

## Intranasal Injection of Steroid for Nasal Allergy\*

알레르기성 비염에서의 스테로이드 비내주사의 효과에 관한연구

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### INTRODUCTION

The treatment of perennial allergic rhinitis is often unsatisfactory. Of the conventional drugs antihistamines may cause unacceptable somnolence and decongestant nasal drop often produce a rebound exacerbation of allergic symptoms after prolonged use. Intranasal sodium cromoglycate(Cohan et al., 1976), however, is helpful in many patients and systemic steroid therapy is effective but its use for long periods in patients whose symptoms are inconvenient rather than life threatening is rarely justified. Clinical studies have demonstrated the effectiveness of submucosal injection of steroid solution in the treatment of perennial allergic rhinitis due to a variety of offending allergens (Simmons, 1960). Baker & Strauss, 1962; Mowart, 1961; Mabry, 1978; McGrew et al., 1978; Although the effectiveness and safety of submucosal injection of steroid has been tried in the treatment of perennial allergic rhinitis, there is very little literature in the way of double-blind clinical trials.

This double-blind trial was started in February, 1984 and was completed in June, 1984 with 26 cases of perennial allergic rhinitis which were confirmed by history, clinical examinations, laboratory tests and skin test. This study was designed to determine if submucosal injection of

steroid solution would significantly improve the allergic symptoms in a group of patients with perennial allergic rhinitis.

### METHODS AND MATERIALS

Twenty six patients were unselected as to age or sex, who exhibited allergic symptoms such as itchy nose, itchy eye, postnasal drip, runny nose, itchy throat, stuffy nose, mouth breathing, sneezing and/or nose blowing. All had trouble-some throughout the year. On the basis of history, clinical examinations, laboratory tests and immediate skin sensitivity to prick testing with 126 offending allergens (Table 1) the patients were diagnosed as perennial allergic rhinitis. All patients were strongly sensitive to at least one offending allergen. All patients had differential white cell counts, nasal smears, sinus X-rays (Waters' view, Caldwell's view and lateral view). Nasal specimens were smeared on a microscopic slide, stained with Wright's stain. In most instances, 100 cells were counted and the number of eosinophils per 100 expressed as a percentage. Total serum IgE were measured in all patients by phadebas IgE paper disk radio-immunoassay technique (PRIST).

All patients were symptomatic at the time of innitial evaluation and were allocated at random in a double-blind fashion to two groups, one of which initially received placebo(9 patients) and the other steroid-injected (17 patients). Submucosal steroid injection was not difficult. Two

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**Table I.** List of Inhalant Allergens (Bencard)

Allergens	Kinds
Dusts and mites	10
Mold	22
Bacteria	13
Pollens	39
Woods (Waw-dusts)	8
Epithelials	20
Insects, fabrics and others	14
Total	126

**Table II.** Graded Symptom Scores

Scale	Description
0	none
1	mild
2	moderate, not causing much discomfort
3	annoying, causing marked discomfort
4	severe, causing some interference with sleep and/or activities
5	extreme, causing considerable interference with sleep and/or activities

cotton pledgets moistened with 4% cocaine solution were placed along the anterior-medial aspect of each inferior turbinate, and they remained in place for 5 minutes. Using a tuberculin syringe and 25 gauge needle with 0.5ml methylprednisolone 40mg per ml, 0.25ml was injected submucosally in anterior tip of each inferior turbinate. Only the bevel of the needle was inserted to be certain that the injection was given submucosally. The injection was made slowly. As soon as the needle was withdrawn, the cotton pledgets were pushed against the injection site to minimize bleeding. The dose of steroid (Depo-Medrol, methylprednisolone acetate) was 10mg each inferior turbinate. An identical procedure was used with the placebo which contained 0.9 % normal saline solution. Symptom scores, physical examinations, and laboratory tests were

done before and 4 weeks after injection to evaluate long-term therapeutic effect of the submucosal injection of steroid. The seven symptoms were graded according to 0-to-5 scale (Table II). An episode of sneezing or nose blowing was graded according to 0-to-7 scale as follows: 0-5, 0-5 times attack daily, 6, 6~9 times attack daily; 7, more than 10 times attack daily.

## RESULTS

### 1. Patient parameters

A summary of the patient's clinical and laboratory data before placebo or steroid injection was presented in Table III. There was no significant difference between the two groups with respect to age, symptom duration, total IgE levels, total eosinophil count and nasal smears. There was 2 females and 7 males in the placebo group and 6 females and 11 males in the steroid injection group. The duration of disease in the placebo group varied from 1 to 10 years, and that in steroid injection group from 1 to 20 years.

### 2. Clinical examinations

There was no important difference between the physical examination of the two groups before and 4 weeks after placebo or steroid injection.

**Table III.** Comparison Between Study Groups

	Placebo	Steroid	Total
No. of patients	9	17	26
Male/Female	2/7	6/11	8/18
Mean age(yr)	32.7 (16~51)	33.9 (13~54)	33.2 (13~54)
Mean symptom duration(yr)	4.1 (1~10)	4.3 (1~20)	4.23 (1~20)
Mean total IgE ( $\mu$ /ml)	307.6 (28~1135)	179.5 (80~1450)	223.9 (80~1450)
Mean total eosinophil count (eosinophils/mm <sup>3</sup> )	241.9 (77~583)	208.1 (22~330)	218.9 (22~583)

**Table IV.** Differences in Symptom Scores

	Placebo	Steroid	Significance
Itchy nose	-0.250	0.250	NS
Itchy eye	0	0.500	NS
Postnasal drip	0	0.188	NS
Runny nose	-0.250	1.647	P<0.01
Itchy throat	0.250	0.118	NS
Stuffy nose	0.250	0.176	NS
Mouth breathing	0.750	0.118	NS
Sneezing or nose blowing	0.250	0.529	NS

### 3. Laboratory tests

There were no statistically significant differences in eosinophils, serum total IgE level or nasal smears between the two groups before and 4 weeks after placebo or steroid injection. These measurements remained unchanged from the beginning to the end of the study.

### 4. Symptom scores

Table IV listed the symptom score differences for each of 8 symptoms monitored by the two groups between preinjection and 4 weeks after injection. Runny nose was significantly improved ( $p<0.01$ ) but the other symptoms were not.

### 5. Side effects

There was no local or systemic side effect in each group when injecting either placebo or steroid solution.

## DISCUSSION

Many adrenocortical steroids have been tried in the treatment of allergic rhinitis. Intermediate-acting steroids such as prednisone, prednisolone, methyl-prednisolone or triamcinolone (Gilman et al., 1980) have been gratifying in allergic rhinitis, vasomotor rhinitis, rhinitis medicamentosa or nasal polyp. Simmons(1960) reported 78% improvement in 419 patients, with seasonal allergic rhinitis, vasomotor rhinitis and secondary edema from sinusitis, Mowart (1961) reported overall 65% improvem-

ent in 35 patients with allergic rhinitis and rhinitis medicamentosa: sneezing, 65% improvement; nasal obstruction, 68% improvement; nasal discharge, 62% improvement. Baker and Strauss (1962) reported 75% benefit in 487 patients with vasomotor rhinitis and allergic rhinitis, and Mabry (1978) reported 83% effectiveness in 276 patients with severe allergic or vasomotor rhinitis or acutely enlarged nasal polyp. Though runny nose was significantly relieved, this study provided no evidence that treatment with submucosal injection of methylprednisolone was better than placebo in overall symptomatic improvement for the patients with perennial allergic rhinitis. The results contrasts with other reports. The significant decrease in the symptom score of runny nose in the steroid injection group is difficult to explain. Allergic reaction may well be due to inability of the shock organ to utilize sufficient, effective cortical hormones.

Many systemic or local effects of submucosal injection of steroid were reported. Side reactions listed by Mabry(1978) included bleeding (20%) facial flushing (17%), weakness (13%), myalgia (10%), headache(10%), nervousness (3%), nausea (3%), indigestion (3%), postmenopausal bleeding (3%) and temporary diabetic imbalance (3%). The visual loss associated with steroid injection was reported by Rowe (1967), Selmanowitz and Orentreich (1974) and McGrew (1978). No local or systemic reaction has been experienced in our study.

We conclude that submucosal injection of methylprednisolone is of little long-term benefit in the treatment of patients with perennial allergic rhinitis.

## SUMMARY

A double-blind study was performed on 26 adult patients with perennial allergic rhinitis. All patients were characterized clinically as

having perennial nasal symptoms of sneezing paroxysms, profuse runny nose and itchy nose. All patients had markedly positive skin test reactions to at least one antigen. Nasal eosinophilia, CBC and total IgE serum levels were determined before and 4 weeks after submucosal injection of steroid (methylprednisolone acetate 20mg in both sides of the nose). Symptom scores were also documented before and 4 weeks after injection to evaluate long-term therapeutic effect of the steroid injection.

No important differences between the steroid and placebo groups were noted in either anterior rhinoscopic findings, laboratory tests or symptom scores except for runny nose ( $p < 0.01$ ). We conclude that intranasal steroid injection is of little long-term benefit in the treatment of patients with perennial allergic rhinitis.

==국문초록==

### 알레르기성 비염에서의 스테로이드 비내주사의 효과에 관한 연구\*

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통년성 알레르기성 비염을 가진 26명의 환자에서 스테로이드 비내주사의 효과를 규명하기 위하여 이중맹검법을 시행하였다. 모든 예에서 임상적으로 발작성 재채기, 수양성 비루, 비소양감 등의 증상을 호소하였으며, 적어도 1개 이상의 항원에 대하여 현저한 양성피부반응을 나타내었다. 스테로이드 주사액 methylprednisolone acetate를 10mg씩 각 하비갑개에 주사한 후 주사전과 주사후 제 4주에 비루내 호산구수, 백혈구검사, 혈청내 총 IgE값을 측정하였다. 또한, 스테로이드 주사의 장기적인 치료효과를 규명하기 위하여 주사전과 주사후 제 4주에 그 증상을 점수로 기록하였다.

전비경검사, 임상검사 및 증상점수에서 스테로이드군과 대조군 사이에, 비루 이외에는 ( $P < 0.01$ ) 통계학적으로 유의한 차이를 발견할 수 없었다. 저자들은 비강내스테로이드 주사는 통년성 알레르기성 비염환자의 치료에 있어서 장기적인 효과는 없다고 결론지었다.

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