OTHER SUPPORT:

GRAMINEX Flower Pollen Extract

Hay Fever and Pollen Tablets

By Einar Helander

Pollen preparations have been marketed since 1952. Until recently, they have not been used for medical purposes, but have been sold without restrictions as a commercial article. In a paper in this journal, Ask-Upmark (1960) has, however, suggested that pollen tablets should be used in the treatment of patients with prostatitis. It is still too early to state whether such therapy is rational, since a report is given of only a few patients. On the other hand, it can be expected that pollen preparations will be tested in the near future. The object of the present paper is therefore to clarify a problem of importance in this connection—one also raised by Ask-Upmark—i.e., can pollen preparations be administered to patients with pollen allergy without causing side-effects?

This question is important, since pollen allergy—usually in the form of hay fever—has been calculated to occur in 0.5-1% of all persons in Sweden. A number of different pollen types are responsible for these allergies. During a 10-year period (Sept. 1949 to Sept. 1959), 10.509 skin tests were made at the Allergy Department, Gothenburg, on patients who attended for various allergies. Routine tests were made for pollen grains of the following species: timothy, oxeye daisy, mugwort (*Artemisia vulgaris*), birch, alder, hazel and aspen. In a few cases additional tests were, for certain reasons, made with other pollen extracts. On the basis of these skin tests, provocation tests and data given by the patients, 2072 pollen allergies were diagnosed and subsequently treated.

The distribution of these allergies can be inferred from Tab. 1 (cf. Arnoldsson 1955). Since about one-third of the patients tested were allergic to more than one pollen species, the number treated is only just over half the total figure. The figures in this table can be regarded as representative of the Gothenburg region, whereas the distribution differs slightly in other parts of Sweden (Arner 1959).

The pollen preparations on the market (Cernelle, Cernident, Cernitin, Cernitol, Cerniton, Polloton, and Pollisan) contain both pollen husks and pollen extract. The husks are separated mechanically, and then heated with a view to decreasing the risk of allergy. The pollen extracts are obtained with water and organic solvents. In the different extraction procedures, up to 82% of the total nitrogen content of the pollen grains has been recovered. The various fractions are evaporated, and combined into a substance denoted as Cernitin.

According to statements from the manufacturers, the following pollen species are used in the preparation.

1. Timothy 26%
2. Maize 26%
3. Rye 19%
4. Hazel 6%
5. Sallow 6%
6. Aspen 6%
7. Oxeye daisy 6%
8. Pine 5%

It is already mentioned that allergies to timothy, oxeye daisy, hazel and aspen are common in the Gothenburg region. Allergy to sallow is not uncommon in other parts of Sweden in which it grows more

extensively (Arner 1959). Allergy to rye pollen is relatively rare, and that to pine pollen still more rare. Allergy to maize pollen is unknown in Sweden, but occurs in the U.S.A. (Urbach & Gottlieb 1946).

Present Investigation[1]

The composition of the pollen preparations gives good reason to investigate whether they can produce allergic symptoms. Several allergens cause allergic symptoms on oral administration, but the literature contains no data no whether this applies to pollen or preparations of it.

The tests were made on 25 patients who were allergic to pollen, but were healthy in other respects (see Tab. 2). The pollens to which these patients were allergic can be inferred from the table. The results of the tests were graded as follows. Histamine (1:10,000) was used as the positive control and 0.9% NaCl as the negative, the results being given in proportion to the area of the wheal produced by histamine, which is denoted as 3. Thus, 1 = a wheal with an area $^1/_3$ as large, 2 = $^2/_3$ of the area, 6 = twice as large, etc.

[1] The pollen preparations were kindly placed at my disposal by AB Cernelle, Vegeholm.

Tab. 1. Pollen allergies diagnosed at the Allergy Department, Gothenburg, 1949-1959.

Timothy and related grasses	913
Birch	358
Oxeye daisy and related plants	330
Alder	164
Hazel	150
Aspen	143
Rye	11
Fir	2
Reeds	1

1. Skin Tests with Extract of Pollen Tablets and Cernitin

After removing the sugar-coating, the Cernelle tablets were broken up and extracted with 5 parts of 0.9% NaCl, during vigorous shaking, for 2 hours on each of two consecutive days. This solution was sterile-filtered and then used for the tests. So-called cernitin, diluted to 1:10 with 0.9% NaCl, was used in the same way. Here as well, histamine was used as the positive control and 0.9% NaCl as the negative. The results were graded as described above. The extracts were tested on non-allergic subjects with negative results.

2. Demonstration of Antigen According to Praussnitz & Küstner

Venous blood was drawn from the 25 patients in question. After centrifugation, 0.1 ml of serum from each patient was injected intradermally into at least two healthy, non-allergic subjects. The latter had been given 5-25 Cernilton tablets on an empty stomach 60-90 minutes before the experiments. The results were graded as already started (Tab. 2).

3. Direct Administration of Pollen Tablets to Patients with Pollen Allergy

Each of the 25 patients with pollen allergy was given a test dose of one tablet of Cerniton. After one hour, a further four tablets were given, and somewhat later on the same day an additional 20 tablets on an empty stomach.

Tab. 2.

		Age	Skin Test for Pollen								Skin Test		Inverse Prauss.-Küst.			Reaction on oral adminis. No. of Tablets		
No.	Sex	Yrs	Ph	Be	Pr	Al	Co	Po	Ar	Se	Pt	Pe	5	15	25	1	5	25
1	F	19				2	3				2	2			(1)			
2	M	38		7							2	4		(1)	1			
3	M	21	3	6							2	3						
4	F	24		3	5						3	3		(1)	1			a
5	M	15		4	3						2	1			(1)			
6	F	45			4						2	1			(1)			
7	M	34	4		3						3	4						
8	M	53	5		3						1	3						b
9	M	23	4		3					4	5	7						
10	M	25	4								2	4			(1)			
11	M	35	5	5							3	5						
12	M	57	7	4							3	5						
13	F	18	5	5	6	4	3	4			3	4						
14	M	39	5								4	5						
15	F	39			3						1	1			(1)			
16	M	28			6			6			2	3						
17	M	23	5	3							3	5			1			
18	M	17	4	8							3	5			(1)			
19	F	26			4			5			2	3						
20	F	22	6								3	5						
21	M	17	4								2	3						
22	F	52			5				3		2	4						
23	M	14	7								4	5			(1)			
24	M	31	5	5		3	1				2	4			(1)			
25	F	48	6	4							4	5						

Ph = timothy; Be = birch; Pr = oxeye daisy; Al = alder; Co = hazel; Po = aspen; Ar = mugwort (*Artemisia vulgaris*); Se = rye; Pt = extract of pollen tablets; Pe = Cernitin. For grading of cutaneous reactions: see text.

a Inapp. incr. coryza.
b Flatulence.

Results

The results of the experiments are recorded in Tab 2.

The skin tests, both will extract of pollen tablets and cernitin, showed that the preparations contain extremely potent allergens. In most cases, a very large wheal appeared. It can be mentioned that a patient who was allergic to birch only (pollen preparations do not contain birch pollen) also had positive reactions. I have been unable to find any explanation of this cutaneous reaction.

When the pollen preparation was administered orally the so-called inverse Praussnitz-Küstner test showed that a small but sufficiently large quantity of antigen was absorbed in some cases. The reactions were, however, inappreciable in the large majority of cases, and a definite reaction occurred in three patients only. The reactions denoted as (1) may have been unspecific.

In the cases with a definite reaction occurred, the reaction was nevertheless slight. Thus, despite the large quantity of tablets ingested, only small amounts of pollen antigen were absorbed. For this reason, the preparation might possibly be used in attempting oral desensitization in hay fever.

The tests with administration of pollen tablets showed that the incidence of side-effects was low, even with large doses. One patient stated that the large number of tablets produced flatulence, and another that he seemed to feel some increased coryza, persisting for about 12 hours. The patient's complaints were regarded as so negligible that no therapy was indicated.

Unfortunately, the preparation could not be tested in patients with allergy to maize, pine, or sallow pollen. However, in Sweden these allergies play an insignificant or no role. Moreover, there is no reason to believe that they involve any essential differences.

To sum up, it can be stated that the experiments have shown the following:

1. The pollen tablets contain highly concentrated pollen antigens, which are not inactivated by the technical procedure used in their preparation.
2. On oral administration of pollen preparations, the antigen or components of it may be absorbed.
3. Absorption is, however, so slight that no risk of serious complications seems to exist, even if large doses are taken by subjects with pollen allergies. Consequently, hay fever is not a contraindication in those cases in which it is desired to test the effect of pollen preparations in, e.g., prostatitis.

References

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