

A trial of hyposensitization in 1974/5 in the treatment of hay fever using glutaraldehyde-pollen-tyrosine adsorbate

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Summary

One hundred patients with hay fever were treated in 1974/5 with a glutaraldehyde-pollen-tyrosine adsorbate, the response to treatment being assessed at the end of the hay fever season by direct questioning of the patient and examination of a daily record card. Successful results of treatment were recorded in 73% of all patients, results for both years being similar both for patients who had been previously hyposensitized and for those who had not previously received this form of treatment. Side reactions to treatment were generally infrequent or mild, and in only one patient was it necessary to discontinue treatment due to side reactions.

Introduction

Our previously reported work on hyposensitization of hay fever patients (Johansson *et al.*, 1974) has shown that treatment with glutaraldehyde-pollen-tyrosine gave levels of clinical efficacy comparable to those achieved with alum-precipitated pyridine extract: the incidence of side effects was also similar for the two treatments. Alavac-P was used in these earlier studies because its efficacy had been established by a placebo controlled trial (Kerr & Murchison, 1963). Studies on glutaraldehyde-pollen-tyrosine Pollinex® (Bencard) were continued for a further 2 years during 1974 and 1975 and results are presented in this report.

Materials and methods

Patients

Patients over the age of 9 years were selected on the basis of a history of seasonal hay fever, of duration from 1 to 40 years; some also suffered seasonal asthma. Diagnosis was confirmed by positive prick test to mixed grass pollen extract (Bencard B₂), some patients showing additional sensitivities. Details of patients are shown in Tables 1 and 2, and of previous history in Table 3.

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Treatment

All patients were treated with a standard course of glutaraldehyde modified grass pollen tyrosine adsorbate (Pollinex®) which contains extracts of the twelve most commonly occurring grasses in the British Isles (bent, soft brome, cocksfoot, crested dogstail, false oat, meadow fescue, meadow foxtail, rye grass, meadow grass, Timothy, sweet vernal and Yorkshire fog). The doses in three graded strengths were of 300, 800, and 2000 Noon units (the first injection starting between 9 and 30 April in 1974 and 8 April and 3 May in 1975) and given mainly at intervals of 1–2 weeks but varying between 5 and 21 days. It should be noted that the grass pollen season in Northern Ireland usually starts 2 weeks later than the corresponding season in southern England.

Assessment

Side reactions, both local and general, following treatment were recorded. Patients were asked to complete a daily record card during the pollen season (May–July)

Table 1. Pollinex

		1974	1975	Combined
No. of patients		56	44	100
Sex	M	31	25	56 (56%)
	F	25	19	44 (44%)
Age (years)	Range	10–54	9–53	9–54
	Median	23.5	17	21
Hay fever history (years)	Range	3–33	1–40	1–40
	Median	10.5	5	8

Table 2. Other allergies

	1974	1975	Combined
No other allergies	37	21	58
Pollen asthma	14	12	26
Perennial rhinitis	1	3	4
Pollen asthma	4	7	11
Perennial asthma			
Perennial rhinitis			
Pollen asthma and perennial rhinitis	0	1	1

Table 3.

	1974	1975
Previously hyposensitized	53	5
Not previously hyposensitized	3	39

in which the number of days on which symptoms occurred, the severity of the symptoms graded on a four-point scale, and the number of antihistamine tablets taken were recorded.

Examination of the records at the end of the season was accompanied by careful questioning of the patient. The response to treatment was then assessed on a five-point scale as follows:

VG+, symptom free.

VG, very few symptoms, very much better than seasons without injection treatment.

MI, moderately improved—better than seasons without injection treatment.

SI, slightly improved—a little better than seasons without injection treatment.

NG, the same or worse than seasons without injection treatment.

Results

The incidence of local reactions is shown in Table 4 and it will be seen that they occurred in seven patients (12.5%) in 1974 and in nine patients (20%) in 1975. In both years all local reactions were of a mild or moderate nature and consisted of either swelling or irritation, or both, and the duration of the reaction lasted from 6 hr to 7 days, the majority lasting for about 24 hr.

A summary of the incidence of general reactions is shown in Table 5. In 1974 one general reaction of severe asthma occurred 6 days after the first injection and was precipitated by cutting grass—the two further injections of the course were given without trouble. In 1975 there were three general reactions, one consisting of sneezing following the second injection, and the other of wheezing and tightness 3 days after the second injection. The third patient, a 13-year-old girl being hyposensitized for the first time, had pressure on the chest 48 hr after the first injection, and was treated with tetracycline, antispasmodics and antihistamines; she was the only patient in which

Table 4. Local reactions

	1974	1975
Previously hyposensitized	7/53 (13%)	0/5 (0%)
Not previously hyposensitized	0/3 (0%)	9/39 (23%)
Total	7/56 (13%)	9/44 (20%)

Table 5. General reactions

	1974	1975
Previously hyposensitized	1/53 (2%)	0/5 (0%)
Not previously hyposensitized	0/3 (0%)	3/39 (8%)
Total	1/56 (2%)	3/44 (7%)

Table 6. Results of treatment

	1974	1975	Combined
Previously hyposensitized	VG+ 6 VG 16 MI 19 SI 4 NG 6 } 80% Fifty-one patients	VG+ 0 VG 3 MI 0 SI 0 NG 2 } 60% Five patients	VG+ 6 VG 19 MI 19 SI 4 NG 8 } 79% Fifty-six patients
Not previously hyposensitized	VG+ 0 VG 1 MI 1 SI 0 NG 1 } 67% Three patients	VG+ 1 VG 13 MI 9 SI 5 NG 7 } 66% Thirty-five patients	VG+ 1 VG 14 MI 10 SI 5 NG 8 } 66% Thirty-eight patients

symptoms were considered to be severe enough to warrant discontinuation of the course of treatment.

The response to treatment is shown in Table 6. Six patients were not assessed (two in 1974, four in 1975), one of whom discontinued treatment due to a general reaction. In 1974 all but three patients had previously received hyposensitization treatment, whereas in 1975 only five patients had been previously hyposensitized. This precludes any comparison between the two groups of patients within each year and an overall comparison between years. However, taking the categories VG+, VG and MI together to indicate an overall good response it can be seen that for the previously hyposensitized group in 1974 forty-one of fifty-one (80%) responded well to treatment. For the patients new to hyposensitization therapy in 1975 a response rate of twenty-three of thirty-five (66%) was achieved.

Since assessment was based on symptoms in the current season compared with those in previous years when hyposensitization therapy had not been given, results for 1974 and 1975 may be combined to give a single mean. A mean response rate of forty-four of fifty-six (79%) was obtained for the previously hyposensitized patients, compared with twenty-five of thirty-eight (66%) for those not previously hyposensitized. This difference does not reach statistical significance ($\chi^2 = 1.30$, $P > 0.2$). This overall good response for all patients treated in the 2 years is sixty-nine of ninety-four (73%).

Discussion

The current study is an extension of our earlier work in the treatment of hay fever by hyposensitization. Our first reported study (Miller & Tees, 1974) established the use of tyrosine as an adjuvant which had reduced toxicological hazards. The second study (Johansson *et al.*, 1974) established that modification of the pollen extract with glutaraldehyde reduced its allergenicity without destroying its ability to stimulate antibody production. As a result of this work a glutaraldehyde treatment mixed grass pollen tyrosine adsorbate, Pollinex, was made available in a three-dose form. We used this vaccine in a comparative trial in 1973, comparing it with an established alum-precipitated pyridine extract and found the results of the two forms of treatment very

similar from the point of view both of treatment success and also of freedom from side reactions to treatment. Those sixty-six patients treated in 1973 with Pollinex showed an overall success rate of 77% and those patients treated in 1974 and 1975 have shown similar results with an overall success rate of 73%. The assessments for the three seasons of 1973, 1974 and 1975 were identical and the results from season to season are very consistent. The success of treatment reported here is very similar to that reported by other workers (Girard & Huguenin-Dumittan, 1974; Verstraeten *et al.*, 1975; Purser, 1976).

The incidence of side effects reported here is also consistent with our previous results. Although we have reported general reactions following treatment, some of these have occurred many hours after the injection and it is possible that their association with the administration of the injection may be purely coincidental. The local reactions that have been reported here and previously were generally of a mild nature and none in this study required the patient to discontinue the treatment: the overall incidence of local reactions reported here is 16% and this compared with an incidence of 24% in our 1973 study. These reactions consisted of local redness, swelling or irritation.

In conclusion, this study confirms our earlier studies that Pollinex is a vaccine that has a low incidence of serious side effects and in a course of three injections gives a success rate of about 75% in the treatment of hay fever by hyposensitization.

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