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The Treatment of Bronchial Asthma

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THE TREATMENT OF BRONCHIAL ASTHMA.¹

BY FREDERICK I. KNIGHT, M.D.

THE term "asthma" has been applied to every form of dyspnea, paroxysmal or not, which is known to medicine.

What is properly so called at the present time is a paroxysmal difficulty in breathing due to temporary obstruction of the bronchial tubes.

The cause of this obstruction is now usually attributed to spasm of the bronchial muscles, or hyperemia and swelling of the bronchial mucous membrane, or both. In a certain number of cases the onset and termination of the attack are both so sudden and so free from catarrhal products as to indicate that it is purely spasmodic; on the other hand, in a much larger number of cases the preliminary cough and subsequent expectoration of Curschmann's spirals from the bronchioles indicate an obstructive affection of the bronchial mucous membrane.

The mechanism of an attack is varied, and much needless controversy has arisen from the fact that the discoverer of it in one case has too often endeavored to make this account for all other cases.

We have several factors to take into consideration in looking for the cause and later for a guide to the rational treatment of this affection. It may be due to one morbid condition, or to a combination of several. The principal conditions, which either alone or

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in combination, may be concerned in an attack of asthma are :

- (1) Disease of the lungs or bronchi.
- (2) Pressure on, or hyperesthesia of the vagus nerve.
- (3) Direct irritation of the bronchial mucous membrane.
- (4) Some peripheral morbid condition acting by reflex on the bronchi.
- (5) Toxemia.

Exactly how often an attack may be caused by one of these conditions, or to what extent a combination is always present, is not determined; but there is undoubtedly in a very large number of cases an abnormal condition of the lungs or bronchial tubes, which attracts the reflex. Hyde Salter and Berkart claim respectively that eighty and ninety per cent. of cases of asthma in the young date from some inflammatory affection of the lungs.

(1) Disease of the lungs or tubes, often the result of some acute inflammatory affection, makes the tubes prone to spasm or hyperemia. In case such morbid condition exists, the patient may probably have asthmatic attacks from this local cause of irritation without the assistance of any other factor, but is especially liable to attacks in case of the presence of either of the other factors at the same time.

(2) Longet, C. J. B. Williams, Lazarus and others have demonstrated experimentally that spasm of the bronchi could be produced by direct irritation of the lungs or vagus. So an attack of asthma may be produced by the pressure of tumors or enlarged glands on the vagus. Of course, an attack would be favored by a morbid condition of the lungs at the same time.

The phenomenon being produced through the nervous system, hyperesthesia of this system is naturally

oftentimes a factor in the production of it, though it is doubtful if there are any purely nervous cases, idiopathic, so called, in which no other factor is present except vagus-hyperesthesia. Certainly the cases in which we can discover no organic cause are becoming fewer and fewer.

In the few cases in which the exciting cause is psychic, other factors are, as a rule, probably present.

(3) The inhalation of mechanical irritants, dust, pollen, fumes of sulphur matches, etc., is the exciting cause in many cases. Some odors of flowers, animals, etc., act as direct irritants, others come rather under the toxic class.

(4) The sources of reflex from peripheral irritation are various, the nasal and gastric being best known, but may occur in many other regions. They may be traumatic. Nasal surgery, like that of other regions, has been wonderfully extended and improved in recent years, and many cases of asthma arising from irritation or obstruction in this field have been discovered and cured, and not unnaturally the nose has assumed an undue prominence as a factor in the production of asthmatic breathing.

Digestive derangements have long been known as excitants of the paroxysms, and are still potent.

(5) Under toxic causes we find the renal, gouty and malarial cases, as well as those due to carbonic acid, lead and other chemical poisons. The gouty and malarial origin has been too often overlooked. Some of my hearers may remember the cases of this kind reported by Beverly Robinson at the meeting of the American Climatological Association in this hall in 1889.

When we reflect upon this brief outline of some of the factors which may be concerned in producing an attack of asthma, it may be seen that the question of

treatment is by no means a simple one. The relief of the paroxysm may be easy, but the prevention of recurrence requires a careful study of possible causes, as indicated above.

Berkart in his monograph which calls attention to the large number of cases of asthma in which antecedent pulmonary disease will be found, says of his study of the affection that "little perspicacity is needed to discover that the prevailing obscurity in the nature and treatment, primarily and mainly, arose from the exclusive attention bestowed upon the dyspneal paroxysms, whereas their constant antecedents and sequelæ, which form the life history, as it were, of the disease, were either neglected or erroneously interpreted."

The treatment of the paroxysm, however, is often what first demands our attention. We will consider this first, and afterwards the treatment in the interval between the attacks, including the radical treatment of the underlying cause, when that is possible.

The first thing which demands brief consideration, when called to a patient in a paroxysm, is whether it may be possible to remove at once one of the factors, and thus perhaps put an end to the attacks. If the patient has had attacks before, he has probably learned to avoid direct irritants, like dust, odors, etc., which are most evident, so that it is not worth while to spend much time during a paroxysm in hunting for these; but some peripheral source of irritation by reflex may be seen at once, as, for example, a nasal polyp or an overloaded stomach, the relief of which will end the attack for the time being. So carbonic-acid poisoning may be relieved by exercise of the lungs in fresh air.

In most cases, however, some medical treatment will be called for. We probably cannot determine

at once whether we have predominant spasm or hyperemia and swelling of the mucous membrane, but practically the treatment of the one is not antagonistic to the other. The efficient remedies are those which reduce the irritability of the nervous system, relax spasm, thin the mucous secretion, and even produce a kind of bronchorrhea.

As any patient with asthma may have an underlying condition very difficult of removal, and may require frequent repetitions, at longer or shorter intervals, of the treatment of the paroxysm, it is important to use, unless absolutely necessary, only such remedies as may not incapacitate the patient for the next day's duties, and such as will not be likely to inaugurate the drug-habit. If there is evidence of an underlying condition of bronchitis it is well to put the patient on the internal use of potassium iodide at once. The simplest remedies, and those attended with the quickest relief, if relief comes at all from them, are those which are taken by inhalation. They all of them act more or less by exciting secretion, and most of them by relaxing spasm also. Some act well in one case, and some in another; and those remedies which have most success are usually combinations of various drugs. Nitrate of potassium, stramonium, belladonna, hyoscyamus and arsenic are found in variable numbers and proportion in most of the powders and cigarettes in the market. One drug or one combination affects one, and another, another; and only trial will decide which is best for any particular case.

If no relief comes from such inhalations then the milder internal remedies may be tried. Phenacetin and other remedies of its class may give relief. Strong coffee or hot alcoholic drinks may suffice. If necessary we proceed to less simple measures, such as

the inhalation of ethyl iodide, or the amyl nitrite, or the internal use of nitro-glycerin. The latter drug is very efficient in the relief both of spasm and of hyperemia. A large proportion of cases recover quickly on the combined use of potassium iodide and nitro-glycerin. Unfortunately the system soon becomes very tolerant of the latter, and the doses have to be constantly increased.

If still more powerful measures are called for, then those agents must be used which have a profound effect in diminishing the irritability of the nervous system. The hypodermic injection of morphia and atropia is one of the best, and will usually give relief, though I have seen a case, which always resisted morphia, yield readily to the inhalation of chloroform. The use of chloral, which often gives speedy relief, is to be avoided, if possible, on account of the very depressing after-effects. I must utter again a warning note against the use of any but the simpler remedies for the paroxysm unless absolutely required.

We now come to the treatment of patients in the intervals, to the treatment of the underlying conditions which, singly or combined, cause the attacks.

The first factor to which I have directed attention is the condition of the lungs and bronchi. As I have said, a previous inflammatory condition exists in many, according to some authorities in a very large majority of cases. In some we have physical evidence of a chronic bronchitis. It is in these cases especially that the potassium iodide gives so much relief, either as an absorbent, or as an alkali, increasing and thinning the bronchial secretion. Certain it is that this remedy when properly given relieves and cures more asthmatic patients than any other one. Sometimes, no doubt, the relief comes from its action on enlarged glands which compress the vagus.

The potassium iodide should be given in doses from five to sixty grains, if needed, for a thorough trial, unless contraindicated. The syrup of hydriodic acid is sometimes useful, but needs to be given in larger doses than those usually prescribed. The dose should be from a dessertspoonful to a tablespoonful. This is not nearly so efficacious as the potassium iodide.

In case of derangement of the stomach I have found the sodium iodide and strontium iodide better borne. I have lately used the latter a good deal, and find that it is much more acceptable to the patient. All of the iodides should be given largely diluted on an empty stomach. I usually give them ten or fifteen minutes before meals. The continued use of a vasomotor depressant, such as one of the nitrites either alone or with an iodide, when that is indicated, is of great benefit. Nitro-glycerin may be used, but the nitrite of sodium has a more lasting effect. The dose of this drug given in many books is too large, one or two grains being usually enough, and large doses dangerous.

In case of emphysema, strychnia is useful — also expiration into rarefied air.

The second factor on my list is pressure on or hyperesthesia of the vagus nerve. As I have said, potassium iodide may act favorably on enlarged glands which press on the vagus. The same is true of arsenic, which is also a good nerve tonic and is said to act favorably on the bronchial mucous membrane. Practically arsenic has shown itself of great value. Other nerve tonics are indicated, especially quinine, which in large doses may even abort a paroxysm.

The removal of the direct irritant is possible in many cases, and efficacious in preventing the paroxysms, though hyperesthesia of the nervous system may be a prominent symptom. Feather beds, animals,

kerosene lamps, arsenical wall-paper, various kinds of dust and many other objects, when found to be excitants, may be easily removed; but others cannot be, and yet it may be possible to remove the patient from them, as in the asthma of autumnal catarrh or other less defined climatic or atmospheric conditions. Certain regions of this country are known to be exempt from all of the symptoms of autumnal catarrh, asthma included.

In other cases the atmospheric condition which provokes the attack is not so well defined, and relief may be obtained only after repeated changes. The slightest change in location will sometimes give relief. More patients get relief by going from the country to the city than from the city to the country. A curious feature of the immunity of location is that in time it often fails, and another change is necessary. I remember the case of a physician who changed his residence and practice several times during his life, on account of asthma, and who finally got relief by going back to the place from which he started.

In making any change consideration must, of course, be paid to the probable effect of the climate on other factors, for example, on the condition of the lungs and bronchi and on the nervous system.

Of peripheral origin of reflex irritation the nasal region furnishes a good many cases, so many that the digestive and other important regions have recently been too little investigated. The nasal polyp is easily recognized, and so usually are other morbid conditions which are likely to set up reflex action. Contact of a turbinate bone with the septum may be a source of great irritation, less frequently chronic disease of the turbinates, tonsils, pharyngeal-adenoid, etc. The whole naso-pharynx must be put in as healthy a condition as possible.

As I have just stated, digestive derangements have been in recent years far too little considered. Indigestible food, especially when taken at night, is often the cause of an attack; though other factors may be present, it is this added irritation which determines the paroxysm. The digestive tract is so much under our control that it is very important to regulate the quality and quantity of food, and time of meals, and perhaps also to treat some evident morbid condition. The intestinal tract must be investigated, especially for parasites. The sexual system and possible trauma must be considered.

No study of an obstinate case is complete without the consideration of toxemia. Lead and arsenic should be sought, and especially should the lithemic condition be looked for. An anti-lithic diet, regimen and medicine will relieve many otherwise incurable cases. The same is true of the appropriate treatment of malarial cases. In cases of renal dyspnea due to uremic intoxication there is sometimes an apparent increase of suffering, due perhaps to spasm of the bronchi, as indicated by sonorous râles, but it is better not to consider these cases under the head of bronchial asthma such as we have been considering.

It will be seen from this brief sketch that many morbid conditions may be concerned directly or indirectly in the production of a case of bronchial asthma, which act singly or combined, and that the treatment should be directed towards the removal of as many as possible of these conditions. The result will be more satisfactory the nearer we get to a removal of all of them.

The more of these factors we can diagnose the simpler may be our treatment. Grand combinations of many drugs either for inhalation or internal use are to be avoided unless single remedies fail. Patent

and proprietary medicines and treatment of patients at a distance without examination for differential diagnosis must naturally be compound, including everything known to be "good"; but when a physician can have his patient under observation this can often be avoided.

In conclusion, I will add a few words in a general way as to the selection of a climate for asthmatics. As I have already said, the influence of climate is often very subtle, yet if we proceed on the same lines as I have suggested for medicinal treatment, of considering what factors we may influence by change of climate, we may yet often guide a patient successfully. Can we remove him from some direct irritant, as in the hay-fever cases? Shall we find a climate which will fortify or calm a hyperesthetic nervous system? Or shall we (which is perhaps oftenest required) put him in a climate which will act favorably on his bronchial inflammation? If we wish to do the latter, a dry, elevated region is indicated if the bronchitis is moist, but a warm, moist climate will probably be better if the bronchial mucous membrane is dry and irritable. As in all other means of treatment the nearer we get to an exact diagnosis of the exciting and underlying causes of asthma, the more intelligently and successfully will we be able to advise in regard to change of climate.

