The Eosinophilic Changes in Rhinorrhea due to Nasal Allergy

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Since the early part of the twentieth century, many authors have claimed that eosinophilia is found in the nasal secretions and blood of patients with allergic diseases. This observation has now become an established fact, and recent evidence based on extensive investigation, suggests that the eosinophil may play an active role in allergic disease.

Thus, we report changes in nasal eosinophils in a group of nasal allergy patients treated by specific hyposensitization. The following results were obtained;

1. Eosinophilia was noted in 52.8 percent of untreated nasal allergy patients.
2. The eosinophilic count was gradually decreased with increasing S.D.V. (specific desensitizing vaccine) hyposensitization.

Even in ancient Greece the ill effects of eating blood more than once a day were recorded by Hypocrates in 450 B.C., and in the twentieth century many studies of allergic diseases have been reported.

A scientific basis for tissue immunity began to emerge toward the end of the last century and at the beginning of this century, as a result of animal experiments by Sewall (1887). The first otolaryngologist to incorporate allergy research into his practice was Hansel (1930) of St. Louis. In 1930 he called attention to the allergic factor in many cases of chronic sinusitis and in 1934 emphasized the significance of eosinophilia in the tissues and nasal secretions as an indication of allergy.

Thus the significance of eosinophilia in the tissues and nasal secretions was reported by Hansel (1933) and later reiterated by Vanselow (1967) and Sherman (1968).

The cytotoxic food test of Bryan (1960), the skin test of Rinkel (1963) and the specific hyposensitization technique of Rinkel (1963) and Lee et al. (1969) were reported, but the eosinophilic changes in rhinorrhea due to nasal allergy following hyposensitization therapy have not, to our knowledge, been studied. Consequently we studied the changes in nasal eosinophilia in nasal allergy during treatment by specific hyposensitization.

MATERIALS AND METHODS

The 72 nasal allergy patients who were the subject of this research were diagnosed by the skin prick test in the E.N.T. Allergy Clinic of Severance Hospital during the period from January 1, 1974 to December 31, 1976. The

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prick tests were performed with extracts of allergens manufactured by the Bencard company of London in 1973. The allergen set included 39 inhalant allergens, 34 food allergens and 14 miscellaneous allergens.

The eosinophils of nasal secretions were counted before hyposensitization and subsequently the eosinophils were recounted at the 6th, 18th and 36th week of hyposensitization therapy.

Nasal secretions were obtained by introducing a cotton applicator into the nasal cavity and soaking up secretions from the middle and inferior meatus. The secretions were directly smeared on microscope slides and were examined after staining with Wright stain. Following the Chitesina of Murray at al., (1969) Patients were considered 'positive' if at least two high power fields with 10 or more eosinophils were found.

### RESULTS

Among the 72 allergic cases examined eosinophilia was observed (52.8%) and marked eosinophilia present in 9 case (23.7%). Among 34 cases which were considered "negative" 23 cases (67.6%) showed no eosinophils on the slide.

The number of cases which showed "positive" eosinophilia decreased during the course of specific hyposensitization therapy from the pretherapy level of 52.8% to 40.3% at 6 weeks of therapy, 27.8% at 18 weeks and 20.8% at 36 weeks.

### DISCUSSION

Nasal allergy, which is characterized by symptoms of watery nasal discharge, sneezing and nasal obstruction, is usually classified according to allergen as food allergy or inhalation allergy and by duration as either seasonal allergy or perineal allergy.

Diagnosis of nasal allergy was confirmed by history taking, physical examination, cytology of nasal secretions, skin tests and provocative tests.

In this present study the cytological study of nasal secretions showed eosinophils, goblet cells, mast cells and cells from the nasal mucosa. Other studies also have indicated a relationship between eosinophilia and allergic reactions. Eyermann (1927) reported eosinophilia of nasal secretions, in 72% of 92 nasal allergy cases and Bryan, et al. (1959) claimed that eosinophilia is closely related to inhalation allergy and that eosinophilia was observed not only in allergic diseases but also in 8.7% of bronchial asthma cases. In 1968, Connell observed eosinophilia in the peripheral blood of patients with parasitic infestations and myocardial infarction, but nasal secretions were not investigated.

Varying percentages of eosinophilia in nasal

### Table 1. Eosinophilia in nasal secretion before hyposensitization

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<tr>
<th>Eosinophilia</th>
<th>Present</th>
<th>Absent</th>
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<tbody>
<tr>
<td>* 10-19</td>
<td>28</td>
<td>22</td>
</tr>
<tr>
<td>20-29</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>** Total</td>
<td>38(52.8%)</td>
<td>34(47.2%)</td>
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*10 eosinophils per high power field in any 2 high power field
**Number of eosinophils

### Table 2. Eosinophilia in nasal secretion during hyposensitization

<table>
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<tr>
<th>Hyposensitization</th>
<th>Present</th>
<th>Absent</th>
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<tbody>
<tr>
<td>6 weeks</td>
<td>29(40.3%)</td>
<td>43(59.7%)</td>
</tr>
<tr>
<td>18 weeks</td>
<td>20(27.8%)</td>
<td>52(72.2%)</td>
</tr>
<tr>
<td>36 weeks</td>
<td>15(20.8%)</td>
<td>57(79.2%)</td>
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secrections have been reported by various authors. In 1971, Foxen reported 20% and 30% was reported by Murray (1969). Brown reported a rate ranging from 20~50% in 1936 and Kim, et al. (1975) reported a Korean study with 56.4% positive for eosinophilia. Our results of 52.8% match those of Kim, et al. (1975) and are not far removed from the results of Brown.

Murray (1969) claimed that these differences were due to the characteristics of the allergens and that eosinophilia was observed in 90.0% of patients with pollen allergy but in less than 5.0% of food allergy patients.

Treatment of nasal allergy consists of symptomatic treatment and medical treatment, hyposensitization and surgical treatment. Among these treatments, we used S.D.V. for treatment of nasal allergy.

We suggest that the decrease in the eosinophil count observed after hyposensitization may be due to decreased eosinophilic chemotactic action following the formation of increased blocking antibody.

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