TREATMENT IN GENERAL PRACTICE

This article is one of a series on the management of some of the rheumatic diseases met with in general practice.

PHYSICAL METHODS OF TREATING RHEUMATISM

BY

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PART II

Radiant Heat

For general applications of radiant heat the patient sits or lies in a cabinet containing about forty-eight incandescent light bulbs arranged around its interior. The duration of the treatment is from fifteen minutes to half an hour. For local applications a large, high-powered lamp is generally employed, known as the "leucodescent lamp." It can be placed over any part of the body, and is much used as a prelude to massage. If neither of the above is available an excellent substitute can be provided by making two bricks red hot in a fire and placing them at the bottom of an old bucket. Over this a limb may be supported, covered by blankets; a knee, elbow, wrist, ankle, foot, or hand can thus be exposed to infra-red rays, which are just as efficacious as those derived from a more expensive electrical apparatus. Radiant heat or "infra-red therapy" differs from the methods of supplying heat that have so far been considered in that the transfer occurs between two bodies that are not in contact.

The skin is quickly reddened and a profuse flow of sweat ensues, but as this is quickly evaporated there is practically no rise of internal temperature. With the relaxation of the cutaneous vessels there is a general movement of blood and lymph from the deeper to the more superficial structures. Radiant heat is mostly employed for its direct analgesic effects. It is very valuable in neuralgic conditions; in fibrositic affections, such as lumbago and other painful muscular conditions, the addition of massage is often most effective, particularly in the later stages.

Electrical Treatment

The continuous or galvanic current is derived either from chemical batteries arranged in series or from a pantostat supplied from the main. The electrodes through which the current is applied to the body are generally made of metal plates covered with some absorbent material which can be kept constantly damp, as dry skin is a bad conductor. The active electrode is applied by the operator to the area to be treated. It is fitted with a handle in which is a key for opening and closing the circuit. The indifferent electrode is fixed in any convenient spot and kept in apposition to the skin by the patient's clothing or by a bandage.

To avoid painful shocks from sudden interruptions the current should be very gradually increased and diminished by means of a mechanical device whereby its strength can be made to increase and decrease in slow rhythm about once in every three seconds. As this is accomplished without any sudden jerks, fairly strong currents can be used without causing pain; with the current at its strongest a tetanic contraction of the muscle squeezes the

blood out of the tissues lying between the electrodes; with the diminution of the current the vessels are again filled with blood ready to be emptied at the next contraction. The galvanic current stimulates muscle fibres without the intervention of the nerve, differing in this respect from the faradic current. A contraction can thus be evoked when the nerve is in a state of degeneration.

ANODAL GALVANISM

Galvanism is mostly used for its sedative effects. To obtain these the positive electrode is placed at the extremity of the affected limb with the negative towards the nerve root. This is known as "anodal galvanism," and its sedative action is explained by the hyperaemia induced by the current being more pronounced near the anode or positive pole. As sensory nerve endings are stimulated by chemical or physico-chemical changes, pain produced by the arrest or diminution of the blood flow may be relieved by any measure that increases the circulation in the part concerned. The pain of neuralgia, neuritis, lumbago, sciatica, and other conditions of undetermined origin can frequently be greatly diminished, if not abolished, by the employment of anodal galvanism. The best results are obtained from weak currents—up to 10 milliamperes—with large electrodes.

IONIZATION

An electrolyte is a substance which in solution conducts an electrical current and is decomposed by its passage; from the point of view of electrical conductivity the tissues of the body may be regarded as an electrolyte. The passage of an electric current through an electrolyte such as the bodily tissues or a saline solution causes the ions to move in different directions according to whether they carry a positive or a negative charge. This ionic movement, induced in an electrolyte by dipping into it the positive and negative electrodes connected with a source of electric supply, is made use of in ionization, or iontophoresis, for the introduction of various medicaments into the skin and subcutaneous tissues.

Strong currents—up to 50, 60, or even 100 milliamperes—are required; a very weak current—10 milliamperes—is used to begin with, and gradually increased to the amount desired. Plate electrodes covered with one or two layers of felt are employed. Between the felt and the skin are placed several folds of cotton cloth or linen, well soaked in the solution to be used. The strength of the solution is only from 1 to 3 per cent., the amount of absorption of metallic or other ions depending not on the strength of the solution but on that of the current. Metallic substances and some alkaloids—ammonium, calcium, gold, lithium, mercury, potassium, sodium, strychnine, quinine, etc.—are introduced at the positive and liberated at the negative electrode, and are known as "cations"; while acid radicals—nitrates, phosphates, and sulphates, along with bromine, chlorine, iodine, and salicylic acid—are introduced at the negative and liberated at the positive electrode, and are therefore called "anions."

Salicylic ionization is useful in sciatica, brachial neuritis, and many other painful conditions in and around the

joints. Chronic gouty arthritis is often greatly benefited by immersing the limb in a bath with a lithium salt at the anode and salicylate of soda at the cathode. It gives excellent results in chronic synovitis and in villous arthritis. The iodides of potassium and lithium are also employed in very much the same conditions. Ionization with salt solution sometimes helps stiffened joints. Histamine ionization is being extensively applied at present for all manner of painful affections of the peri-articular tissues, and is meeting with the usual success that accrues to anything new.

FARADISM

Faradic coils for therapeutic purposes require a current of 0.3 to 0.8 of an ampere, and from 1.5 to 3 volts. The intensity of the current is regulated by means of the iron core of the coil; when this is fully drawn out the current can hardly be felt, but when pushed well home the same current may be very painful. The number of interruptions of the spring can be regulated by means of the contact screw.

The faradic current, having no sedative effect, is not used for the relief of pain. It is mainly employed, so far as rheumatic conditions are concerned, in improving the condition of wasted muscles in the neighbourhood of arthritic joints. A very good example of its value is in the treatment of a wasted quadriceps extensor muscle in a case of arthritis of the knee. It is also employed in the same way for wasting of the arm muscles in arthritis of the shoulder. It is, however, important to remember that no amount of faradism will restore a wasted muscle if the joint it controls is immobile.

DIATHERMY

A high-tension alternating current used for commercial purposes or in the electric light mains changes its direction from positive to negative and vice versa with a frequency of anything from fifty to 500 times a second. The passage of such a current through the human body would be attended by a fatal result. By increasing the frequency of alternation and density to such a pitch that the living tissues do not attempt to contract under each impulse the current can be employed for therapeutic purposes. This means that the rate of oscillation, or change of polarity, must have a frequency of millions of times a second. With the passage of a current of such frequency the resistance offered by the tissues intervening between the electrodes causes heat to be generated. If the current passes in straight lines through a limb those parts which offer the greatest resistance will be heated most. For example, a highly resistant part of the body, such as the forearm, can have the path of the current which is traversing it heated up to the limit of tolerance with a quarter of the amperage that can be passed through the abdomen.

For the administration of diathermy flexible metal electrodes are used under which moistened lint or gauze is placed. The electrode must fit the skin and there must be no corners or sharp edges, otherwise burns may be caused. A fatty soap should be employed for lathering the skin so that the plates fit closely; a web elastic bandage keeps them in position. A cotton bandage is apt to tighten with the swelling induced by the arterial hyperaemia. The electrodes must not be allowed to dry in any part, as a greater resistance is offered which at once raises the heat in that particular spot. A sensation of burning or smarting is a warning that something is wrong. A safe limit of dosage is 1,000 milliamperes on an electrode surface of four by four or two by two inches. This dose may be and often is exceeded if the treatment is given by one skilled in its application. The duration is usually from twenty minutes to half an hour.

Diathermy is a valuable analgesic measure. This is no doubt due to the well-known effects of heat. It is claimed, but no proof is forthcoming, that the rapidly oscillating electromagnetic waves may have some influence in this connexion. The production of hyperaemia and the acceleration of the flow of lymph facilitates the absorption of exudates and the dispersal of inflammatory patches. It is useful in the treatment of the later stages of interstitial neuritis of the components of the brachial, lumbar, or sacral plexuses. In the earlier stages it is perhaps not so successful, because by increasing the hyperaemia of an already inflamed nerve trunk the pain may be intensified.

It is a reliable measure in the treatment of a vast number of articular affections; osteo-arthritis of the hips, knees, or spine, and villous arthritis of the knees may be mentioned as examples. It is also employed as a direct application to the prostate or cervix in cases of infective arthritis in which the causal organism is thought to be located in those situations.

Massage

Massage in the form of light stroking, or "effleurage," is a sedative treatment, and can be applied in the early painful stages of a neuritis or fibrositis. The movement is carried out by the entire palmar surface of both hands for large areas, while on a limb the fingers and inner sides of the thumb are used with a firm, flexible grasp. The stroke is in the direction of the venous and lymphatic flow with very light pressure at its middle; contact with the skin should not be lost. About fifteen or twenty strokes to the minute should be given and the séance should last about a quarter of an hour.

In treating the later stages of fibrositis the object is to break up inflammatory patches of tissue and exudates, which have organized into bands and adhesions, and are not only a cause of pain but seriously limit the movements of joints. The "nodules" that are so graphically described in much of the current literature are not commonly present, and when they are they rarely cause any pain. What should be looked for are not hard, pea-like nodules, but tender inflammatory patches over which the muscular fibres are in a state of protective spasm. The dispersal of these bands and patches is a painful business, and is best carried out pressing the muscle against the underlying bone if it is conveniently situated for such a manoeuvre. What is called "oil massage" is useful—that is, instead of using talc powder, oil is employed as a lubricant. Besides actually breaking up the exudates massage has an undoubtedly beneficial effect on the peripheral circulation—arterial, venous, and lymphatic. According to Pemberton part of the syndrome of the rheumatic state is a stasis in capillary areas with consequent deficient oxygenation of the tissues. Not only is the blood flow markedly increased by massage, but there is a rise in the red cell count. There is little doubt that fibrositis is associated with stasis in the lymph channels, and is what makes the combination of heat with massage so valuable. In cases of more or less generalized fibrositis or "panniculitis" the employment of underwater massage is often followed by very good results. It is simply carried out by giving massage to the limbs of a patient who is lying in an ordinary bath at a temperature of 102° F.

In treating atrophic conditions of a limb, when associated with arthritis, massage alone is not nearly so effective as when combined with some other measure such as faradism or the sinusoidal current. In performing massage in these cases it is often of advantage to have the hand of the operator in the electrical circuit, thus giving the so-called electrical massage. It cannot be too strongly

emphasized that unless a joint is capable of some movement massage to the muscles which control it is a waste of time. A muscle can only be restored to a normal state if it is performing its natural work. In the same way no joint can possibly be maintained in a healthy state unless it carries out its normal function of movement.

Manipulation

There is no branch of physical treatment that requires more discrimination than the application of active and passive movements to joints that are, or have been, the seat of some inflammatory process. First, what is the limitation of movement due to—muscular spasm, thickening of the capsule of the joint, or actual interarticular changes such as fibrous or bony ankylosis? To ascertain this an *x*-ray examination is essential.

Having determined that an increase in mobility is practicable, the question then arises whether this should be secured at one sitting, under an anaesthetic, or be accomplished gradually at many. Speaking generally, the latter is to be preferred, as forcible mobilization is very apt to set up fresh trouble by breaking down adhesions too quickly. In the selection of suitable cases it must be

remembered that a joint which is the seat of active inflammation should not be moved. Rest with the joint splinted in the optimum position is the best treatment. If after cautious mobilization the range of movement in the joint is lessened, that may be taken as fairly certain evidence that inflammation is still present. On the other hand, if after mobilization the range of movement remains increased there is every encouragement to carry on until the full range is obtained.

Cases of osteo-arthritis show perhaps the best results from manipulation. These cases are primarily degenerative, not inflammatory, and by perseverance mobility can often be obtained in joints that appeared almost hopeless. Patients with rheumatoid arthritis should always be encouraged to perform all the active movements they possibly can. The fingers especially should be put through all their normal movements every day. If as a result of movement a joint becomes inflamed it is rested, but an early attempt should be made to repeat the movement. A hot bath is very helpful in the performance of movements at the knee, ankle, or foot joints. Muscular spasm is relieved and the weight of the limb is lessened by the buoyancy of the water.

SOME COMMON DISEASES IN INFANTS AND CHILDREN*

BY

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The Wasting Infant

Wasting in infancy is a common condition and often a source of much anxiety to the parents and physician alike. The organic causes most commonly found are pyloric stenosis and congenital heart disease. The main features of the former condition are so familiar that it is unnecessary to say much about it. The infant, generally a boy and often the firstborn, begins to vomit at the age of 2 to 3 weeks. The vomiting gradually becomes forcible and the infant loses weight rapidly, although he takes the feeds greedily—unlike the baby with gastro-intestinal trouble. Peristalsis across the upper abdomen is best seen during or after a feed, when the stomach is full, and if much patience is exercised the pyloric tumour may be felt.

Congenital heart disease must be diagnosed on hearing any marked bruit over an infant's cardiac area. This is a serious handicap to the infant, and progress is always slow. The infant is not always cyanosed, but if it is the outlook is even worse.

Premature infants, too, have a poor hold on life and a feeble power of digestion. As Robert Hutchison says, they are an "extravagant machine," needing a large amount of food to maintain the body temperature as well as for the purpose of growth. The premature infant is also often too weak to suck, which adds to the difficulty, and it is no wonder that so many of these infants do not survive.

Underfeeding is a common cause of wasting, and is, of course, easily remedied. The baby is fed on too dilute feeds, and in consequence becomes cross and unhappy. Often the feeds are then weakened still further, as it is thought the baby has colic or indigestion. It is common to find a wasted baby being fed on barley water, and it is remarkable how long life can be maintained on such a diet. Another cause of starvation is a teat with too

small a hole in it, so that the infant soon gets too tired to continue sucking, for it takes considerable force to draw the food through a tight teat. Congenital adenoids, which block the nose and interfere with feeding, should be removed at once.

Infants who are always crying with flatulence and colic are a common sight. They are usually nervy babies, who sleep badly and wake at the slightest noise. The condition quickly becomes a vicious circle, the dyspepsia and crying reacting on one another. They are also liable to loose stools, and become most difficult to deal with. The nervy, worried mother is not the best person to look after them, and, if there is a nurse in charge, often interferes.

Prognosis

The outlook is always doubtful in any wasted infant, and changes for the worse are apt to take place even though there has been response to treatment for a time. On the other hand, it is remarkable how often, even after a long standstill, the baby gradually begins to gain weight. One of the best signs, apart from a gain in weight, is when the infant takes more notice of those around him and begins to smile—always a good omen.

Treatment

Above everything the baby needs good nursing and what one would call mothering—that is, he is not to be left alone in the cot too much, and he needs nursing in the arms at intervals during the day. It is important that anyone with a "cold" must be kept away, to avoid infection. Warmth is essential, and one of the most successful nurses I know keeps the room at a very high temperature, summer and winter, with excellent results. It is also a mistake to take a delicate baby out of doors too soon. Cleanliness and frequent changes of soiled napkins are important. Regular weighing on proper scales is essential, though this must not be made too much of, for many wasted infants gain one week and remain stationary the next, much to the disappointment of the mother. A food rather poor in fat but with high carbohydrate is often best, such as half-cream Cow-and-Gate brand, or a weak milk-and-water mixture. For the very poorly infant sherry whey is valuable, and is taken well. Later on, if all is going satisfactorily, one

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