomanometry, a simple, practical and economical method which allows us to evaluate the degree of patency of the nasal fossa through the value of conductivity (flux/pressure) (Crifò et al., 1975).
   - tubal permeability was studied by means of a method devised by Crifó et al., and allows us to evaluate the degree of tubal patency through the variation of pressure from positive to negative values in the external auditory canal provoked by the manoeuvres of Toynbee and/or Valsalva (Crifò and Cittadini, 1975);
   - mucociliary clearance was studied according to the method of Tremble, estimating, in minutes, the time taken by a coloured substance (Edicol Orange) placed in the anterior portion of the nasal fossa, to reach the lateral wall of the pharynx (Filiaci et al., 1981);
4. X-ray examination of paranasal sinuses in four standard projections.

RESULTS

In Figure 1 we have reported respectively the incidence of positive and negative response to skin tests in the children examined and precise gradation of the sensitivity to the single allergens taken into consideration. As can be noticed, two third of the patients had positive skin reactions as a result of the allergy tests and more specifically 56% responded to a single allergen (D.Pt. 25.33%; Gram. 18.13%;

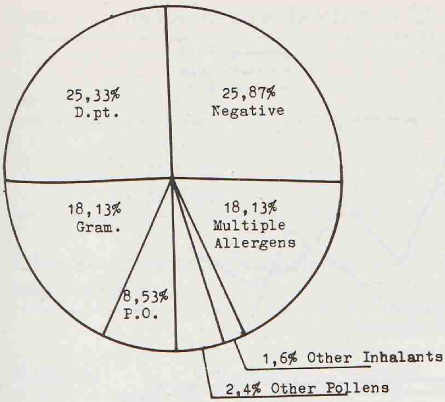

Figure 1. Results of allergy tests in 375 patients affected by pathology of upper respiratory tract.

Parietaria Officinalis 8.53%; other pollens 2.4%; other inhalants 1.6%), whereas 18.13% were allergic to more than one allergen.

Clinically speaking (Figure 2) we found that of the symptoms which manifested themselves among these patients (rhinitis, asthma, rhino-asthma), rhinitis was the most recurrent symptom whatever the allergenic sensitization was; asthma and the combined forms of rhino-asthma recurred more frequently in sensitivity to D.Pt.

Analyzing the age at which the allergic symptoms manifested themselves in these children (Figure 3) its was evident that the onset of the symptoms in the forms due to D.Pt. was much earlier, showing a greater incidence between 4–7 years of age, whereas as far as the pollinosis was concerned the age was much later, i.e. round about 9–10 years.

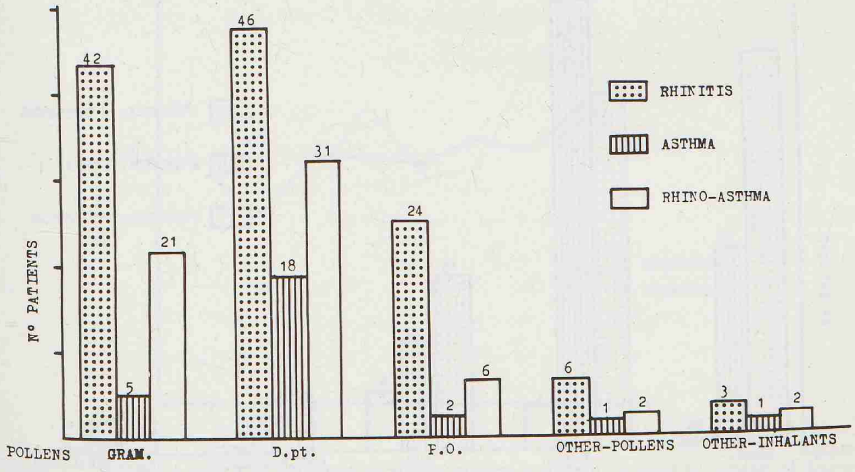

Figure 2. Incidence of clinical signs of diseases in 210 atopic children.

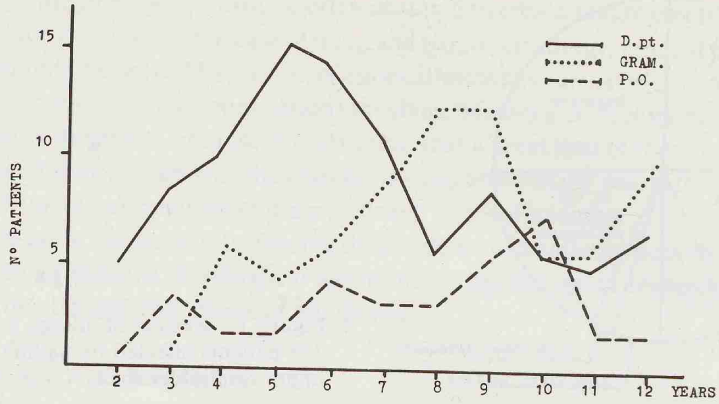

Figure 3. Incidence of allergic symptoms linked to age in 210 atopic children.

The objective examination of the degree of lesion of the nasal mucosa (Figure 4) (1st grade - confestion, 2nd grade - edema, 3rd grade polyposis) revealed how the sensitivity towards D.Pt. involved a greater occurrence of mucous edema whilst that towards P.O., Gram and other pollens and inhalants involved the slightest form of lesion, i.e. hyperemia.

The study of tubal permeability (Table 1) brought to light how those patients who manifested a dysfunction of the tubal function were mainly perennial atopics (in particular 60% of the subjects allergic to P.O. and 50% to D.Pt), whereas this percentage was lower (27%) in seasonal atopics.

Mucociliary clearance was studied bearing in mind the years during which the disease has existed. A deficiency of the mucociliary clearance was noticeable

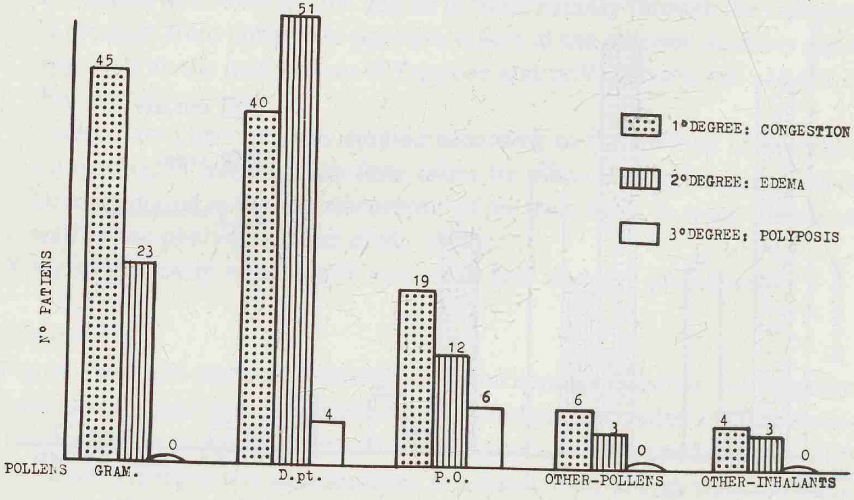

Figure 4. Degree of lesion to the nasal mucosa in 210 children affected by nasal atopy.

Table 1. Progress of tubal function in 72 children affected by nasal atopy.

tubal function test		allergens gram		P.O.		D.pt.	
++/+	no. patients	16		8		14	
+/−	no. patients	7		10		10	
−	no. patients	2	27%	2	60%	4	50%

Table 2. Incidence of radiological involvement of the anterior paranasal sinuses in 192 atopic children.

allergens	no. patients	damage Rx opacity	thickness	polyopsis	positives
gram.	56	7	1	1	8
P.O.	28	8	1	0	9
D.Pt.	61	8	21	3	53
other pollens	8	0	0	0	0
other inhalants	6	0	1	0	1

among the perennial atopic children (Figure 5) (D.Pt. and P.O. positives) in particular after a year in which the disease had not been treated, whereas the radiological study of the paranasal cavity (Table II) proved that these anatomical structures mainly occurred among perennial atopics (53 patients out of 61 subjects allergic to D.Pt., 9/28 allergic to P.O.).

Furthermore, even though no results were referred, the nasal fossa patency was deficient mainly in perennial atopics.

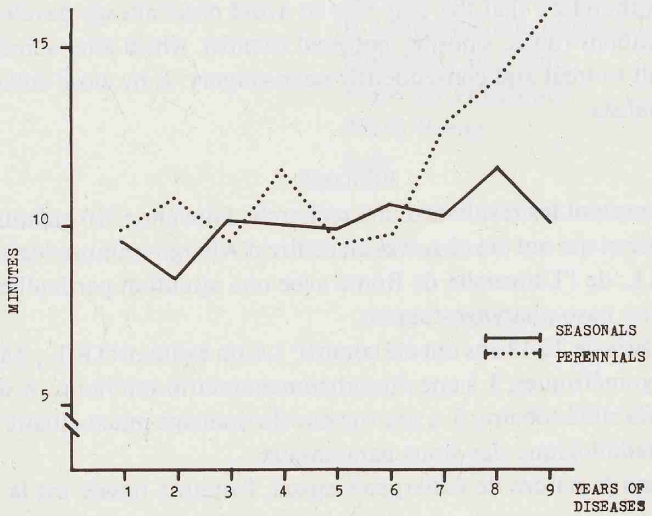

Figure 5. Average time (in minutes) of muco-ciliary transport linked to length of disease in 72 seasonal and perennial atopic children.

CONCLUSIONS

The diagnosis of nasal allergy among children is often made in a late stadium, especially where the chronical forms are concerned. This is brought about by various factors:

1. The presence of anomalous symptoms occasionally represented only by nasal stenosis or hydrorrhea;
2. Attributing the symptoms to a recurrent inflammation or more frequently to adenoidal hypertrophy;
3. Insufficient knowledge regarding allergy on the part of the specialist.

The study brought to light that most of the children with oto-rhino-sinusal and/or asthmatic pathology were affected by atopy showing a greater incidence in the perennial forms as opposed to the seasonal ones. The most frequent involved organ was the nose, whereas the rhino-asthmatic forms occurred mainly among perennial atopic children. However, in this last mentioned group diagnosis was carried out earlier.

The early stage of onset and the chronic nature of the disease explains why in perennial atopic children the nasopharyngotubal system is more frequently affected; this is manifested by a tubal insufficiency and a slow mucociliary clearance. Furthermore the fact, that in the allergenic complex of house-dust acarus a dialysable component was discovered that was able to penetrate into the paranasal sinuses and provoke an endosinusal allergic crisis, can explain why in perennial atopic subjects we frequently find a Rx-positive rhinosinusal pathology (Biliotti et al., 1972).

It is obvious therefore that the only way to avoid nasal allergy developing into local complications (otitis, sinusitis, polypoid rhinitis), which after some time become difficult to treat and consequently need surgery, is by close collaboration among specialists.

RÉSUMÉ

Les A.A. rapportent les résultats d'une recherche faite chez 210 enfants atteints d'atopie nasale et qui ont été observés au centre d'Allergo-immunologie de la IIè clinique O.R.L. de l'Université de Rome avec une attention particulière portée sur le domaine naso-pharyngo-tubaire.

Les patients âgés de 2 à 12 ans ont été soumis: 1. à un examen O.R.L.; 2 à des tests cutanés allergométriques; 3. à une rhinorhéomanométrie antérieure; 4. à une mesure de perméabilité tubaire; 5. à une mesure du drainage muco-ciliaire; 6. à une exploration radiologique des sinus para-nasaux.

Quelle que soit la nature de l'allergène causal, l'atteinte nasale est la plus fréquente.

Comparées aux atopies périodiques, les atopies pérénnes sont plus fréquemment

responsables: 1. d'un syndrome asthmatique, 2. d'un début précoce aux environs de 4-7 ans (9-10 ans pour les atopies périodiques); 3. de manifestations oedémateuses de la muqueuse turbinale; 4. d'une dysperméabilité tubaire (60% des allergies à P.O., 50% des allergies à D.Pt. et seulement 27% des atopies périodiques); 5. d'un déficit du drainage muco-ciliaire; 6. d'une atteinte de la muqueuse sinusale (53 sur 61 atopiques à D.Pt., 9 sur 28 atopiques à P.O., 9 sur 56 atopiques aux pollens de graminées); il existe également une diminution de la perméabilité nasale.

A la lumière de ces résultats, les A.A. relèvent l'importance d'un diagnostic précoce de l'atopie nasale chez l'enfant et la nécessité d'une collaboration interdisciplinaire entre spécialistes.

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