

MIXED GRASS POLLEN VS. PURE TIMOTHY EXTRACT IN UNCONTROLLED SUMMER HAY FEVER PATIENTS

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SINCE timothy is the most important member of the grass family in eastern United States, most allergists have simplified their diagnostic and therapeutic approach by using its pollen on all grass-sensitive patients. This procedure has been followed for many years, because timothy and all the various other grasses such as June, Bermuda, Orchard, Sweet Vernal, and Red Top react similarly in hay fever patients. Their pollens look alike, and are not distinguishable from one another.

In the New York region and practically all along the eastern seaboard of the United States there are possibly a dozen grasses that are important pollen producers, but the most common are those mentioned above. Timothy is the most extensively cultivated grass, and exceeds all the others combined, hence its common use by most physicians doing allergy. June grass is a very important pasture grass, but Orchard grass now is extensively grown for pasture and hay. Bermuda grass is found practically all over the U.S.A. Red Top also is useful both for hay and pasture, and is widely distributed in this area. Sweet Vernal grass is grown quite profusely east of the Mississippi River, and with Low Spear is the most important of all the lawn grasses. They are also the first of all the common grasses to pollinate, and begin to throw pollen in the air about the third week in May. These individual grasses pollinate for about 6 to 8 weeks, and usually overlap one another. Contrary to the general opinion that the grass season is short, we see patients having hay fever for about two months. Some suffer a good deal in May, others all through the month of June, and still others for the first two weeks in July. On and off one may have symptoms during all of the grass season.

Scheppegregg¹ many years ago observed the similarity of reactions of the various species of grass pollen. VanderVeer found that one could treat a patient with pollen extract of one species of grass, and protect him against all the rest of the grass family. Since there are about a dozen common grasses in this area, this was quite a saving in time and energy for the physician treating summer hay fever or asthma patients. Tuft³ claimed these grasses to possess a common antigenic relationship, and therefore used timothy both for diagnosis and treatment. Urbach⁴ states that the various pollens from all the grasses to be morphologically indistinguishable, differing in size only, and therefore also used timothy extract both for diagnosis and treatment. Chabot⁵ by means of passive transfer tests (Prausnitz and Küstner reaction) with the sera of ten patients apparently proved the identity of antigens in Bermuda grass and timothy. However, Watson, and Kibler⁶ found that hay fever patients in the western states where timothy does not grow, do not give positive skin reactions to timothy pollen. Piness⁷ obtained poor results in fifteen patients treated with timothy extract. These were grass-sensitive patients who gave positive skin reactions to Orchard grass and Red Top, and negative reactions to timothy. Piness and Miller⁸ believe that every member of the grass family possesses a specific antigen, which is, however, related to a certain

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extent to allergens of every other member of the same family. Coca and Grove⁹ were not sure that allergens of one member of the grass family contained the same allergen or antigen as the other members of the same family.

I was in accord with the majority opinion of these men for many years, and have also tested and treated my grass-sensitive patients with a pure timothy extract. Most of them did well on this simple regime. However, about 20 per cent did not do so well during the grass-pollinating season. These cases were problems therefore for many years, especially before the antihistaminic drugs appeared.

About fourteen years ago one of these patients came into my office. He was very miserable, since he was a schoolteacher and his pupils imitated his sneezing and kept the class in a constant uproar. In my quandary to give him some relief, I picked up a vial of a year old mixed grass pollen extract, and gave him 10,000 units instead of the 10,000 timothy that he received two weeks previously. The mixture contained equal parts of the six grasses (Timothy, Orchard, June, Bermuda, Red Top and Sweet Vernal) mentioned above. He never had any constitutional reactions before. This time, however, he developed a most violent attack of sneezing and coughing within ten minutes after the injection. He was relieved with adrenalin, and I began to wonder whether or not I missed something by treating him with pure timothy for a number of years and not the mixed grasses. I treated him therefore the next year with a mixture of the grasses, and he had a very comfortable season. I also began to treat all other grass-sensitive patients who were not doing well under timothy with a mixture of the grasses. Fifty such patients have been slowly collected as they appeared over a period of fourteen years. Many were also sensitive to tree, plantain, sorrel, and ragweed pollen and were treated with the indicated additional pollens. A few gave positive skin reactions to molds; however, treatment with the reacting mold extracts did not give them any added comfort.

Thirty-six patients of the fifty studied had less hay fever when treated with the mixture of grasses than with the pure timothy extract in previous years, and seven claimed no hay fever at all during the grass pollen season. One patient who complained of a troublesome cough in addition to his sneezing felt much better, another with attacks of pollen asthma was completely relieved.

The fifty patients have been skin tested with the individual grass extracts of the same (protein nitrogen) strength, and we found their reactions far from uniform. Many of them reacted more markedly to one or another of the individual grasses than to the timothy extract.

During these years thirty-two patients (including the schoolteacher) have been changed from pure timothy to the grass mixture extract and twelve more had constitutional reactions. These reactions occurred during and after the grass season in patients under perennial or seasonal treatment and the change was always from timothy to the grass mixture using the same protein nitrogen unit strength. These were patients on a maintenance dose, who were not highly sensitive and were taking at least 5,000 p.n. units of extract. In previous years they had not developed any constitutional symptoms following treatment with an extract of timothy alone.

SKIN REACTIONS OF 9 PATIENTS TO THE 6 GRASSES IN 100 P.N. (COOKE) UNIT DILUTION

	ORCHARD GRASS	JUNE GRASS	BERMUDA GRASS	SWEET V.	RED TOP	TIMOTHY
L. B.	Mod.	Mkd.	Mod.	Mod.	Sl.	Mod.
I. G.*	Mod.	Mod.	Mod.	Sl.	Mod.	Sl.
P. K.	Mod.	Mod.	Mkd.	Sl.	Mod.	Mod.
S. G.*	Sl.	Mod.	Mod.	Mkd.	Mkd.	Mod.
M. F.	Mkd.	Sl.	Mod.	Mod.	Mod.	Mod.
H. M.	Mkd.	Sl.	Mod.	Mkd.	Mkd.	Sl.
J. V.	Sl.	Mkd.	Mod.	Mod.	Sl.	Mod.
S. T.*	Mkd.	Mkd.	Mod.	Mkd.	Mkd.	Sl.
J. R.	Mod.	Sl.	Mkd.	Mod.	Mkd.	Sl.

Three of the above cases (*) developed constitutional symptoms when the mixed grass extract was substituted for timothy.

COMMENT

It appears from the above observations that besides a common antigen in all the grasses, there are also other factors in the mixture which are absent from the pure timothy extract. The thirteen constitutional reactions would not have taken place, had the mixture contained the identical antigenic factors that were present in the pure timothy extract.

The variation in skin reactions with the different grass extracts in this group of patients is another point in favor of specific antigens in these grasses, that are apparently absent in the pure timothy extract.

Finally, better clinical results were obtained in 36 cases of the group of 50 when the mixture of grasses was used in their prophylactic treatment instead of the pure timothy extract. It all adds up to the probability of specific factors in the mixture which are absent from timothy pollen extract.

While the number of patients treated in this investigation is not impressive, the results were. Further study is continuing to determine which of these grasses in the mixture has an antigen not possessed by timothy.

SUMMARY

1. Of fifty summer hay fever patients who were doing poorly on pure timothy extract, thirty-six reported better results when treated with a mixture of the grasses.

2. Thirty-two cases of this group who were not highly sensitive and who had reached their maintenance dose were changed from timothy to a mixture of the grasses. Thirteen developed constitutional symptoms when given the same quantity of the mixed grass pollen extract.

3. Nine patients in our series gave more marked skin reactions to some of the individual grasses than to timothy when tested with the same unit strength.

4. There is evidence, therefore, that the grass mixture contains specific antigenic factors which are absent in the pure timothy extract.

5. Patients not doing well on pure timothy pollen extract should, therefore, receive a mixture of the common grasses, or an extract of mixed grasses should be routinely used.

REFERENCES

1. Scheppegegrell, Wm.: Hay Fever and Asthma, Lea & Febiger, 1922, pg. 64.
2. Cooke, R. A.: Allergy in Theory & Practice, W. B. Saunders Co., 1947, pg. 185.
3. Tuft, L.: Clinical Allergy, W. B. Saunders Co., 1937, pg. 383.
4. Urbach, E.: Allergy, Grune & Stratton, 1943, pg. 317.
5. Chabot, R.: Studies in Specific Hypersensitiveness, J. Immunol. 16: 281, 1929.
6. Watson, S. H., and Kibler, C. S.: Etiology of Hay Fever in Arizona and the Southwest, J. A. M. A. 78: 719, 1922.
7. Pinness, G.: Study of Two Hundred and Two Cases of Hay Fever, J. A. M. A. 84: 584, 1925.
8. Pinness, G., and Miller, H.: Specificity of Pollen Allergens, J. ALLERGY 1: 483, 1930.
9. Coca, A. S., and Grove, E. C.: Studies in Hypersensitiveness, J. Immunol. 10: 445, 1925.