

Intranasal steroid aerosol in perennial rhinitis: comparison with an antihistamine compound

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Summary

Intranasal betamethasone valerate aerosol, given for 28 days, was compared with an oral antihistamine compound in a double-blind, double-dummy, cross-over trial involving thirty patients with perennial rhinitis. The steroid aerosol was more effective in reducing symptoms and was preferred by the patients ($P < 0.01$). Nasal blockage index, calculated from oral and nasal peak expiratory flow measurements, did not provide useful or additional information. There were no side effects from the steroid and *Candida albicans* was not cultured from nasal swabs. It is concluded that betamethasone valerate aerosol is a suitable short-term alternative for patients whose perennial rhinitis fails to respond to conventional therapy.

Introduction

It has been shown that intranasal betamethasone valerate and beclomethasone dipropionate are more effective than placebo in the treatment of both seasonal and perennial rhinitis (Mygind, 1973; Gibson *et al.*, 1974; Archer, Thomas & Harding, 1975) but no comparison has been made between these steroids and conventional therapy in perennial rhinitis. In this study, betamethasone valerate aerosol (Bextasol), fitted with a nasal adaptor, is compared with the antihistamine and sympathomimetic combination—triprolidine 2.5 mg and pseudoephedrine 60 mg (Actifed).

Patients and methods

Thirty patients with perennial rhinitis were investigated (age range: 9–58 years). All had daily symptoms of sneezing, rhinorrhoea and/or nasal obstruction of at least 1 year's duration. Twenty were atopic (prick test positive to one or more of eighteen allergens). The patients had received a variety of drug treatments before entry to the study: twenty-seven had used antihistamines, twenty-two sodium cromoglycate, twenty-one decongestant drops and twelve intranasal steroids (nine, dexamethasone snuff). No treatment had provided complete control of symptoms, although

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some improvement had usually been achieved with either antihistamines or intranasal steroids.

The trial was of the 'double-dummy' type using either active aerosol together with placebo tablets, or active tablets with placebo aerosol. The order of treatments was randomized and each was taken for 28 days after which there was an immediate cross-over to the other treatment. The dosage of Bextasol was one puff of 100 µg in each nostril morning and evening, and that of Actifed was one tablet three times a day. Patients were seen initially, at the cross-over, and at the end of the study.

Assessment was by daily symptom scores, and by twice daily nasal ($PEFR_n$) and oral ($PEFR_o$) peak expiratory flow measurements using a peak flow gauge (Taylor, Macneil & Freed, 1973), which enabled a calculation of nasal blockage index† to be made. In order to minimize any carry-over effects the last 3 weeks of each treatment period were analysed for symptoms; the peak flow rates were measured during the last 2 weeks of each period. The patient's preference for treatment period was also recorded.

Nasal swabs were taken from all patients at each visit for culture of *Candida* species. Mouth rinse specimens, using 2 ml sterile saline, were also taken to establish *Candida* carriers. These were plated onto Sabouraud's dextrose agar and the culture observed after 48 hr at 37°C.

Short tetracosactrin tests for adrenal function, using 0.25 mg 'Synacthen' intramuscularly, were performed on the first fifteen patients. Plasma cortisols were measured using a fluorimetric technique (James, Mattingly & Daly, 1971).

Table 1. Symptom scores (higher scores = more symptoms)

Treatment	Mean symptom scores, 3-week period					
	Eye irritation and watering	Nasal irritation	Sneezing	Rhinorrhoea	Nasal blockage	Total
Bextasol	10.3	10.0	11.7	14.8	20.2	67.0
Actifed	9.2	12.4	12.9	17.1	25.3	76.9
P value*	N.S.	N.S.	N.S.	N.S.	N.S.	< 0.03

* By two-tailed Wilcoxon signed ranks test.

Results

The results are summarized in Tables 1 and 2. The patients' preferences were significantly in favour of the aerosol, twenty-two preferring the steroid and five the anti-histamine ($P < 0.01$, by chi-squared analysis); three patients found no differences between the treatments. There was no difference in the response of atopic compared with non-atopic patients.

The nasal blockage index did not correlate well with symptom scores for nasal obstruction and there was considerable between- and within-patient variation. Morning blockage index was on average lower than evening blockage, whereas the opposite was expected.

$$\dagger \text{ Blockage index} = \frac{PEFR_o - PEFR_n}{PEFR_o}$$

Table 2. Summary of investigations

Investigation	Bextasol		Actifed	
	Morning	Evening	Morning	Evening
Blockage index (mean)	0.51	0.52	0.53	0.55
	Before treatment	After treatment	Before treatment	After treatment
Nasal swab for <i>Candida</i>	All negative	All negative	All negative	All negative
Mouthwash swab for <i>Candida</i>	2 positive	8 positive	1 positive	5 positive
Plasma cortisol, nmol/l (short Synacthen test)	Time 0	309 381	386	279
(all normal)	Time 30 min (min)	822 831	858	842

No side effects from the steroid aerosol were seen but three patients stopped treatment while on the antihistamine compound because of drowsiness, three others complained of nausea and one of palpitations.

Short tetracosactrin tests were completed on nine patients before and after the steroid aerosol and on eight before and after the antihistamine compound; all these tests were normal.

Discussion

The management of our patients presented typical problems. Most had made some improvement on a variety of treatments but still complained of symptoms. Apart from dexamethasone snuff, the most effective therapy had been provided by combination drugs containing an antihistamine together with a sympathomimetic. In this study the betamethasone valerate aerosol proved more effective than such a combination, although the preference for the steroid may in part have been due to the absence of side effects in comparison with the drowsiness or nausea occasionally found with the Actifed.

Infections of the pharynx and larynx with *Candida albicans* may occur with the use of steroid aerosols for asthma. In our study all the nasal swabs for *C. albicans* were negative on culture, but thirteen patients (43%) had positive mouth rinsings at some stage irrespective of treatment; no patient developed oropharyngeal candidiasis.

Objective assessment of the features of rhinitis presents problems which have been discussed previously (Archer *et al.*, 1975). Nasal airways resistance can be measured in the laboratory (Solomon *et al.*, 1965; Jenssen, 1973) but a simpler technique using a peak flow meter as described by Taylor *et al.* (1973) encouraged us to try their method under trial conditions, with the patients taking their own readings at home. However, measurement of nasal blockage index in this way did not prove useful or provide additional information. In some patients poor technique may have played a part although all were seen to use the gauge and mask correctly before taking them home. It seems likely that the method is only suitable for assessing short term changes, such as measuring response to nasal challenge in the laboratory. In addition, to make a comparison between peak expiratory flow rates through the nose

and the lungs may not be valid—bronchial airways collapse during expiration, whereas nasal airways partially collapse during inspiration. Perhaps nasal blockage should also have been assessed by utilizing nasal inspiratory flow rates, obtained by modifying the Wright peak flow meter as described by Nairn & McNeill (1963). Whichever method is used, infrequent assessment of nasal obstruction is bound to present problems because of the marked lability of the mucosal vasculature; some form of symptom scoring still seems to offer the best way of monitoring overall response to trial therapy.

Treatment of perennial asthma with a steroid aerosol frequently produces a favourable response within a week but optimal control may not be reached for several weeks. The same is probably true for perennial rhinitis. Side effects were only monitored over the short period of this trial and, whilst the steroid appeared safe, careful follow-up is necessary to assess any possible effects on the nasal mucosa after prolonged use.

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