MANAGEMENT OF THE PATIENT WITH POLLEN ALLERGY

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It is the purpose of this discussion to present briefly the principles of management of the patient with pollen hay fever and asthma. Although pollen allergy may be manifested as a seasonal dermatitis or eczema, the majority of patients exhibit typical ocular and respiratory symptoms of hay fever or asthma or a combination of the two. Our presentation is limited to subjects with hay fever and asthma.

The problem of control of pollen allergy interests not only the allergist but many others engaged in the field of therapeutic medicine. It is at this time of year that patients with pollen allergy begin to contemplate the management of their problems. Fortunately, a small percentage of sufferers have been under the care of physicians and have received the perennial method of pollen hyposensitization which assures them some degree of relief from their symptoms in the future; however, the majority of patients are not under care and many will present themselves to the physician in the next few weeks or months.

It is estimated that between three and four million subjects in this country suffer with hay fever or asthma. Balyeat[1] states that approximately two per cent of the population suffer with this particular condition. Piness and Miller[2], after a survey of 4000 subjects in two communities on the West Coast, found that 4.4 per cent of the first group and 3.0 per cent of the second were hay fever victims. A similar survey in New York and vicinity was carried out by Cooke and Vander Veer[3] and revealed that 3.5 per cent of the total population suffered with hay fever or asthma. Such figures indicate that one out of every thirty subjects suffers with pollen allergy. This therefore makes management of the patient's problem of more than casual interest to the average physician.

Many phases of treatment are undertaken by both patient and physician. Unfortunately, economic circumstances permit only a few sufferers to visit the pollen-free areas. Pollen hyposensitization has been accorded most satisfactory results and promises today the best means of control of this particular problem. When Noon[4], in 1911, treated the first patients suffering from pollen hay fever and asthma by hyposensitization measures, only a small percentage of the patients obtained satisfactory clinical relief. Since that date, advances have been made both in diagnosis and therapy and this has resulted in an increasing high percentage of patients who secure satisfactory clinical relief. It is now conceded that from 90 to 95 per cent of the patients who undertake pollen hyposensitization treatment attain what they consider a satisfactory degree of relief from hay fever symptoms.

This is true of the patient suffering with simple hay fever symptoms. It is acknowledged by most workers that patients with pollen asthma are more easily treated than those suffering with simple hay fever.

The success of treatment of pollen allergy is dependent upon a number of principles. These remarks are based upon the data obtained in a study of 400 patients who came to the Cleveland Clinic in the past three years for diagnostic and therapeutic advice for the control of pollen allergy. Although a number of these patients were under our personal care, the majority were seen by us for diagnostic investigation, and therapy has been carried on by the home physician with suggestions as to management, the pollen antigens being supplied by us.

Patients who suffer with perennial allergic rhinitis, perennial asthma, or perennial bronchitis may be sensitive to pollens to a very mild degree, but other substances, either inhalants, such as house dust, feathers, animal epithelia, orris root, foods or bacterial infection, are the major factors in the production of the symptoms. In patients with pollen allergy, pollen sensitivity is by far the major factor. There is a distinct seasonal variation in the symptoms these patients experience, although many have exhibited mild symptoms throughout the other seasons of the year which were accounted for by various inhalant and food sensitivities. Our efforts, therefore, have been directed toward adequate knowledge of the plants which produce pollens that cause hay fever and the thorough control of these sensitivities.

The first requisite in the adequate control of the subject with pollen allergy is a botanical survey. The investigator must be acquainted with the pollen-producing plants that are indigenous to the section in which the patient lives and also the periods during which the plant blooms and discharges the pollen into the atmosphere. One recognizes that there are a great many plants in every locality. Many of these are capable of producing pollens that are exciting causes of hay fever. However, on close survey, the investigator finds that the majority of these plants are not present in sufficient abundance or do not discharge pollens in sufficient quantities to produce hay fever symptoms. The following requisites are necessary for pollens to produce hay fever and asthma.

1. The pollen must contain an excitant of hay fever.

2. The pollen must be wind-borne as regards its mode of pollination and must be carried a considerable distance.

3. The pollen must be produced in sufficiently large quantities.

4. The plant producing pollen must be widely and abundantly distributed.

After a careful survey of these requisites, one acknowledges that only a few plants fulfill all five requirements. We know that in Cleveland and vicinity a definite number of trees, a few grasses, and two weeds are the principal producers of pollen which cause symptoms of hay fever. In recent years, local botanical surveys have been carried out by men interested in the control of pollen allergy and fairly accurate data have been accumulated regarding the distribution, the abundance and the time of pollination of the plants producing symptoms of hay fever. For those interested in the control of pollen allergy, knowledge of the local situation regarding pollen hay fever producing plants can be obtained through: (1) a careful study of the surveys, (2) through field trips and (3) through daily pollen counts. We found it necessary in our work to make frequent visits into the surrounding country during the hay fever season in order to ascertain just how abundant the plants were, what types were present, and when the plants were pollinating. For three years, we have carried out daily pollen counts according to the method of Mr. O. C. Durham, chief botanist of the Abbott Laboratories, Chicago.

Our pollen counts over a period of three years have included counts in the grass and weed pollen season. The work this year includes a daily count during the tree pollinating season in an effort to secure a most thorough knowledge of the trees which produce pollen hay fever in this vicinity. The greatest value of daily pollen counts is knowledge concerning the plants producing pollen in the surrounding section, as well as the type, abundance and time of appearance and disappearance of pollen in the atmosphere. Likewise, they have been valuable in attempting to interpret hay fever symptoms during the active season. As noted, their greatest value is as a diagnostic aid. However, during the hay fever season the pollen counts are distinctly advantageous to patients undergoing coseasonal treatment because it aids in regulating the correct dosage of pollen antigen for the patient. Therefore, the first requisite in diagnosis of pollen allergy is a careful and thorough botanical survey of the abundance of plants and their type, and a pollen calendar in which daily pollen counts are recorded.

In Ohio and the surrounding section, there are three distinct hay fever seasons; the tree, the grass and the weed. The tree season begins about the last week in April and reaches its height the last two weeks of May, continuing through June. The pollen of the silver maple is usually the first to be detected in the atmosphere. This is closely followed by elm pollen and later the pollens of poplars and willows. The pollen of the oak tree, which is the most abundant and the principal cause of tree pollen hay fever appears during May and is present well into June. This produces a definite overlapping effect with the grass hay fever

season. Trees other than elm, poplar, willow and oak which produce pollen in Ohio and the surrounding sections are ash, black walnut, hickory, sycamore, birch, beech and box elm.

The grass hay fever season begins about the third week in May, reaches its height the third week in June and tapers off gradually to a nonactive stage about the second week in July. The season of 1935 was definitely prolonged due to climatic conditions, the pollen being present in the atmosphere in a sufficient quantity to produce hay fever until the first week in August. A careful review of patients suffering with grass hay fever confirms these findings as suggested by the daily pollen count. The grasses producing hay fever in Ohio and surrounding sections are orchard grass, June grass, Redtop and Timothy, and it is generally acknowledged that the Timothy pollen is most abundant and produces the most trouble. Most workers use a large percentage of Timothy pollen in treatment of patients with grass hay fever. Plantain begins to pollinate in May and continues throughout the greater part of the summer but, in so far as our studies are concerned, the pollen is not present in sufficient quantity to be an actual excitant of hay fever. Other than the grasses mentioned, we do not believe there are any of clinical significance in this section of the country.

The fall hay fever season begins approximately August tenth to fifteenth, according to local weather conditions. Giant and short ragweed pollens produce at least 95 per cent of the pollen appearing in the atmosphere during August, September and October. In Ohio and the surrounding sector, we see pollen-producing weeds which are active excitants of hay fever, but the scarcity of such weeds prevents them from being a factor in the production of clinical hay fever.

In making daily pollen counts over a period of three years we have not been able to recognize or identify any type of weed pollen other than ragweed. Clinical study likewise emphasizs the fact that immunization to ragweed antigen produces excellent clinical relief if other existing allergy is controlled. We routinely include in our studies pollen tests with all weed and grass families. Reactions to these pollen antigens are commonly elicited but no clinical significance can be established in regard to patients' hay fever problems.

One immediately raises the question of the proper approach to the problem of the patients with pollinosis. One dictum deserves emphasis. These patients with allergy must be individualized both as regards to investigation and to treatment. The first and most important step in this plan of individualizing the patient is to elicit a detailed history. The character of the symptoms and the onset must be determined with accuracy because these are to be correlated with our knowledge of the pollen

seasons. The effect of various climatic conditions on the general health is a point of especial value, particularly in this area where the seasonal variations and weather are definitely unfavorable to patients with allergy. Seasonal hay fever during the late winter and early spring is often complicated by acute infection in the nose and, therefore, the differential diagnosis between chronic infection, rhinitis and allergy is not easy. The personal history should always include information regarding the number and frequency of colds, various data relating to other acute upper respiratory infections, and a careful history of nasal surgery. In our investigation of patients with allergy, particularly pollen allergy, approximately 30 per cent of these patients exhibit evidences of hypometabolism or else true hypothyroidism. Certainly, one should not overlook a glandular disorder such as this in attempting to obtain the best clinical results. Chronic focal or systemic infection should never be overlooked. Dietary habits, modes of living and any environmental factors should be investigated. Although only of academic interest, it is of definite advantage to make a careful inquiry regarding any family history of allergy.

In addition, every patient should have a thorough physical examination and a careful examination of the nose and throat. As a rule, only the typical findings of allergy will be revealed on examination of the nasal passages. At times, mechanical barriers, such as a deflected septum, spurs and even occasionally chronic sinus infection and nasal polypi will be found which definitely would prevent a satisfactory recovery unless removed. It is our belief that these mechanical barriers should be corrected before the advent of the pollen hay fever season. Certainly, no work should be instituted during the active hay fever season. From the correlation of the history and the physical findings, special examinations may necessarily be indicated to disclose or exclude pathological conditions which would affect the general health of the patient. Routine blood counts, blood Wassermann test and blood sugar estimation are always carried out. We do not make nasal smears for eosinophilia because it is our impression that blood eosinophilia is fairly constant in a high percentage of these patients. Chronic infectious processes of the upper respiratory tract are present in many instances during the early hay fever season, and the value of the red blood cell sedimentation rate is certainly worth considering in differentiating between infection and simple allergic reaction.

Following the preliminary examination, complete and thorough tests for allergens are made. In patients with seasonal hay fever, the investigation should never be limited to pollens alone. It is the experience of investigators in the field of allergy that one of the greatest causes for

failure to obtain a satisfactory clinical result is inadequate investigation as well as inadequate treatment. Workers in allergy recognize the importance of standardized, reliable potent extracts for skin testing, and they agree that such study is dependent upon minutely detailed searching, and that considerable time and effort are necessary to procure satisfactory results. Failure usually results when the investigation is carried out with a limited number of allergens that were purchased as a special offer from some commercial supply house. Emphasis should be placed upon the necessity of reliable potent extracts for pollen investigations as well as testing for inhalant and food allergens.

Several methods of testing for various allergens are available: these include the scratch, intracutaneous and the passive transfer method. The patch tests with the oil or the whole pollens are of value when pollen allergy is a suspected factor in cutaneous lesions. The choice of the method of testing is made as soon as it is decided that any seasonal variation in symptoms is present. Patients with a definite history of seasonal variation in their symptoms should always be tested with pollens by the scratch method, using the flexor surfaces of the arms. This procedure will prevent systemic reactions, which are discouraging to the patient as well as the physician. For epidermals, inhalants and foods, the back of the patient presents the best site for testing for several reasons: It provides an ample area for a large number of tests, a skin of fine and consistent texture, a blood supply which is constant, and an area that renders interpretation of the skin reactions more uniform and accurate. When tests are made on the arms, from five to six visits are required, whereas the use of the back permits from one hundred and fifty to two hundred tests to be completed in two and not more than three sittings. The number of tests that can safely be made on each visit depends upon the state of hypersensitivity of the patient, the strength and potency of the extracts, and the reaction of each individual to the substances. The tests should include all the possible offending allergens. In our experience one hundred and fifty to two hundred includes every angle in the average case of pollen allergy. Occasionally a repetition of the tests is necessary but, as a general rule, visits on two days will suffice for a complete examination and investigation for allergy.

Ophthalmic and intranasal tests for suspected allergenic substances have their place in the allergic survey. These tests are performed by simply placing in the conjunctiva or blowing against the nasal mucosa small quantities of purified dried powder of the substance that is suspected. If hypersensitivity exists, an immediate reaction is noted, and the substance can readily be washed out with normal saline and weak adrenalin solutions. Often a severe reaction occurs, which may be

discomforting to the patient for a few days. Because of this undesirable reaction, and because testing by scratch, intracutaneous and passive transfer methods are reliable in pollen allergy, we have not employed ophthalmic and intranasal tests. In complete investigations of more than 3000 patients over a three year period, we have noted only three patients with pollen allergy who failed to respond by direct methods of skin testing. It is obvious that refractive skins are practically unknown in pollen allergy.

The fallibility of determining allergens by skin testing has received considerable criticism from time to time. In most instances, criticism has been stimulated by the failure to identify the causative agents and the number of false positive reactions that are occasionally encountered. Undoubtedly, skin tests are not accurate in 100 per cent of the cases, but it is true that skin testing, in the hands of an experienced worker who uses reliable and potent extracts, gives a working knowledge of the patient's problem which cannot be paralleled by any other known diagnostic procedure. In pollen allergy, skin testing gives the highest degree of accuracy. These tests give reliably accurate results in 90 per cents of the patients.

Certain precautions must be taken in testing hay fever patients. A solution of epinephrine (1:1000) should always be available during testing. During the procedure of testing, the patient should be questioned as to any known idiosyncrasy before each test substance is used.

Therapeutic Methods

In pollen allergy, sensitivity to pollen is the largest factor. Only a few patients have the opportunity of visiting pollen-free areas. Hyposensitization to the specific offending pollen therefore is imperative. Is it acknowledged among workers in allergy that pollen hyposensitization by the accepted methods will give 90 per cent of sufferers adequate relief of symptoms? What methods are to be adopted to carry out therapy which results in such excellent clinical relief? It has been noted previously that each patient must be individualized, both as to investigation and to therapy. Complete survey of the patient's problem is necessary; this includes not only tests for pollens of suspected trees, grasses, weeds, but also a careful interpretation of the allergens other than pollen, and strict adherence to the prescribed routine of elimination or hyposensitization. Occasionally, we have seen a patient with seasonal hay fever and asthma who could not be hyposensitized, but who had very little discomfort during the pollen season because he had strictly eliminated all epidermal, inhalant and food substances to which he was found sensitive. This is not the method of therapy to be advised, but it does illustrate that allergens other than pollens play a part in the pro-

duction of patients' symptoms. For this reason, we stress the advisability of a strict allergic regimen, particularly before and during the active hay fever season.

Three methods of therapy may be used in hyposensitization procedures—coseasonal, preseasonal and perennial.

Coseasonal Hyposensitization: The patient who is seen at the onset or in the middle of the hay fever season and who has had no form of therapy presents a difficult problem. For many years, it was considered undesirable to begin treatment during the active hay fever season but, in recent years, many workers have adopted a plan of coseasonal treatment which is devoid of any danger to the patient and results in satisfactory relief of symptoms in from 60 to 70 per cent of the cases. The first procedure with the untreated patient suffering acutely with hay fever and asthma is to completely investigate the allergy, prescribe a strict routine, limit activities, prescribe mild symptomatic measures and institute very small doses of pollen antigen at frequent intervals. The doses of pollen antigen under these circumstances deserve more than a casual note. The initial dosage should be from 5 to 30 pollen units, (0.05—0.3 cc. 1:10,000 solution) with repeated injections at one or two day intervals, gradually increasing the dosage to not more than 80 or 100 pollen units. As the season advances, an optimum dosage of 150 or 200 units may be used, but in our practice, we never use more than this amount. Such minute doses of antigen given two or three times a week will result in excellent relief of symptoms. More care should be exerted and smaller dosage should be administered if one is dealing with hay fever and bronchial asthma. The asthmatic tends to get an overdosage very easily, with consequent intensification of symptoms.

Preseasonal Hyposensitization: Most physicians use the preseasonal method of hyposensitization. The patient reports to the physician two, three, four or five months before the expected hay fever season begins. Allergy tests are made and treatment is carried out with pollen extract based upon the patient's history, results of skin tests and knowledge of the patient's environment. Treatment is instituted with small doses of pollen antigen, 10 to 30 units, and the dosage is increased at each injection unless an undesirable reaction is obtained until an optimum dosage is reached for the individual patient. This is usually between 3000 and 6000 units of pollen antigen. With the onset of the hay fever season, the dosage is decreased to approximately 2000 or 3000 pollen units, and maintained at this level until the active pollen season ends. The inoculations are given at intervals of twice a week until a substantial dosage is obtained and then continued at weekly intervals until the close of the hay fever season.

Perennial Hyposensitization: Today, many workers are advocating the perennial method of hyposensitization in the treatment of pollen allergy. A close analysis of opinion concerning this method discloses no points of disfavor and many advantages. Briefly, the advantages may be stated as follows:

1. Intensive preseasonal or coseasonal treatment is avoided.

2. The tendency toward unfavorable local or systemic reactions is decreased.

3. Contact between patient and physician is established and maintained throughout the year. The value of this feature can hardly be overestimated. Many deviations of a patient's health from normal may be corrected in the early stages if he is under the close observation of a physician. We have also found it opportune in a number of patients taking the perennial method of therapy to institute other measures of hyposensitization, particularly to house dust in the domestic and to bacterial vaccines in the patients who exhibit a definite tendency to upper respiratory tract infections during the fall, winter and spring seasons.

4. Treatment may be instituted at any time of year; this enables the physician to distribute his work more evenly throughout the year and to avoid a preseasonal or coseasonal rush of hay fever sufferers.

5. Perennial hyposensitization permits the patient privileges of vacation and travel. Most patients seek vacation during the summer or early fall months when pollen is heaviest in the atmosphere. The perennial method of therapy presents a convenient aid to the patient in this respect.

6. The final point of advantage and probably the one of greatest significance in control of pollen allergy is that the perennial method of hyposensitization offers some promise of a permanent immunity. One does not work with hay fever and asthma patients for any length of time before he realizes that this is the point of interest to the patient. That permanent immunization can be effected in a large percentage of patients if thorough and consistent therapy is carried out is beyond any pale of doubt. Walker[5] reports cures in 26 per cent of his patients after preseasonal treatment extending over a period of years. If excellent results are obtained with preseasonal hyposensitization over a period of years, perennial treatment should yield equally good or superior results. Observation of a large group of patients receiving the perennial method of therapy over a period of years will answer this question.

A certain percentage of patients with pollen allergy report for investigation during the fall and winter seasons for hay fever, asthma or some other allied allergic state and begin the perennial method of therapy.

However, the majority of patients enter the all year method of treatment after an intensive preseasonal or coseasonal course of therapy has been followed. Instead of discontinuing dosage, the patient continues to take pollen antigen injections at weekly intervals, the dosage being gradually increased to a maximum level which may be any amount between 3000 and 30,000 pollen units, depending upon the individual case. It is agreed that the results in an individual problem do not depend upon giving a large amount of pollen antigen, but rather upon the reaction of the patient to immunization procedures, regardless of the amount of antigen employed. Injections are best continued at weekly intervals through the first year of therapy. Less frequent intervals may be employed in the late years of pollen therapy, but the interval should never be greater than two weeks. In this respect, we differ with the commercial supply houses, who are extensively advertising their pollen extracts for the perennial method of hyposensitization and advising that injections be given once a month. Satisfactory immunity cannot be obtained with such infrequent injections.

Certain points should be emphasized in regard to the technic of pollen therapy. Too severe local reaction or any sign or symptom of systemic reaction should be avoided. Signs and symptoms of constitutional reaction indicate shocking of the tissues and not stimulating immunity. It is far more advantageous to give a subreaction amount of pollen antigen throughout the course of therapy than to encounter one general reaction. If such a reaction occurs, the dosage should be decreased to a safe level, several injections of this amount being given, and then the dosage should gradually be increased again.

The possibility of giving the pollen extract intravenously should be avoided. By careful aspiration of the syringe after the needle is placed in the subcutaneous tissues, this possibility, as a rule, can be eliminated entirely, but occasionally an error in overdosage is made. Immediately, a tourniquet is placed above the site of injection, a 1:1000 solution of adrenalin is injected in and about the site where pollen antigen was given and small amounts of epinephrine are injected into the opposite arm. After a few minutes, the tourniquet is slightly loosened for a few seconds and then reapplied. The tourniquet is alternately tightened and loosened for a period of thirty minutes, permitting small broken doses of antigen to reach the vital tissues. The patient should be kept under observation for a period of two or three hours and, if discharged, very complete instructions should be given to the patient or relative for the use of adrenalin in case a delayed reaction occurs in six, twelve or twenty-four hours. Many serious reactions can be avoided by the use of this simple technic.

Patients who have received injections of pollen antigen should be kept in the office for 20 or 30 minutes in order to observe and control any constitutional reaction. If reactions are to be noted, they will usually occur in this period of time.

The question of securing potent and reliable pollen extracts for testing and treatment purposes arises. Many commercial supply houses offer perfectly satisfactory antigens in standardized dilutions for therapy in the average case. The antigens are usually prepared in groups, such as the "Spring type," the "Fall type" or a mixture of the two. One immediately recognizes the limitations of this type of therapy and the lack of individualization for each allergic patient; furthermore, no complete allergic survey has been made, and no correlation is possible between the clinical history and suspected allergens. It is conceivable that any method of therapy directed along these lines would result in satisfactory relief in the average patient, but would fail in the patients whose conditions deviated from the normal.

Many physicians have availed themselves of diagnostic allergy units whereby complete investigation may be carried out. Treatment sets of pollen antigen may be prepared according to correlation of clinical history, skin reactions to pollens, and a thorough knowledge of the pollen flora in the patient's environs. In this way, not only are more accurate methods used in planning therapy, but the patient is given the opportunity of availing himself of knowledge concerning his own allergic state and regarding allergic factors discovered in testing, and he is also stimulated to study his allergic problem. Practically all workers in allergy prepare their pollen extracts and supply treatment sets to the family physician; these are accompanied by detailed instructions regarding the administration and suggested schedule of dosage. Such a plan of coöperation between the allergist and family physician assures the patient of keener interest in his problem and ultimately of more successful relief of symptoms. In the past three years, we have followed this plan of coöperation with the family physician in more than 300 patients. Results in this group of patients have been very gratifying, and a high percentage have secured satisfactory relief of symptoms. It is needless to state that the average hay fever sufferer is dependent upon his family physician for ultimate control of his problem and we believe the results obtained by the concurrent and coöperative efforts of a central diagnostic allergy unit with the patient's private physician will lead to a better knowledge and control of the pollen allergy problem.

Regardless of every effort, a certain percentage of patients will be found who have discomforting hay fever and asthma symptoms during the most severe days of the pollen season. A discussion is incomplete

without some mention of measures to afford relief of the acute symptoms.

If the patient has rather acute symptoms, the following measures should be considered:

Limit activities.

Avoid undue exercise, heat and fatigue.

Stay out of the country, off golf courses, avoid swimming by all means and do not drive more than necessary.

Eat lightly. Carefully check the diet for known or suspected food allergens. If any uncertainty exists, eliminate common food allergens such as wheat, eggs, milk, potatoes, tomatoes, etc.

Insist on normal gastro-intestinal elimination.

Avoid flowering plants. Check house for any possible flowers and remove these and have the room thoroughly cleaned.

Avoid contact with house dust and smoke-congested rooms.

Remove from environment any known or suspected epidermal or inhalant allergen.

Beware of cosmetics. Use the non-allergic brands of cosmetics that can be obtained at any good pharmacy.

In effect, keep in mind that any substance may be aggravating the patient's symptoms.

Drug therapy is necessarily limited, and when employed should be mild.

Eye drops of the following composition are helpful:

℞ Holocain hydrochloride ..... gr. 2
Zinc sulphate ..... gr. ¼
Adrenalin 1:1000 ..... ℥ 1
Distilled water qs. ad. ..... ℥ 1

Sig. 2 - 3 drops in each eye, 3 - 4 times a day.

Eye washes of boric acid solution or normal saline serve to relieve the average sufferer. If edema of the conjunctiva is marked, ten drops of a 1:1000 solution of adrenalin added to an eye cup of normal saline solution gives good relief. Shaded glasses are quite helpful. Ice water compresses applied to eyes several times daily will allay irritation and give a sense of comfort.

The nasal passages are best untreated unless symptoms are severe. In this case, a nasal spray of 1 per cent aqueous solution of ephedrine sulphate with five grains of metycaine to one ounce is helpful. If the patient is irritated by ephedrine, it is best to resort to a weak solution

of cocaine, such as 2 per cent cocaine hydrochloride which is used as a nasal spray. Under no circumstances is local nasal medication to be used unless the patient's discomfort demands such therapy. Oily solutions such as nose drops are as a rule irritating. It is always advisable to use an atomizer in order to secure a more uniform distribution of the medicament to all surfaces.

For oral administration, preparations of ephedrine, atropine and aspirin are commonly used. Before prescribing drugs, the patient should be questioned carefully as to knowledge of any drug sensitivity. It is easily recognized that oral administration of any drug in doses that will not produce toxic effects can be of only limited value to the patient who has severe hay fever or asthma. In our experience, drug therapy by the oral method is of little value, although one may find the exceptional patient who responds nicely to small amounts of the drugs mentioned above.

When the patient with pollen asthma is acutely ill, bed rest is imperative. All of the preceding precautions should be exerted fully, particularly the necessity for a liquid or light diet, plenty of hot drinks, good gastro-intestinal elimination, care of any possible inhalant or food allergens. Ephedrine or ephedrine and amytal may control the paroxysms. The use of a 1:1000 solution of adrenalin hypodermically, as necessary, or the use of the newly marketed adrenalin 1:100, inhaling the fine mist from the nebulizer, is indicated in the more severely ill patients. There is no advantage in withholding adrenalin, permitting the patient to suffer one paroxysm after another because this tends only to exhaust and weaken him. A small dose given in the early stages of an attack will prevent many severe paroxysms. In our experience, morphia is usually disastrous, atropine is contraindicated in almost 100 per cent of the cases, and iodides are of questionable value in the acute stage. The same is true of preparations of calcium. Mild sedation is indicated in the average patient since it removes some of the restlessness and anxiety. *The best form of therapy is the institution of investigation and control of the patient's allergic problem to prevent such a recurrence in the future.*

Summary

Adequate control of pollen sensitivity is the largest factor in pollen allergy. Hyposensitization measures have resulted in excellent clinical relief in the majority of patients with pollen allergy. Failure to obtain satisfactory relief is due to inadequate investigation and inadequate treatment. We have summarized our methods both from diagnostic and therapeutic angles of caring for pollen allergy sufferers. Our results are based on the studies of 400 hay fever asthma patients seen at the Cleveland Clinic in the past three years. Emphasis is placed on adequate investi-

gation and individualization of treatment in every case. Our results lead us to believe that the problem of pollen allergy can well be cared for if the principles of diagnosis and treatment noted in this presentation are effectively carried out.

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