

HAY FEVER AND ITS SUCCESSFUL TREATMENT.

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The history and symptoms of hay fever are so familiar, that for the sake of brevity, that rare literary jewel, we will omit their consideration. The nature of the disease and its treatment are of all-absorbing interest.

Upon the pathology of hay fever there is pretty general unanimity of opinion among American specialists. In an extensive personal correspondence with a large number of these able gentlemen, I have taken pains to ascertain their views, and with few exceptions they adhere to the theory of its essential neurotic character. This is not antagonistic to the uric acid theory proposed by the writer at the meeting of the American Medical Association in 1893, as follows: An excess of uric acid in the blood causes hay fever, or nervous catarrh. Attacks can be stopped by precipitating the excess of uric acid from the blood by rendering the latter less alkaline with an acid treatment. Attacks can be prevented by reducing the amount of uric acid in the body to the normal, and maintaining it there. Uric acid exists in the blood in the proportion of about one to thirty-three of urea in health. When this proportion is disturbed by a relative increase of the uric acid, certain disturbances of a vascular and neurotic character arise. Among the manifestations of uric acidemia are: headache; pains in the limbs; insomnia; lassitude; depression of spirits; irritability of temper; the pains of neuralgia, rheumatism and gout; intense pruritus; eczematous eruption, the dermal analogue of coryza; numbness of the skin; creeping sensations; hyperesthesia and pain in the skin; asthma; epilepsy; coma; etc. Many of these symptoms of uric acid irritation are closely allied to paroxysms of hay fever, or, more properly, nervous catarrh. Sick headache and asthma sometimes alternate with these attacks, or take the place of them.

While suffering from migraine, Haig found the uric acid increased to the proportion of one in twenty or twenty-five of urea, whereas be-

fore and after attacks he found it as one to forty; and the headache was proportioned to the excess of uric acid over the urea, and not to the amount of alkali used to bring the uric acid out. The mental condition varied directly with the relative amount of uric acid in the urine. The excretion of the acid was greatly diminished before the attacks, *i. e.*, during mental exaltation. He claims that the effect of uric acid is to contract the arterioles and capillaries all over the body, producing the cold surface and extremities, raising tension of pulse, and, according to Marcy's law, that pulse rate varies inversely as the arterial tension, slowing the heart. Headache is attributed to a local vascular effect of the uric acid. During the warm months, or when the hay fever season is the worst, there is an excessive excretion of the acid, while in cold weather there is a minus excretion. During plus excretion there will be high arterial tension with anemia of the brain, bad temper, and other symptoms of irritation. Haig maintains that at this time a dose of acid would free the brain circulation from the power of the uric acid, and produce, as Roy and Sherrington have shown, an increase in its size and a free flow of blood in its vessels. Following these deductions Haig relieved his attacks of migraine, from which he was a great sufferer. He found during an attack of influenza that there was a rise in the acidity of the blood, urine and tissue fluids, thus driving the uric acid out of these fluids, diminishing its excretion and causing its retention in the body. Bertillon says that suicides increased forty per centum in France after the influenza epidemic. This may be accounted for by the accumulation of uric acid in the body during the diminished alkalinity of the blood, and when the blood regained its normal alkalinity the stored acid was taken into the circulation and produced its characteristic irritability and depressing effects.

In health about five to eight grains of uric acid are secreted every twenty-four hours, and it is readily soluble in the blood, which is slightly alkaline. If there is increased formation of this acid no harm results so long as it is promptly eliminated and the ratio between it and the urea is not disturbed. Haig found that by diminishing the alkalinity of the blood he freed it from uric acid, relaxed the arterioles, relieved headache and mental depression. Increasing the alkalinity increased the acid excretion, contracted the arterioles, slowed the circulation of the blood, and caused languor, depression, headache, and in epileptics a fit. Epilepsy, migraine, spasmodic asthma, etc., are like neurotic catarrh—functional nervous diseases. What Haig says about epilepsy and migraine may be affirmed of asthma and hay fever: "They may come on early in life, last for years or

the whole of life, tend to recur at more or less regular intervals; are met with in members of the same family, may afflict one and the same patient—now a fit, now a headache, alternating or together. Epilepsy and headache, gout and rheumatism, are very commonly met with in the same family." Cerebral anemia appears to obtain in hay fever, and the attacks are relieved by such remedies as relieve anemia of the brain: amyl nitrite, coffee, and other cerebral stimulants.

While pursuing the study of gout and allied diseases dependent upon lithemia, I was struck with the close analogy between the conditions present with their local manifestations and the various phenomena of hay fever. The theory that the paroxysms of hay fever are due to a uric acid toxemia is not antagonistic to the present status of medical opinion or surgical treatment, but, on the contrary, explains questions that were inexplicable before. As a tumor or hypertrophied bone may give rise to convulsive seizures in epilepsy, and as its removal may be followed by relief, when no other structural cause exists, so in hay fever where new growths and other lesions of the nasal mucous membrane are present, the attack may be started by the accumulation and the suddenly setting free of uric acid. This precipitates the paroxysm by its irritant action, which finds expression in the group of symptoms characteristic of hay fever or asthma instead of some one of the other allied diseases. The particular form of manifestation may be determined by the growth, or seat of irritation, located in the nasal cavities. Where this is the only determining factor of the nature of the morbid symptoms, no other organic disease having resulted from the long-standing trouble, the removal of such a peripheral source of irritation may give relief from these symptoms, but it may not prevent the uric acidemia from switching off into other kindred lines of disturbances, if it be not corrected.

However, the primary determining cause of the particular manifestations in this disease is an inherent, perhaps hereditary, susceptibility of the nervous system. In this way only can we account for the fact that the same subjective or objective exciting cause (uric acid, pollen) will produce one train of distressing symptoms (nervous coryza) in one individual, and an entirely different one in another (asthma or migraine).

This uric acid hypothesis explains why some persons suffer from attacks under certain conditions in winter as well as during the warm months. It also unifies all the various forms of hay fever. They are all variations of a nervous catarrh. The periodicity of hay fever has a counterpart in migraine, which comes once in every seven, ten, fourteen or thirty days, for years or for life. But enough has been said to lay the base line of a treatment that has proven vastly more successful than any other thus far devised.

The treatment must take into consideration the three-fold nature of the disease: 1st, the abnormally susceptible nerve centers; 2d, the hyperesthesia of the peripheral termini of the sensory nerves; and 3d, the various local irritating agents. Among the third causes I class uric acid. A prominent feature of these seizures is that they often come on suddenly in the morning when first awakening from sleep, although the previous afternoon and evening may have been free from suffering and the night one of restful repose, with no direct access of dust-laden atmosphere from without and no change in the contents of the sleeping apartments.

The following facts appear to explain this: the blood is the most strongly alkaline between the small hours of the morning and 9 A. M., when it reaches its greatest alkalinity. The more alkaline the blood the more freely soluble is the uric acid. Therefore, in the morning hours the blood is the most heavily charged with this irritant, and during these hours patients suffer the most from angina pectoris, migraine, asthma, hay-fever, and other functional nervous disorders.

The blood is the most acid during the hours of bodily activity, and it reaches its maximum of activity about midnight. During this time there is only a small secretion of uric acid, and the amount circulating in the blood is minute. As the blood begins to increase in alkalinity in the morning it dissolves the uric acid out of the more alkaline tissues in which it has been stored—the liver, spleen, cartilages, joints and fibrous tissues—and with the increasing alkalinity and solvent properties of the blood it becomes rich in uric acid, until it produces the drowsiness, heaviness, or other nervous phenomena peculiar to any given case.

The palliative treatment for the uric acidemia consists in promptly freeing the blood of it by the use of an acid. I have used dilute sulphuric acid in doses of twenty or thirty drops in an abundance of water, but on account of the griping pains and its relaxing effect on the bowels it was necessary to abandon its use. I found the Horsford acid phosphate an excellent substitute. I used teaspoonful doses of this without any ill effects, and with the result of giving complete immunity from suffering. One or two teaspoonfuls in a glass of water at bedtime and on first awakening in the morning were sufficient to break up the habit entirely. Bence Jones claims that citric acid clears blood of uric acid. I have made it a point to have the morning dose well diluted with water, for the purpose of starting the perspiration; for I have observed that as soon as a patient has sneezed violently enough to induce free sweating, the symptoms decreased or disappeared. The perspiration eliminates uric acid, and helps to clear the blood.

A copious draught of hot, strong coffee, taken on first awakening in the morning, prevents attacks in some cases at least. It quickens the circulation, starts the perspiration, increases the urine, stimulates the nervous centers, fortifies the power of resistance, and produces a sense of exhilaration and well-being. I have known this simple remedy to break up a series of morning attacks and to maintain freedom from them. If the over-wrought nerves are saved this morning seizure, they are far less likely to succumb to casual irritants during the day.

In very obstinate cases it may be necessary to resort to more potent remedies. There is one that has proved in my hands uniformly successful in giving relief, especially when given at the onset of the attack of hay-fever or coryza. Like the acid, it is for temporary use only. I have employed it for the past fifteen years or more, and published it repeatedly; but in this case it is, like old wine, the better for age. I refer to a combination of morphia and atropia, in the proportion of one part of atropia to fifty of morphia. The usual adult dose is from $\frac{1}{10}$ to $\frac{1}{8}$ grain of the mixture, according to the severity of the attack. It may be repeated in an hour or two if the first dose does not entirely relieve sneezing, hydrorrhea and stenosis. I have never known it to fail in stopping an attack when properly adapted to the case. No person has ever acquired the drug habit through my prescribing it. I never write a prescription for it, nor allow a patient to know the composition of the remedy—not for mercenary purposes, but in order to obviate the possibility of being responsible for the drug habit. The morphia clears the blood of uric acid, diminishes the nervous irritability, suppresses hypersecretion from the muciparous glands, and stimulates the circulation and activity of the nervous centers; while the atropia elevates the tone of the blood vessels, quickens the pulse, decreases all the secretions except the urine, sustains bodily temperature, stimulates the respiratory center, counteracts the constipating effect of the morphia, and acts as an antispasmodic.



FIGURE 1. Camenthol inhaler.

The camenthol inhaler (Fig. 1) has afforded hay-fever sufferers more relief than any other pocket inhaler with which I am familiar. It is more effective than menthol alone, and does not become irritating, as menthol crystals do after considerable use.

All patients seem to derive much benefit from the home treatment with a mild spray of camphor-menthol in lavoline. It is best to begin with a one-per centum solution, and gradually increase to the three-percentum. This preparation cleanses, covers and protects the mucous membrane. It contracts the capillary blood vessels, reduces swelling, arrests sneezing and irritation, checks excessive discharges, and corrects perverted secretions. Much comfort is afforded by the employment of this spray, at bedtime especially. Even the ten-per-centum solution can be used without ill effects by projecting the finest kind of a nebula by means of the hand dilator. I have seen a moment's treatment of this kind instantly stop violent sneezing and a profuse watery discharge.

The curative treatment should begin before the season of attacks. I am of the opinion that an excess of uric acid in the system is not due alone to continued retention and storage of the small normal overflow by the renal vein, but to an increased formation also. It follows then that it is necessary to reduce as much as possible the use of those foods that increase the actual formation of uric acid, such as meats, sweets, wines, beer, etc., and limit the diet largely to fruits, vegetables, milk, fats, etc. A diet of milk, with occasional very small quantities of egg and fish, with no other animal food, will prevent suffering from sick headache entirely, without medicinal treatment. With this diet the natural ratio between uric acid and urea — 1 to 33 — is maintained. Haig claims that by a uric-acid-producing diet one can store up in the body several ounces of uric acid in a few years, or by a correct diet not as many grains. He has been on such a diet over eight years, with almost never a headache. By eating meat and drinking wine two or three days in any single week he is sure to bring on the migraine.

It is a veritable hardship for some patients to be altogether deprived of meat, especially beef. They hunger for it like a toper for his grog. These people can be allowed nuts instead, for they take the place of beef to a large extent. The difficulty experienced in this substitute is that nuts are digested with difficulty unless very finely masticated. Even then they may cause gastric distress and flatulence. I have found an excellent preparation of nuts in bromose, which contains about the following percentages of these ingredients: maltose (digested starch), 21; nut fat (perfectly emulsified), 24; vegetable albumin, 19; dextrin and soluble starch, 17; salts, 2; water, 15. This furnishes the nutritive qualities of beef, and the nut oil provides the equivalent of butter. It is predigested and sterilized, and is practically bread, butter and meat combined.

Exercise aids in the excretion of uric acid, although there may be an actual increase in the amount of acid. A proportionately larger amount is eliminated.

A course of salicylate, salicin, lithium, etc., will remove the excess of uric acid. If an alkali is given it is likely to produce uricacidemia and precipitate an attack of the trouble we are endeavoring to prevent. For an attack, then, a dose of acid should be given to free the blood of uric acid; then the salicylate of sodium should be given for two or three days or longer to sweep it out of the body; but the salicylate should not be given during the attack, for it may aggravate the symptoms. For a month or two preceding the regular season of attacks, from two to six grains of the salicylate should be given every day or two, in order to get and keep the amount of acid in the body down to the normal amount. Instead of the salicylate, from six to twelve grains of lithium may be taken in very copious draughts of water two or three times a day. The carbonate powder is disagreeable, but the effervescent tablets of citrate of lithia are quite palatable when dissolved in an abundance of water. Each tablet contains three grains. After giving a fair trial of the various preparations, I have found Warner's tablets the most satisfactory. These are far superior to the so-called lithia waters. The claims made for some of these waters are somewhat amusing, since in order to get an ordinary dose of lithia one would have to drink 6,000 gallons. A long use of the lithia tablets seems to produce no ill effect; and this is fortunate for those who cannot take the sodium salicylate on account of its deleterious influence upon the ears.

This treatment, combined with proper diet, should be successful, provided that there is no organic disease of the structures, central or peripheral. Any organic disease—hypertrophy, polypus, etc.—must receive the necessary surgical treatment. A vitiated condition of the blood or a depressed condition of the nervous system must be corrected. Excesses of every nature must be avoided. All the organs of the system should receive such attention as to secure the harmonious co-ordination of their functions; for this treatment is directed against uricacidemia only as a cause of suffering, but it should not be forgotten that there are other causes that may operate to produce attacks, just as in the case of spasmodic asthma arising from bronchitis, irritating gases, and other excitants.

For the sake of convenience and accuracy of dosage I have had small tablets made, each containing morphia, $\frac{1}{12}$ grain; atropia, $\frac{1}{100}$ grain; and caffein, $\frac{1}{8}$ grain. They are known under the name of coryza tablets, for they are as efficacious in the early stage of acute rhinitis as in hay-fever.

When the pharynx, larynx and bronchi are involved I find the following tablets afford relief. They, as well as the others, are made for me by Truax, Greene & Co. Each throat tablet contains:

℞ Ammonii chloridi gr. ii.
 Tincturæ opii camphoratæ,
 Syrupi scillæ compositi,
 Syrupi tolutani āā ℥ v.
 Extracti glycyrrhizæ..... q. s.

M.

One or two of these cough tablets may be allowed to dissolve slowly in the mouth every hour until the irritation subsides.

I have not referred to hay-fever resorts, for the treatment outlined dispenses with the necessity for them.

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