

PERSPECTIVE RESEARCH ABOUT THE DEVELOPMENT OF THE ALLERGIC RHINITIS

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[Studio prospettico sull'evoluzione della rinite allergica]

SUMMARY

The aim of our research is based on the study of the clinical and immunological evolution of the allergic rhinitis in 180 patients through the comparison between the results obtained during the first observation in paediatric age and during the second one conducted after 15 years.

Our research has been conducted through the evaluation of the clinical files of 180 patients affected by rhinitis as a main pathology and paying attention especially on the immunitary aspect.

At the first observation among them 140 patients resulted cutipositive, mostly for mites of dust, less for pollens (graminaceous, parietaria).

The results obtained after 15 years through the second observation have showed a remarkable increase of the percentage of patients positive to the prick test: from 140 cutipositive out of 180 examined patients, 158 of them were positive with an increase of the allergic answer to the pollen component instead of the component of mites of dust.

These files demonstrate as the discovering of cutipositive increase together with the age of the patients and with the maturation of the immunitary system and as the clinical process of the allergic rhinitis are in continuous development and they can change in a biologic relatively limited period. Our results and the clinical experience show that allergic children contract a greater number of respiratory infections which tend to persist longer than the pathologies of the not allergic children and that the continuous stimulation of the immunitary system often causes an hypertrophy of adenoids slowly progressive in most cases if the allergic aetiology is not recognized or underestimated. On the basis of our demonstration we believe that allergic rhinitis cannot and must not be undervalued so a precocious diagnosis and consequently an adequate pharmacological therapy is basic.

Key words: Rhinitis, allergy, sinusitis

RIASSUNTO

Scopo del lavoro è stato quello di studiare l'evoluzione della rinite allergica sul piano clinico ed immunologico attraverso il confronto tra i risultati ottenuti alla prima osservazione, in età pediatrica, ed alla seconda osservazione, a distanza di 15 anni.

Lo studio è stato condotto mediante valutazione delle schede cliniche di 180 pazienti affetti da rinite, ponendo a confronto l'obiettività clinica con l'assetto bio-immunitario. Alla prima osservazione 140 pazienti sono risultati cutipositivi, in maggior numero per acari della polvere ed in minor percentuale per parietaria e graminacee.

I risultati ottenuti a distanza di 15 anni dalla prima osservazione hanno evidenziato un aumento della percentuale di pazienti positivi al prick test. Il numero di soggetti cutipositivi, 140 alla prima osservazione, si è incrementato alla seconda osservazione, raggiungendo la quota di 158. Si è riscontrato, inoltre, aumento della responsabilità allergenica della componente pollinica rispetto a quella per gli acari della polvere.

Questi dati testimoniano come le cutipositività aumentino parallelamente con l'età e con la maturazione del sistema immunocompetente e come la storia naturale della rinite allergica sia evolutiva ed entro tempi biologici relativamente ristretti. I risultati ottenuti e l'esperienza clinica ci hanno permesso di evidenziare come i bambini allergici contraggono un numero maggiore di infezioni respiratorie che durano più a lungo nel tempo rispetto ai bambini non allergici e come la continua stimolazione del sistema immunitario favorisca spesso un quadro di ipertrofia adenotonsillare che può assumere andamento progressivo se non viene riconosciuta o viene sottostimata l'eziologia allergica. Alla luce di quanto dimostrato riteniamo che la rinite allergica non può e non deve essere sottovalutata pertanto risulta fondamentale effettuare una diagnosi precoce e di conseguenza iniziare un trattamento farmacologico adeguato.

Parole chiave: Rinite, allergia, sinusite

Introduction

Allergic disease are in constant epidemiologic increase, so that in certain areas of the planet these diseases involve about 50% of the population⁽¹⁾.

Since the beginning of the industrial age the incidence of allergic rhinitis has been progressively increasing, in fact during the last decades statistic researches have underlined a considerable increase

of this disease⁽¹³⁾, as well as a remarkable change of the clinical picture and this is demonstrated from the evidence that the clinical manifestations of the allergic rhinitis seem more aggressive and so able to cause severe obstacles to a satisfying quality of life.

The problem gets more serious if you consider that the ages most affected are in childhood and adolescence, not only because the immunitary turnover is quicker, but also due to the "new" more

numerous environmental stimuli (bacteria, viruses, toxic, allergic and pollution antigens) “presented” first to rhinosinusal apparatus and then to lower respiratory tract and digestive one. In fact the interface man/environment is constituted of air and food since the very first moments of life; among the foods first of all there is milk.

Air, as it is well known, has always been carrier of viruses and bacteria which coming into contact with our organism facilitates the mucosal and systemic sensitization, so they often put a strain on the cognitive immunitary system and then the ability to distinguish between self and non self.

So during the second childhood it often happens that infectious phenomena overlap and interlace with the allergic ones, so that from the ensuing immunoflogistic picture a wrong etiopathogenetic interpretation could shift and focus the interest on the flogistic manifestations, giving then an improper priority to bacterium and viral phenomena, but underestimating the allergic ones. In many cases the rhinosinusal interest can be present and not manifest any district symptomatology⁽¹⁵⁾, while in some patients with an atopic symptomatology the allergenic cause could be not proved through vivo and vitro tests.

Therefore the evolutive complexity of the problem presses its close examination regarding the chronological aspect.

Materials and methods

Our research has been conducted through the evaluation of the clinical files of 180 patients affected by rhinitis as a main pathology and paying attention especially on the immunitary aspect.

All the patients, who reported as prevalent symptoms: nasal obstruction, nasal itch, sneezing, serous rhinorrhea, had been examined for the first time during their childhood (<14 years old) and they were exposed to prick test for pollen (graminaceous, urticaceae, composite, oleaceae, cupressaceae), mites (dermatophagoides pteronyssinus, dermatophagoides farinae) and mycoflora (alternaria, aspergillus); among them 140 patients resulted cutipositive, mostly for mites of dust, less for pollens.

Among the 40 patients resulted cutinegative 30 of them lamented a rhinitic symptomatology classified as vasomotor rhinitis. The patients of our research were valued between 1993 and 2008 and the cutipositive patients were treated with oral antihistaminic therapy and topical corticosteroids,

nobody was exposed to a specific hyposensitizing immunotherapy.

Results

Our patients were valued after 15 years from their first observation; after a careful anamnesis directed to focus the rhinitic pathology, everybody was exposed to another prick test and, where necessary, to a taking of a blood sample to dose the specific IgE (RAST test).

Compared to the first observation the new test has showed a remarkable increase of the percentage of patients positive to the prick test: from 140 cutipositive out of 180 examined patients, 158 of them were positive with an increase of the allergic answer to the pollen component instead of the component of mites of dust.

Moreover it has been underlined that 12 out of 30 patients resulted cutinegative during the first examination and classified as affected by vasomotor rhinitis, at the second examination they resulted cutipositive and responsive mostly to pollens.

Discussion

The allergic rhinitis is the most common IgE-mediated disease and it is characterized by an inflammatory reaction involving the nasal mucosa.

The persistent synthesis of allergen-specific IgE represents the biologic basis typical of the allergic individual; in fact the difference between an allergic patient and a “normal” one is represented by the antiserum classes produced: IgA and IgG in the normal subject and mostly IgE in the allergic subject⁽²¹⁾. This difference in the immunological arrangement occurs because the production of IgA and IgE is under the control of two cytokines, respectively TGF- β and IL10 which are produced by a particular lymphocyte subpopulation: the regulator cells or Treg⁽²²⁾. In the allergic subject has been found due to these regulator cells, whose deficiency favours the so-called Th2 polarization.

In fact in the allergic subject the T-helper cells of the second type are prevalent. These cells produce cytokines as IL4 and IL13, able to favour and support the production of IgE and moreover to maintain and to amplify the allergic inflammatory phenomena.

The allergic rhinitis is determined by an inflammatory reaction that involves several inflammatory cells, among which the more representative cell is the eosinophil that controls the immunitary reaction

mediate by IgE (as allergies and helminth infections) whose presence can be correlated to many clinical, immunopathologic and functional parameters⁽²⁾, connected to the number of eosinophils penetrating the nasal mucosa.

The immunopathologic picture is always constituted by a Th2 polarization and by an eosinophil infiltrate⁽⁸⁾. In fact it is shown that through the use of steroidal molecules it is possible to reconvert the Th2 polarization towards a physiological Th1 polarization and to reduce the eosinophil infiltrate causing a reduction of the respiratory symptoms⁽⁹⁾.

The allergic inflammation causes a mucosal oedema and nasal obstruction which favours the rise of physiopathologic manifestations able to permit the development of an inflammation-infective process involving nasal fossa and sometimes paranasal sinuses⁽⁴⁾. So the nasal obstruction and inflammation represent the physiopathologic elements that permit us to understand the link between allergic rhinitis and rhinosinusitis⁽⁵⁾. The hypertrophy of the turbinates and the nasal secretion are two of the almost constant manifestations of the rhinitis either of allergic origin or not; both symptoms favour the genesis of the sinus disease through first the congestion and the following stagnation of the secretion in the paranasal cavities.

By now this pathogenetic mechanism is accepted also during paediatric age where the term "rhinosinusitis" is always more often associated to chronic pathologic arrangements of the superior respiratory tract. These arrangements condition other typical pathologies of this age (asthma and adenoids hypertrophy).

Many researches show that in the allergic individual the accidental exposition of the allergen almost always causes the rise of a flogistic arrangement which can not necessarily be accompanied by a symptomatology, in this case we can talk about minimum persistent inflammation⁽³⁾. In fact a remarkable percentage of allergic cutipositive individuals continue to be almost asymptomatic, with slight and however well supported disorders that don't invalidate the quality of life and don't drive to a medical specialist consultation. Practically is established a balancement between external environment and immunitary reactivity which prevents a diagnosis of the allergic disease in many patients, so the clinical incidence of the allergic rhinitis is underestimated.

Some researches have demonstrated that in paediatric age the rhinitis is a disease often associated with allergic and essential asthma^(6,7).

In fact a comorbidity between asthma and allergic rhinitis is frequent; actually it was demonstrated that 20-40 % of patients with allergic rhinitis are also afflicted by asthma, while 30-90 % of asthmatic patients are afflicted by concomitant allergic rhinitis⁽¹⁹⁾.

These two pathologies are characterized by inflammation of the respiratory mucosa and they are associated to the same allergic mediators like histamine, leukotrienes and cytokines released from mast cells activated by allergens, eosinophils, Th2 lymphocytes.

Almost always the respiratory apparatus is interested, so the asthmatic manifestations could gain an advantage over the rhinosinusal ones and when the child is about 3 years old asthma could seem more frequent than allergic rhinitis but only because the latter disease is less evident than the asthma.

During adolescence the bronchospasm could occur in about 20 % of allergic individuals, while the rhinosinusitis concerns 70-80 % of allergic individuals to testify the constant involvement of superior respiratory tract.

Moreover it has been shown that paradoxically an increase of the clinical severity of the persistent arrangements correspond to the decrease of the cases of bronchospasm during the second childhood and adolescence⁽¹⁷⁾.

Conclusions

Our studies and our results have shown the significative change in the answer and so in the immunological structure of the patients, between the first and the second observation; this fact becomes more important if related to the specific period during which it happened (after 15 years).

These files demonstrate as the discovering of cutipositive increase together with the age of the patients and with the maturation of the immunitary system. An other important change shown is the one related to the allergenic responsibility, underlined by the passage of predominance of responsivity from mites to pollens; this prevalence will remain constant in time as it has been shown by the epidemiologic allergic studies conducted in South Europe⁽¹⁸⁾.

So the clinical process of the allergic rhinosinusitis is in continuous development and it can change in a biologic relatively limited period; this shows the always increasing difficulties of adaptation of the superior respiratory tract in the present external environment.

Many studies and the clinical experience show that allergic children contract a greater number of respiratory infections which tend to persist longer than the pathologies of the not allergic children; especially it has been noted that if the superior respiratory tract is involved, the symptoms last twice as long in the allergic individuals⁽¹⁰⁾. These files were demonstrated in the allergic population adult too⁽¹¹⁾.

Thanks to these studies we are able to understand as the allergic rhinitis could constituted a risk factor for the development of a rhinosinusitis and a cause of aggravation of the same pathology. On the basis of our demonstration and of our clinical experience we can believe that the only antibiotic therapy in the children with rhinitis or acute bacterial rhinosinusitis is not enough to assure the recovery in the allergic individuals, contrary to what happens in normal children⁽¹²⁾. So it is clear that in the allergic patient with rhinosinusitis the antibiotic therapy must always be associated to an adequate antiallergic therapy.

Moreover in the children, the almost continuous stimulation of the immunitary system both viral and allergic causes an hypertrophy of adenoids slowly progressive in most cases: it could be the cause of the decision to solve surgically the problem if the allergic aetiology is not recognized through a simple Prick test and if the disease is improperly treated with antibiotics and FANS⁽¹⁶⁾.

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