THE MANAGEMENT OF GRASS HAY FEVER

C. R. K. JOHNSTON, M. D.

In the greater part of the United States three distinct hay fever seasons are recognized, which correspond to the pollination periods of three plant groups, trees, grasses, and weeds. In the northern states the grass (early summer) hay fever season extends from the last of May until the latter part or the end of July; in the beginning it parallels the late stages of the tree hay fever season.

The grasses are the most widely distributed of the three groups of plants producing hay fever. As a rule they produce a less severe form of hay fever than the weeds, but are decidedly more important than the trees. Unlike the weeds, however, the grasses are important commercially and include the pasture grasses and cereal grains. In the northern states timothy and June grass, two important pasture grasses, are of primary importance in the production of grass hay fever, whereas, in the southern states Bermuda grass is the chief agent. In the northern states the grass hay fever season corresponds to the combined pollination periods of June grass and timothy. Orchard grass and red top are of secondary importance. The cereal grasses are of minor significance except in extensively cultivated areas where rye grass may be of some importance.

Although the term "rose fever" is commonly used by the laity to describe grass hay fever, garden flowers seldom produce symptoms. Flowers are insect pollinated, the pollen is heavy and sticky, and is not sufficiently abundant to be a significant cause of hay fever. Close contact with flowers may produce hay fever symptoms in certain individuals, but even in these cases grass pollen adhering to the rose or other flowers may be the actual cause of the symptoms. However, it is wise to advise hay fever victims to avoid close contact with flowers during the hay fever season.

Although the diagnosis of hay fever is comparatively easy to make, a careful history is advisable and may reveal much significant information. The seasonal recurrence of attacks of sneezing, nasal obstruction, rhinorrhea, and lacrimation are pathognomic. Nasal symptoms usually predominate, but at times the ocular symptoms are very annoying. A dry irritative cough may develop which may indicate incipient asthma. Asthma is the most important complication of hay fever and ultimately develops in about one-third of the untreated cases.

The initial attack of hay fever may be confused with a common cold. After the first day or two of symptoms the thick purulent secretion of the common cold is in marked contrast to the thin watery secretion in the

hay fever patient. The pale edematous turbinates in the allergic individual are also in marked contrast to the reddish, inflamed, mucous membranes in the patient with a cold. A predominance of eosinophiles in the nasal smear also indicates the allergic cases.

Although the great majority of patients consulting us with hay fever are otherwise healthy, a complete physical examination is made in all cases. During the hay fever season while the patient is having symptoms, typical conjunctival injection with lacrimation, rhinorrhea, and pallor and edema of the nasal mucous membrane are noted. A careful chest examination is always made in an effort to detect incipient asthma. Routine laboratory procedures including urinalysis and complete blood counts are also thought to be a worthwhile part of the examination.

A complete allergy investigation should be carried out not only to confirm the diagnosis but also to detect other allergic factors which may be aggravating the patient's symptoms. The date of onset and offset of symptoms should indicate the offending pollen group (grasses or weeds), but the detection of other inhalant or food allergens may result in a much more satisfactory response to treatment. We test routinely for the more common tree, grass, and weed allergens and make about 42 pollen tests in all. These pollen tests are made by the scratch method. Scratch tests are also used for the usual inhalant and food allergens, and all negative scratch tests are rechecked by the endermal method. In the occasional case in which pollen tests are negative or doubtful, and the patient apparently has hay fever, ophthalmic or nasal contact tests are valuable.

Usually patients with grass hay fever react not only to one but to a number of grasses. Fortunately a common antigenic relationship is believed to exist among the various members of the grass family, and for this reason timothy extract is frequently employed as hyposensitization for all the grasses. Better results, however, are obtained by using a mixture of the grasses. Our practice is to use an extract of the four most common grasses in this locality. We have found a mixture of timothy 50 per cent and red top, June grass, and orchard grass 50 per cent to be quite satisfactory. The accepted method for treating hay fever is specific pollen hyposensitization which attempts to increase the patient's tolerance to pollen by injections of gradually increasing amounts of pollen extract. At the Clinic we use all three methods of hyposensitization, preseasonal, coseasonal, and perennial. For the best results in the average case, we prefer the perennial method.

The preseasonal method of hyposensitization was the first to be used and is the one most frequently employed. Ideal treatment is begun about three months prior to the expected onset of symptoms. The first dose is small, the dosage increments are small, and the maximum dose should be reached at the time of onset of pollination. The initial dose is usually

1/10 cc. of a 1:5,000 concentration of the pollen extract. Injections are given twice weekly and are increased by 1/10 cc. provided, of course, that it is well tolerated. After reaching a dosage of 1 cc. of a 1:5,000 concentration, injections are continued with a 1:500 dilution beginning with 1/10 cc. and increasing as before. After the 1 cc. dose of 1:500 dilution is reached, the 1/50 dilution is used similarly.

In the average case we advise about 0.4 cc. of the 1:50 dilution (8000 Noon units) as the maximum dose which should be reached by the last week in May. A maintenance dose of approximately ¼ to ½ the maximum dose (usually 0.1 cc.) is then administered every two weeks until the latter part of July, at which time grass hyposensitization is discontinued. Treatment is resumed on March 1st, the following year.

The dosage schedule may be modified to suit the individual patient's needs. In some instances the maximum dose which the patient will tolerate is 2000 Noon units or less. Very satisfactory relief may be afforded by such a dose. When the time available for treatment is short, the schedule may be speeded up somewhat, omitting some of the doses. When the onset of the hay fever season is less than seven weeks distant, however, it is better to withhold preseasonal treatment.

Coseasonal treatment attempts to relieve symptoms by the administration of small doses of pollen extract as frequently as necessary and should be started as soon as the first definite symptoms are noted. It may be used in patients who have had no therapy prior to the onset of the season or as a supplementary measure whenever preseasonal or perennial treatment has not given satisfactory relief. It is especially helpful when preseasonal treatment has been inadequate either because of a late start or irregular treatment.

Coseasonal treatment is begun as soon as symptoms become troublesome. The first dose given is very small, usually 0.1 cc. of the 1:5,000 pollen extract. If satisfactory relief is obtained, the same dosage is continued upon return of symptoms. If relief is inadequate, the dosage of the second injection is increased. Whereas, if the first injection causes an exacerbation of symptoms, the second dose is reduced. The injections are continued daily or every second or third day depending upon symptoms, and the dosage may be gradually increased consistent with the symptomatic relief obtained. The maximum dose reached during the season seldom exceeds 0.5 cc. of the 1:5,000 pollen extract. It is wise to supplement the pollen treatment with 2/10 cc. of 1:1,000 adrenalin solution or preferably a mixture of adrenalin 1:1,000 and ephedrine 3 per cent in equal parts.

Perennial therapy is looked upon with favor by most allergists and is an attempt to maintain the patient's tolerance to pollen at a high level

throughout the year with hope of producing a permanent remission. A so-called permanent "cure" does occur in a small percentage of cases. It is debatable whether perennial therapy gives more adequate seasonal relief than the preseasonal method, but it has the advantage that the patient is kept under supervision throughout the year which permits the earlier detection of other allergic manifestations such as the development of a perennial rhinitis. Furthermore, it avoids intensive preseasonal treatment, and spring vacation or illness will interfere much less with perennial than with preseasonal treatment.

Perennial therapy may be instituted any time during the year, preferably as soon as the diagnosis is made. If sufficient time is available before the expected onset of the hay fever season, the injections are given only once a week in dosage similar to preseasonal treatment. Upon reaching a dose of 1/10 cc. of the 1:50 grass mixture, injections are maintained at that level and the interval is extended to semi-monthly. About May 1, or approximately four weeks before the expected onset of the grass season, the weekly schedule is resumed, and the dosage is increased 1/10 cc. weekly reaching the maximum dosage of 0.4 cc. of 1:50 dilution by the end of May. Thereupon a maintenance dose of 1/10 cc. is resumed twice monthly and continued throughout the remainder of the year. The hyposensitization injections are similarly built up prior to the onset of the season the following year.

Although the treatment of choice is specific pollen hyposensitization, a few fortunate individuals avoid pollen contact each year by moving to pollen free districts. Air conditioning or a mechanical filtration of the air, either of the whole or part of the home, will provide adequate relief, but this restricts the patient's activities to such an extent that it is applicable to only a few. Such palliative or symptomatic measures are helpful in cases otherwise untreated, or in which inadequate relief has been obtained. Symptoms will be lessened by keeping off of golf courses and avoiding open windows and traveling during the season, especially by automobile. Any form of strenuous exercise such as swimming and tennis is also to be avoided. Dark glasses partially relieve ocular symptoms, and eye washes or preferably cold compresses of boric acid or normal saline are recommended. When ocular distress is marked, a weak solution of adrenalin chloride (1:5,000 or less) in normal saline is of considerable value. Ephedrine in dosages of gr. ⅜ preferably combined with amytal gr. ¾ or phenobarbital gr. ¼ will relieve some of the nasal distress. If rhinorrhea is very marked, atropine sulfate in dosage of 1/300 to 1/500 gr. may be used in addition to the above. Nasal sprays of ephedrine 1 – 3 per cent or neosynephrine ¼ to 1 per cent are also recommended.

CASE REPORTS

The following two case histories illustrate a typical problem of grass hay fever and another type of seasonal rhinitis which may be confused with hay fever.

Case 1. A 15 year old youth had had the typical ocular and nasal symptoms of grass hay fever for two years. His symptoms began approximately May 30 and were worse during June and July. His symptoms did not entirely clear up until frost, although there was no flare-up during August or September to suggest weed hay fever. He had no asthma.

The history further revealed one severe attack of hives and one attack of poison ivy. His father had had both grass and ragweed hay fever and had developed perennial asthma seven years prior to death which had occurred during a severe asthmatic paroxysm. One brother had grass hay fever and urticaria.

The physical examination was normal except for pallor and edema of the nasal mucous membranes with slight conjunctival injection. Routine laboratory examinations were normal except for a 6 per cent blood eosinophilia. Sensitization studies revealed definitely positive reactions to all grasses as well as to the pollen of the grain, rye. There were no weed reactions. Several reactions to inhalants were obtained, the more important of which were to house dust, orris root, and molds. Food reactions included wheat, corn, rice, chicken, peas, beans, and sweet potato.

The patient was first seen in September. Preseasonal grass treatment was started the next spring approximately March 1 according to the plan outlined and reached the maximum dose in the latter part of May. At the same time an inhalant extract of the more important inhalant allergens was given, and he was advised to avoid unnecessary contact with the various inhalant allergens and to follow a restricted diet during the hay fever season. He obtained excellent relief and was almost 100 per cent free of symptoms during the entire hay fever season.

A second case illustrates seasonal rhinitis from mold sensitivity simulating hay fever. This type of problem might be called non-pollen hay fever.

Case 2. A 14 year old girl suffered for five consecutive summers from attacks of sneezing, nasal obstruction, and watery discharge. The symptoms developed in early June and disappeared following the first frost. The year preceding treatment, however, they had started in late May, for the first time. She was free of symptoms during the winter months and had only the usual number of colds. No other allergic manifestations had been noted. Her father had a chronic catarrh, and her mother had migraine.

The physical examination and routine laboratory investigation were essentially normal.

The few pollen reactions obtained were questionable. Ophthalmic tests for both grass and weed pollens revealed only questionable reactions to the dry powder. Endermal tests to inhalants, however, revealed positive reactions to house dust, feathers, orris root, and to several molds, notably a strong reaction to alternaria. Several positive food reactions were obtained, chiefly to the bean group.

An avoidance program for the inhalant and food allergens was outlined, and hyposensitization for the significant inhalants, including molds, was instituted. Treatment was begun on April 15. Mild nasal symptoms developed on May 23. By July 1 these symptoms were much less severe than during the previous year and remained fairly well controlled all summer. When last heard from on June 13 of the following season, she had had several weeks of treatment and was entirely symptom free.

The first of these cases represents a typical case of grass hay fever, and the second, a type of seasonal rhinitis which may be confused with

pollen hay fever. It is worth observing that from the history alone a case of seasonal rhinitis due to molds was not distinguishable from symptoms produced by pollinosis. This emphasizes the value of complete allergy investigation in such cases. Seasonal rhinitis due to factors other than pollens usually is associated with symptoms not sharply limited to any one of the hay fever seasons. Symptoms usually begin late for the grass hay fever season and early for ragweed. Furthermore, exacerbations of symptoms do not correspond to peaks in the pollen count.

In cases of mold allergy symptoms are usually worse following damp periods and improve in dry weather, whereas, in hay fever the opposite holds true. Control of symptoms by hyposensitization with mold extracts confirms the diagnosis.

SUMMARY

No attempt has been made to discuss all aspects of the grass hay fever problem. The emphasis has been upon treatment, and various types of hyposensitization have been discussed. Our method of treatment has been given in some detail, and our reasons for preferring perennial therapy.

Certain general conclusions may be emphasized.

1. Each case of hay fever must be treated as an individual problem and warrants complete investigation.

2. A detailed history is extremely valuable and should include an investigation of other manifestations of allergy, especially as to whether or not asthma exists as a complicating factor.

3. Pollen tests alone are not adequate and should be supplemented by tests with the more common inhalant and food allergens.

4. Allergy management should include not only specific pollen hyposensitization, but also the avoidance of other significant inhalant and food allergens and hyposensitization for other inhalant allergens, especially molds, when indicated.

We believe that the treatment of choice is perennial pollen therapy, supplemented by a well-rounded program of allergy management, which may also include coseasonal pollen treatment if symptoms develop to warrant it.