TREATMENT IN GENERAL PRACTICE

This article is one of a series on the management of some of the major medical disorders met with in general practice

TREATMENT OF ACUTE BRONCHITIS

BY

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Bronchitis is often regarded as a minor malady. In reality, even in its milder forms, it often involves serious risks, particularly in the early or late periods of life. The care, management, and medicinal treatment of patients suffering from it should always receive the closest attention. A common fallacy is to expect recovery in a week or less. It often lasts longer than more acute and more immediately serious conditions, such as pneumonia.

Unfortunately, although the pathological basis of bronchitis as an infective catarrhal or suppurative process affecting the bronchi is definite and clear-cut, the clinical manifestations are varied and ill defined. Clinically the term "bronchitis" comprises conditions varying from a simple mild tracheo-bronchitis to grave involvement of the small bronchioles—a condition indistinguishable at the bedside from bronchopneumonia. In discussing the treatment of acute bronchitis it is therefore necessary to make some attempt to separate different clinical forms, at the same time premising that any of the mild varieties may merge into or progress to the gravest forms. It is also necessary to point out that bronchitis is often a secondary manifestation, either as an essential feature or as a complication of many other primary conditions, such as the infectious fevers, tuberculosis, glanders, and septicaemia, or after injury, anaesthetics, or gassing. Treatment in such cases may have to be subordinated to that of the primary condition or modified in various ways.

Although the general principles of treatment in the various forms are the same—namely, to combat the cause, whether mechanical or bacterial, to treat the inflamed mucous membrane, and to promote the evacuation of the products of the inflammatory process—yet the actual treatment varies with the degree and the extent of the inflammation. With the reservation that the classification adopted is chiefly clinical and in some senses artificial, we may for convenience recognize the following varieties:

1. Inflammation of the larger bronchi, or more accurately tracheo-bronchitis.
2. Bronchitis of the medium-sized tubes.
3. Inflammation of the bronchioles.
4. Suppurative bronchitis or "suffocative catarrh."
5. Fibrinous bronchitis.

A condition of fetid bronchitis has been described, but this is in most cases due to unsuspected bronchiectasis, or to bronchitis associated with empyema, abscess, or gangrene.

Tracheo-bronchitis

This condition is perhaps the commonest malady met with in family practice in these islands. Climatic conditions from the late autumn to early spring tend to promote the incidence of catarrhal infections, and the widespread neglect of elementary precautions favours their spread.

The best treatment is clearly that of prevention or protection. The common cold or infectious coryza which so often progresses to the conditions under consideration is the basis of the favourite gibe at the expense of our

profession—that we are supposed to be unable to prevent or to cure it. The facts are that patients too often regard it as trivial or negligible, and do not consult the practitioner till it has spread to the bronchi or lungs, when they quite rightly speak of a "neglected cold." A day—or perhaps two in severe cases—in bed at the onset of a coryza will usually tend to limit the process to the nasopharynx, and incidentally avoid spread to others by preventing the droplet infection, which the stage of sneezing is so peculiarly adapted to promote.

The value of prophylactic vaccines is still open to discussion and even to doubt, in view of the fact that the cause of upper air passage infections is probably a filter-passer. In my opinion, though vaccines may not prevent coryza and catarrhal bronchitis, they often serve to protect from the attacks or to mitigate them, and to avoid complications. The use of antiseptic applications to the nasal cavities is also one about which there is no consensus of opinion. I am not in favour of watery saline nasal douches, but I believe that solutions or suspensions of antiseptics and astringents in oil or liquid paraffin may be useful, such as adrenaline or chloretone inhalant, adrephine, metaphedrin, or ephregel.

TREATMENT

The patient should remain strictly in bed, though the decubitus should not be too flat, especially in older patients. The room should be well ventilated, free from draughts, and kept at a temperature not below 60° F. nor above 65° if possible. In the "dry" stage, when ineffective painful cough with retrosternal soreness is a prominent feature, the air of the room may be kept slightly moist by means of a steam kettle, placed well away from the patient. To each pint of water in the kettle five drops of oil of eucalyptus or terebene may be added, or some other volatile oil. Steam tents should not be used, as the object is to moisten the air slightly, not to make the neighbourhood of the patient damp and misty. A moist inhalation is, however, sometimes soothing, and the time-honoured friars' balsam, one drachm to the pint of water at a temperature of 140° F., is often soothing in this stage. The preliminary Turkish bath or hot bath is to be avoided unless the patient can go straight to a warm bed without exposure. A hot footbath, with or without mustard, may be comforting and useful, provided it can be given in the patient's bedroom.

Even though there may be little fever, the diet in the dry stage should be largely fluid, and solid food, for which as a rule the patient has little inclination, should be avoided. Milk, hot milk and water, milk and soda-water, jellies, beef tea, soups, custards, tea, and cocoa, to the total of two or three pints, with hot and warm demulcent drinks—such as hot lemon water, linseed tea, fruit *tsisanes* made by adding fruit syrups up to half an ounce to the pint, or glucose lemonade—may soothe the inflamed bucco-pharynx and shorten the dry stage in the trachea and bronchi. Marshmallow or glycerin and black currant lozenges are soothing. A hot or cold compress to the neck may be comforting. A mustard leaf over the sternum or rubbing in a liniment, such as liniment terebinth. aceticum, may also be helpful. A preliminary purge is usually advised, such as calomel at night followed by a saline in the morning—either a drachm of Epsom salts or sulphate of soda and water, or some effervescent saline.

The most useful medicines at the outset are saline diaphoretics and diuretics: for example, give six-hourly:

R	Pot. cit.	...	...	...	gr. xx
	Liq. ammon. acetat.	...	...	...	5 j
	Vin. ipecac. (tinct. ipecac.)	...	...	...	℥ x
	Syr. tolu.	...	...	...	5 j
	Aq. chlorof.	...	...	ad	3 j

For the first night at least it is desirable to give some soporific; 10 grains of Dover's powder is that most commonly employed, but codeine phosphate, grain 1/2 to 1, medinal grains 7, phanodorm 3 grain tablets, or heroin grain 1/12 may be used as alternatives. If prescribed on subsequent nights after the first they should be stopped at the earliest opportunity.

In cases with severe pain or with much dry ineffective cough, 3 minims of vinum antimoniale may be added to the diaphoretic mixture or substituted for the vinum ipecacuanhae. Apomorphine is also useful in this type of case, and may be given in the form of syrup. apomorphinae co. (B.P.C.) in 1-drachm doses every six hours for four doses. Each drachm contains 1/36 grain of apomorphine. One-drop doses of tincture of aconite in water were formerly recommended in such cases, especially if there was much fever. When the dry stage gives place to copious expectoration of mucoid material, and later of muco-purulent sputum, simple expectorant mixtures may be given every six hours, such as:

R	Vin. ipecac.	...	...	...	℥ x
	Tinct. camph. co. (tinc. opii camph.)	...	...	...	℥ x-℥ xv
	Syr. tolu. (or syr. pruni virgin.)	...	...	...	5 j
	Aq. chlorof.	...	...	ad	3 j

In elderly patients at this stage ammonium salts may be helpful in the form of either the chloride or the carbonate.

R	Ammon. carb.	...	...	...	gr. iv
	Vin. ipecac.	...	...	...	℥ x
	Syr. tolu.	...	...	...	5 j
	Aq. chlorof.	...	...	ad	3 j

Stimulants are not necessary as a rule unless patients are accustomed to them, when usually small amounts may be allowed. In the later stages patients are often left with a troublesome and persistent cough, particularly at night and in the early morning. This is frequently due to some residual tracheitis, and may be relieved by elixir diamorphinae et terpini c. apomorphina (B.P.C.) in 1-drachm doses. Each drachm contains 1/40 grain of diamorphine, 5/18 grain of terpine, and 1/32 grain of apomorphine. Collosol bromoform co. in 1-drachm doses may also be helpful, or some similar proprietary preparation. If cough persists in spite of treatment the nasal sinuses should be investigated and the sputum be examined for tubercle bacilli. If these prove negative a simple acid tonic mixture may be tried, such as:

R	Liq. strych.	...	...	...	℥ iij
	Acid. phosph. dil.	...	...	...	℥ x
	Syr. aurant.	...	...	...	5 j
	Aq. chlorof.	...	...	ad	3 j
	t.d.s., p.c.				

The most effective convalescent treatment is often afforded by a few days at a coast resort.

Bronchitis of the Medium-sized Tubes

The clinical manifestations begin as a rule like those of tracheo-bronchitis, but the fever and systemic disturbance are greater and the local symptoms and signs more severe. The same general management, diet, and treatment should be employed at first. Depressant expectorants like antimony and apomorphine should be avoided, except

perhaps in the earlier stage of dryness of the mucous membrane.

Stimulant expectorant mixtures may be prescribed as soon as the cough becomes loose, such as:

R	Ammon. carb.	...	...	...	gr. iij ad v
	Pot. bicarb.	...	...	...	gr. x
	Tinct. scillae	...	...	...	℥ x
	Syr. tolu.	...	...	...	5 j
	Aq. chlorof.	...	...	ad	3 j

In patients with bronchial spasm or with asthmatic tendencies, potassium iodide in doses of 3 to 5 grains may be added to this mixture, and 5 to 10 minims of tincture of stramonium or of tincture of belladonna.

A careful watch should be kept on the pulse and blood pressure. Digitalis may be added in suitable doses or Nativelle's digitaline given. Coramine may be taken by the mouth or hypodermically in doses of 1 c.cm. from once to four times a day. If cyanosis or dyspnoea develops oxygen should be administered at once. The most suitable method and the most economical is the continuous administration by a No. 9 nasal catheter or by a special rubber nasal plug. The oxygen cylinder should be fitted with a fine adjustment, and the oxygen should be bubbled through warm water in a Woulfe's bottle at the rate of three to five bubbles a second.

After the first night or two special care must be taken in regard to the use of hypnotics, especially those like opium, morphine, heroin, and codeine, since they tend to lull the cough reflex. It is important, especially in elderly patients, to avoid accumulation of bronchial exudate, particularly at the bases of the lungs. It is sometimes useful to give first thing in the morning the well-known Brompton Hospital "hot-water mixture":

R	Sod. chlorid.	...	...	...	gr. iij
	Sod. bicarb.	...	...	...	gr. x
	Sp. chlorof.	...	...	...	℥ v
	Aq. anisi	...	...	ad	3 j

This should be taken in an equal quantity of hot water.

Alteration of position is to be advised in these cases. The patient should have a bed rest or extra pillows, and not be allowed to slip down in the bed. Counter-irritants and hot applications to the skin are frequently of use in this condition. The acetic turpentine liniment is pleasant, and not unduly rubefacient. Antiphlogistine may be applied, or poultices or turpentine stupes. These should be applied to the back and side, and but rarely to the front, owing to the fact that the weight impedes inspiration. The Gamgee jacket, formerly so popular, is, I think, of little use, and often causes discomfort by promoting undue sweating. Stimulants are more often necessary in this type of case.

Inflammation of the bronchioles or capillary bronchitis is a condition which is indistinguishable clinically from bronchopneumonia, and should be treated as such.

Acute Suppurative Bronchitis or Suffocative Catarrh

This condition, though rare, is grave, and is usually due to the pneumococcus. In general its manifestations are similar to those of bronchopneumonia, but cough with copious expectoration, marked dyspnoea, and extreme cyanosis develop very rapidly, while dangerous prostration is a very early feature.

The treatment is similar to that for severe bronchitis of the medium-sized tubes, but oxygen inhalation should be started early; stimulant expectorants should be given freely. Digitalis may be necessary from the start, and coramine may be administered up to 1 c.cm. every four to six hours, either by the mouth or hypodermically, or

even intravenously. Pituitrin, adrenaline, or ephedrine may be prescribed if the blood pressure falls. If marked cyanosis develops early and the heart is beating forcibly, venesection may be tried to the extent of ten to fifteen ounces. If the bronchitis is due to the pneumococcus, and this can be typed, Felton's serum may be injected if the organism proves to be either Type I or Type II. Skilled nursing with careful observation of changes with regard to pulse, colour, position, and cough, are of great importance in all cases of severe bronchitis.

Fibrinous or Plastic Bronchitis

This condition, though rare, may easily be overlooked. In all cases with cough and sputum, especially where cough is violent and paroxysmal, and where there are signs of local collapse of the lung, the sputum should be poured into water in a large transparent glass vessel. In this condition characteristic tree-like casts may be recognized. The treatment is similar to that for severe bronchitis. A mixture containing iodide of potassium and antispasmodics like belladonna and stramonium should be used. Lime-water and olive oil by intratracheal injection have been recommended, but are of doubtful value.

ANNUAL CONGRESS OF RADIOLOGY

The eighth annual congress and exhibition of apparatus under the auspices of the British Institute of Radiology was held at the Central Hall, Westminster, on December 5th and following days. Two medical sessions were held, also a session for papers on physical subjects, and two memorial lectures were given, one by Sir William Bragg on "X Rays in the Study of the Coarse Structure of Materials," and the other by Dr. H. H. Berg of Dortmund on "The Digestive Mucosa." The crowded exhibition included many installations of self-protective shock-proof x-ray apparatus, motor-driven movable tables for diagnostic work, new sets for deep therapy, and ultra-short-wave installations.

PHYSICIST AND RADIOLOGIST

Sir HUMPHRY ROLLESTON, in opening the congress, said that the art of medicine was inspired by applied science, but carried on with due consideration for the special circumstances of the individual patient. This might seem a truism, but it was often forgotten. Undoubtedly it was scientific to remove, destroy, or neutralize the cause of disease, but if this were carried out regardless of the patient the result might be disastrous. Radiological treatment of cancer was in some degree exposed to this danger; the patient and his individual circumstances were liable to recede into the background and treatment to be directed solely to the malignant growth. The relation of the pure physicist to the medical radiologist somewhat resembled that of the bacteriologist in the laboratory to the physician in the sick-room. The medical radiologist should not demand too much of the physicist. Each of the two parties had his own field. The proper dose of radiation and the mode of its application were in the province of the medical radiologist, and the role of the physicist was to supply data bearing on those problems which the medical radiologist must finally settle.

ARTIFICIALLY INDUCED RADIOACTIVITY

One of the most interesting demonstrations was by Professor F. L. HOPWOOD of St. Bartholomew's Hospital, on induced radioactivity. He began by reading a sentence of remarkable prescience from H. G. Wells's *The World Set Free*, published in 1914, in which Wells prophesied that the problem of inducing radioactivity in the heavier

elements, and so tackling the internal energy of atoms, would be solved by a wonderful combination of intuition and luck in 1933. And in fact it was in 1933 that Mme Curie's daughter, Mme Curie-Joliot, and her husband demonstrated the phenomena. Professor Hopwood reminded the congress of what had already been shown by Rutherford and others to occur on the bombardment of the nucleus of a stable atom, causing it to become unstable and to emit a disintegrating particle. This idea had been carried further in the Curie laboratory. If beryllium, for example, were irradiated by gamma rays or x rays of suitable voltage, this metal gave off neutrons, which, being allowed to fall on bromine, rendered it temporarily radioactive. Recently some bromine which had been treated in this way was sent by aeroplane to Professor Hopwood's laboratory from Berlin, and here its radioactivity was found to persist and its period was measured—the first time, he thought, that radioactivity had been induced in a substance in one country and demonstrated in another. The elements to which the radioactivity was imparted had various periods, the half-life activity being in some cases thirty minutes, in others six hours. Many of the elements occurring in the human body could be transmuted temporarily into radioactive substances; the only notable exceptions were hydrogen and calcium. Substances commonly used as drugs, such as manganese, could be similarly treated. By means of a very delicate "counter," connected to a telephone which emitted clicks as the stream of electrons arrived, Professor Hopwood demonstrated induced radioactivity in aluminium and silver and other materials, including, thanks to its phosphorus, an elephant's tusk. He believed that within a few years materials to which this transient radioactivity had been imparted would be available for transmission from laboratories in quantities suitable for therapeutic purposes. Whether they would prove desirable in therapeutic use remained to be seen, but it seemed to him that a vast new field of therapy was being opened up. There was one great advantage in the artificially induced radioactive elements over naturally occurring radioactive elements—namely, that they quickly died or transformed to some stable element, so that a dose could be repeated indefinitely and an uncertain amount of radioactive material would not be accumulated in the body.

CONSTITUTIONAL EFFECTS OF X RAYS

A joint paper by Dr. S. GILBERT SCOTT and Dr. F. HERNAMAN-JOHNSON on the constitutional effects of x rays as determined by blood-serum tests was presented by the latter. It was extremely probable, said the authors, that x rays, like ultra-violet light, had constitutional as well as local effects. In the case of ultra-violet light, however, a knowledge of its physical properties made it reasonably certain that constitutional action could only be through the skin, and this narrowed the investigation to chemical changes in the surface tissues. All these possibilities were present in x-ray action also, but many more, for even with x rays of medium wave-length there was not an organ or tissue in the path of the beam which might not be affected. Clinical radiology had so far concerned itself mainly with direct action, but a study of constitutional or indirect effects might yet yield results of great value, perhaps in unlooked-for directions. Recently the vanadic acid blood-serum test, originally introduced by Bendien for the diagnosis of cancer (for which purpose it had not yet been proved reliable), had shown itself of great value in the control of x-ray treatment, indicating constitutional reactions to x rays and the state of the patient's resistance. Asthma was the first condition to be investigated on these lines. The fact of over-dose could be recognized from the serum picture. These allergic patients were very sensitive to radiation, and the