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Clinical findings in patients with allergic rhinitis

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SUMMARY

Clinical observations, X-ray findings and results of laboratory tests were evaluated in 770 patients with allergic rhinitis. Anamnestic data and results of the allergological examination of these patients have been presented elsewhere (Holopainen et al., 1979b; Binder et al., 1982).

Allergic symptoms were seasonal in 54.5% and perennial in 45.5% of the patients. Mucosal changes as seen on rhinoscopy were significantly more common among patients with perennial than among patients with seasonal rhinitis. Watery discharge was the most common nasal finding, observed in 90% of all patients. Nasal smears showed increased numbers of eosinophilic leucocytes in 70% of the cases. Relationships between the cellular population of the nasal secretion, other laboratory test results and clinical findings are described.

X-ray examination revealed pathological changes in the paranasal sinuses in 53.4% of the patients.

INTRODUCTION

In order to analyse clinical and diagnostic findings in allergic rhinitis we have examined nearly 800 patients with allergic rhinitis by using a set of common diagnostic procedures. Information gathered by taking a detailed history and the most important allergens causing nasal symptoms have been discussed in two previous papers (Holopainen et al., 1979b; Binder et al., 1982), while the present report is focused on the results of the clinical examination, some laboratory tests, and sinus radiography in these patients.

PATIENTS

Of the patients attending the outpatient clinic at the Otolaryngological Department of the University Central Hospital of Helsinki, 770 patients with allergic rhinitis were included in this study. The patients were examined in 1970–76. Sixty-three percent or 484 of the patients were females and 37% or 286 patients were males. Their ages ranged from < 10 to > 60 years.

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According to the case histories (Binder et al., 1982), 54.5% had seasonal and 45.5% perennial rhinitis. The largest age group in the whole series and also in the perennial group was the age range 31–40 years. There were significantly more patients under 20 years in the seasonal than in the perennial group. Not many patients were over 60 years of age: 1.5% in the seasonal and 4.5% in the perennial group. On the basis of the allergological examination (skin testing, nasal challenge, RAST, RIST) extrinsic allergic rhinitis was diagnosed in 683 patients. Causative allergens could not be verified in 87 patients, who were therefore classified as having intrinsic disease (Binder et al., 1982).

The average duration of rhinitis at the time of the present examinations was 4.7 years. There was no significant difference between the seasonal and the perennial groups in regard to mean duration of rhinitis.

METHODS

The diagnostic procedures relevant to this report were as follows:

1. Clinical examination of the nose by anterior and posterior rhinoscopy. The rhinologists performing the examination used uniform criteria to determine nasal status.
2. Exfoliative nasal cytology (nasal smear). The smears were stained and evaluated in the rhinological laboratory of the Otolaryngological Department according to the methods and criteria described by Bryan and Bryan (1959a) and Holopainen (1967).
3. Bacteriological culture of the nasal secretion.
4. X-ray examination of sinuses and teeth.
5. Blood tests for haemoglobin, eosinophil count, antistaphylolysin and antistreptolysin titres.

STATISTICAL METHODS

For analysis of correlations, the Chi-square test and Mann-Whitney U-test were used.

RESULTS

The rhinoscopic findings are given in Table 1. Mucosal hypertrophy and polyps were significantly more frequent in perennial than seasonal rhinitis ($p < 0.001$). Nasal discharge was a common finding both in seasonal and in perennial cases, only 2% of all patients being symptomfree in this respect. The secretion was watery in more than 90% of the patients and purulent in about 7%. Strong deviation of the septum was observed in 9.3% and large adenoids in 2.5%.

Nasal smears showed increased numbers of eosinophilic leucocytes in 70.7% of the patients. Secretion eosinophilia was more frequent among patients with perennial than among those with seasonal rhinitis ($p < 0.05$). Pure secretion eosi-

Table 1. Rhinoscopic findings in 770 patients with allergic rhinitis.

	nasal appearance					
	close to normal		mocosal hypertrophy		polyps	
	seas. %	perenn. %	seas. %	perenn. %	seas. %	perenn. %
anterior rhinoscopy	36.1	23.8	60.3	71.1	3.6	5.1
posterior rhinoscopy	59.0	46.3	41.0	53.7		

nophilia and eosinophils alongside abundant neutrophils were equally common. Appearance of the nasal mucosa and occurrence of eosinophils are compared in Table 2.

Increased numbers of basophilic cells were found in 8.8% of patients, seasonal and perennial groups showing similar percentages. Basophils were more often observed in patients who had reported adverse reactions to food than in patients who had not noticed reactions on food consumption ($p < 0.01$; information from 556 patients).

Table 2. Rhinoscopic findings by occurrence of secretion eosinophils in 735 patients with allergic rhinitis.

nasal appearance	eos + %	eos - %
close to normal	46.8	53.2
mucosal hypertrophy	80.0	20.0*
polyps	93.3	6.7

* Statistically significant difference - $p < 0.001$.

Cultures of the nasal secretion showed pathogenic bacteria in 29.3% of patients. Smears with abundant numbers of neutrophils were more frequently positive for pathogenic bacteria than smears with no or few neutrophils ($p < 0.01$).

Increase in the number of goblet cells was recorded for 55.2% of patients (Table 3). The seasonal and perennial groups had similar frequencies of goblet cells, while increase in goblet cells was more frequent in the extrinsic than in the intrinsic group ($p < 0.05$). Both in perennial and in seasonal rhinitis increase in goblet cells was significantly related with secretion eosinophilia ($p < 0.001$).

Table 3. Rhinoscopic findings by occurrence of goblet cells in nasal smears of 708 patients with allergic rhinitis.

nasal appearance	goblet cells + %	goblet cells – %
close to normal	35.9	64.1
mucosal hypertrophy	62.7	37.3
polyps	76.7	23.3

Smears stained for demonstration of epithelial cells showed normal numbers of ciliated columnar cells in 99% of all patients.
Elevated blood eosinophil levels (observed in 20.5% of the patients) were significantly related with increased numbers of secretion eosinophils ($p < 0.001$), but no correlation was found between normal blood eosinophil values and occurrence of eosinophils in the nasal smear (Table 4).

Table 4. Correlation between eosinophils in blood and in nasal secretion in 610 patients with allergic rhinitis.

	blood eosinophil levels	
	no. of patients	
secretion eosinophils	elevated	normal
increased numbers	112	312
few or none	14	172

Significant abnormalities were not observed in haemoglobin, anti-streptolysin or anti-staphylolysin values.
X-ray examination of the paranasal sinuses revealed pathological changes in 53.4% of the patients. Such changes were more common in patients with perennial than in those with seasonal rhinitis ($p < 0.05$). Pathological findings in the sinuses were significantly related with hypertrophy of the nasal mucosa as revealed by rhinoscopy ($p < 0.001$). This correlation was found in the whole series and in the perennial group, but not in the seasonal group. No correlation was noticed between pathological signs in the sinuses and concomitant asthma.
The dental X-ray examination showed periapical changes in 22.7% of patients with seasonal and 23.5% of patients with perennial rhinitis symptoms.

DISCUSSION

This report relates to the character of allergic rhinitis in adults, because only 0.4% of the patients were under 10 years of age. No age limits had been set and the group can be considered representative of the patient population examined for allergic rhinitis at an ENT hospital. Most of the patients were referred for examination during the winter months, and so symptoms and signs caused by pollens were infrequent.
A rhinoscopic examination alone does not reveal whether nasal symptoms are allergic or not. Careful inspection of the nose is obviously of essence to exclude factors which may contribute to the persistence of symptoms, e.g. septal deviation, conchal anomalies, polyps, tumours, foreign bodies etc.
The cytological examination reported was based on the nasal secretion samples taken from every patient at the first visit. Increased numbers of eosinophils were

found in 70% of the patients, and of those who had normal nasal status at the time of the examination 46.8% had secretion eosinophilia. In a recent study, Okuda (1982) reports nasal eosinophilia in 89% of rhinitis patients. In contrast to earlier observations (Bryan and Bryan, 1959a; Mygind, 1978) neutrophils were not found to mask eosinophils in the nasal smears in the present study.

Bryan and Bryan (1959b) and later Shioda et al. (1979) directed attention to cells which stained with basic dyes, so-called mast cells, in the nasal secretion of allergic patients. Mast cells were shown to be particularly frequent in the smears of patients with adverse reactions to foods but their relationship to food allergy is still a controversial question. In the present study a history of adverse reactions to foods was significantly more common among the 9% of patients with mastocytosis than among the rest of the patients. In another study (Kajosaari et al., 1981) correlation between mastocytosis of the nasal secretion and food allergy was observed only in the age group 0–3 years.

Significant metaplastic changes were not observed, although 1/3 of the patients had had nasal symptoms for over 10 years. In this respect allergic rhinitis seems to differ from atrophic rhinitis, where a disease process of similar duration causes a distinct decrease in ciliated epithelial cells and goblet cells (Holopainen, 1967).

Comparison of blood eosinophil counts and smears did not reveal clear-cut correlations. It seems probable that it is only reactions in larger shock organs such as lungs and skin that are associated with blood eosinophilia (Palva and Palva, 1962; Mygind et al., 1978; Holopainen et al., 1979a). Of the present patients 20% had a concomitant atopic disorder (Binder et al., 1982).

Thickening of the nasal mucosa was the most common pathological X-ray finding. Fluid retention was rarely seen. Sinus pathology was significantly more frequent when symptoms were perennial or intrinsic than when they were seasonal. Radiographic examination of the sinuses is indicated in patients with perennial or intrinsic type of rhinitis but is of little or no value in patients with purely seasonal symptoms.

ZUSAMMENFASSUNG

Von 770 Patienten mit allergischer Rhinitis wurden klinische Beobachtungen, Röntgenbefunde und Ergebnisse von Laboratorientests ausgewertet.

Die anamnestische Daten und Ergebnisse der allergologischen Untersuchung dieser Patienten wurden in früheren Publikationen vorgelegt (Holopainen et al., 1979b; Binder el al., 1982).

Die allergischen Symptome waren bei 54,5% der Patienten saisonaler und bei 45,5% perennialer Natur.

Mittels Rhinoskopie waren bei Patienten mit perennialer Rhinitis Schleimhautveränderungen bedeutend häufiger als bei Patienten mit saisonaler Rhinitis festzustellen. Eine wässerige Absonderung der Nase war der häufigste Befund und

wurde bei 90% der Patienten beobachtet.
Bei 70% der Patienten zeigte die exfoliative zytologische Untersuchung eine erhöhte Zahl von eosinophilen Leukozyten. Es wird das Verhältnis zwischen den Zellelementen im Nasensekret, den Ergebnissen anderer Laboratorientests und den klinischen Befunden dargestellt.
Röntgenuntersuchungen zeigten pathologische Veränderungen bei 53,4% der Patienten.

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