EARLY MANAGEMENT OF POLIOMYELITIS

BY

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Now that the summer polio season is upon us, it may not be inappropriate to reconsider our attitude towards the management of the early stages of the disease. The need for wise management begins as soon as the patient is suspected of being infected, and therefore the first and probably the most important part takes place in the patient's home.

Suspected Cases

In the very earliest phase, when the patient has a non-specific febrile disturbance associated with headache, vague sore throat, and general malaise which, because of the season and perhaps also a doubtful history of contact, is feared to be a possible poliomyelitis infection, all that can and should be done is to confine the patient to bed and keep him there until the position becomes clearer. Aspirin, perhaps combined with codeine, may diminish discomfort, and all toilet procedures must be carried out in bed. The majority of these patients will never develop any further symptoms. When their temperature has been normal for three or four days, they can be allowed up for increasing periods, but full activity should not be allowed for another week. However, a few patients will proceed, sometimes after a latent period when the temperature abates and a feeling of well-being returns, to develop signs of meningeal irritation. The diagnosis now becomes more certain, and there may be a natural desire on the part of the family doctor, aided by pressure from the relatives, to send the patient to hospital. This course must be firmly resisted. It should be made quite plain to the family that there is no specific treatment for poliomyelitis and that hospital admission has nothing to offer the patient which cannot be done in the ordinary decent home. This should be emphasized because so often the parents and relatives, and occasionally the doctor himself, believe that something can be done in hospital which may make all the difference to the patient's chances. In many instances the reverse is true, and particularly where children are concerned home-nursing avoids the emotional disturbance, the irritability, fretfulness, crying, and restlessness which separation entails. In addition, the physical stress of ambulance journeys is avoided, for in some instances this may be a deciding factor in initiating paralysis. Another advantage of home-nursing is that it reduces unnecessary strain on the nursing staff of hospitals which are usually busy at this time of year.

Contacts

When the patient is nursed at home the parents will need to be reassured that this will not increase the risk to other members of the family. The experience gained so far in the Newcastle area, where the policy of domiciliary care of selected cases is encouraged, suggests that family infection will already have occurred before the patient comes under medical supervision, and that secondary cases are no more frequent in the family if the patient is kept at home than if he is sent to hospital. Adult contacts of the case are allowed full freedom of movement, but are advised to avoid crowds and excessive exertion for at least a fortnight and not to mix too intimately with children.

Schoolchildren are by regulation excluded from attending school for three weeks, although the value of this in a thickly populated urban district is not very obvious, especially as free mixing with other children is bound to occur after school hours in spite of the so-called "home and garden" quarantine which is hopefully instituted. Avoid-

ance of exercise, which is so important should infection already have occurred, should be insisted upon and any deviation from full health should mean bed and a visit from the doctor.

Where quarantine restrictions cannot be enforced by law, they should be sufficiently reasonable to command assent from the family and other contacts. Such, though they may fall below the theoretical optimum, are more likely to be honoured than more rigid restrictions which are plainly impracticable. In sparsely populated areas where the chain of infection can often be traced, more rigid quarantine measures may be both justified and successful in limiting the spread of infection, but again they must not be too harsh.

Indications for Admission

In pursuing the policy of home-nursing wherever possible, it has gradually become apparent that there are certain indications which make admission to hospital advisable or imperative. These are as follows:

(1) Where the home conditions are so deplorable that nursing any sick child under such conditions is unwise. These conditions continue to exist largely as a result of parental incompetence, limited parental intelligence, the structural inadequacy of certain homes, and serious overcrowding.

(2) In order to establish a diagnosis. Admission for this reason may occasionally, though rarely, be necessary, but this should not be used as an excuse by the doctor to get the patient into hospital and so rid himself of any further responsibility. Where reasonable doubt exists as to the presence of pyogenic or tuberculous meningitis, examination of the cerebrospinal fluid is essential and should be done only in hospital.

(3) Bladder-disturbance requiring catheterization. This may be only a temporary inconvenience, but, unless the home is exceptional and nursing help available, it is not to be expected that such procedures should be carried out by the family doctor or any member of the family. Occasionally catheterization may be necessary for two or three weeks.

(4) Extensive paralysis of the limbs or back which make home-nursing too difficult under ordinary circumstances.

(5) Weakness of the shoulder girdles which may precede involvement of the diaphragm.

(6) Difficulty in swallowing or breathing.

Once admitted, the management in hospital will depend on the clinical course of the disease.

Ordinary Spinal Case

This is the patient with paralysis of arms, legs, and back, either separately or in combination. On admission only minimal examination of the muscles should be carried out, the keeping of detailed muscle-charts is not necessary, and in the early stages the less handling of the patient the better. By the same token, routine lumbar puncture should not be performed; the condition of the cerebrospinal fluid is only of academic interest in the case which can be diagnosed by clinical examination; it gives no help with prognosis, and the fluid is normal in at least one-fifth of all hospital cases, even if the most severely paralysed are included. Absolute rest must be maintained and natural sleep encouraged. If there is no danger of bulbar or respiratory involvement, sedatives may be given. Muscle-spasm, which may be very painful and distressing, can be diminished by the application of heat from hot-water bottles, electric pads, or even radiant-heat cradles. Occasionally aspirin, quinine, or morphine may be necessary. The affected limbs do not require splinting at this stage, and sand-bags, slings, bed cradles, a footboard, and a firm mattress will be found sufficient to support paralysed muscles and maintain the limbs comfortably in the optimal position. Passive movements should be prohibited until the temperature has settled for a few days and muscle-spasm gone. Cautious and carefully controlled active movements may then be allowed; too early exercise is harmful. The bowels must be kept active by enemata to prevent the patient straining

and to avoid the inevitable faecal impaction which otherwise develops. Antibiotics are used only for cases needing catheterization or where secondary infection has occurred or is likely, such as lung sepsis in respiratory or bulbar involvement.

Bulbar Paralysis Alone

The dangers here are due to inability to swallow and cough, with consequent pooling of mucus in the pharynx and its aspiration leading to collapse of the lung and asphyxia. Tracheotomy is not usually needed unless spasm or adduction of the vocal cords produces obstruction to the airway. For the straightforward type of case nursing techniques are all that are required. The prone or semi-prone position to facilitate postural drainage is achieved by raising the end of the bed or by means of an inclined plane or cardiac bed, the head being turned to one side to allow secretions to drain out naturally. Intravenous fluids may be required initially to correct dehydration, but tube-feeding thereafter will usually suffice, the patient being laid supine and left in this position for half an hour after a nasal feed, and then replaced in the prone position. Mechanical suction may occasionally be necessary in the first few days, and should be done very gently and with a minimal negative pressure to prevent damage to the buccal mucosa. Once the power to swallow starts to return, feeding must be carefully supervised. Initially semi-solids are managed most easily; fluids should not be offered until recovery is well advanced.

Spinal and Diaphragmatic Paralysis without Bulbar Involvement

This condition should always be anticipated where there is extensive deltoid paralysis. The diagnosis can readily be made by clinical observation. Restlessness, rapid shallow respirations, increasing cyanosis and distress, and decreasing diaphragmatic movement of the epigastrium will be seen early, while diminishing ability to count during a single breath, collapse of the lung bases, and a rising pulse rate and blood pressure are evidence of a severe degree of respiratory embarrassment and hypercapnia. Other aids to diagnosis, such as measuring the vital capacity, tidal air, or the carbon-dioxide content of alveolar air and venous blood, only confirm the clinical findings and are not practicable everywhere. It is usually found that severe paralysis of the limbs and trunk accompanies the diaphragmatic involvement, making the prognosis more grave.

The various types of tank or box respirators are adequate for maintaining these patients, and new modifications are constantly being produced. Small machines called "respiettes" are available for babies, and, when the patient is taken out for certain nursing procedures, Oxford inhalers and inflators may be used to maintain positive-pressure respiration for short periods. cuirass respirators are only of use for transport or for weaning patients from tank respirators. Rocking-beds are simply a temporary relief from one of the other types.

Combined Bulbar and Diaphragmatic Paralysis

It is not possible with the tank respirators at present available to get sufficient angulation to permit adequate postural drainage in the prone position and yet maintain respiration by negative pressure in the tank. Consequently the only alternative is to use positive pressure through a cuffed tube inserted into a tracheotomy opening, as this seals off the pharynx and prevents secretions being inhaled. A variety of machines has been produced to deal with this emergency. They may be operated electrically or by compressed air or gas, and many of them appear to be very successful. However, few reports have appeared in the British literature of this form of positive-pressure respiration and the results have not been very encouraging. The method was used extensively by the Danes in 1952; during a devastating epidemic in which 316 cases of respiratory failure were dealt with, 250 by positive pressure, an initial mortality of 85% was reduced to 40% by the end of the

epidemic. No clear details of the final condition of the survivors has so far been published to permit an estimate of the gain from the increased saving of life.

Prognosis with Severe Paralysis

Some idea of the outcome of the more severe forms of paralysis may be obtained from the following figures of cases nursed at Walker Gate Hospital during the years 1946 to 1955 inclusive. There were 304 cases of paralytic disease of which 65 had some type of respiratory involvement and 37 died.

Bulbar Paralysis (19 cases; 4 deaths).—Of those dying, one succumbed with anoxia due to pooling of mucus, in one day; one collapsed after a throat aspiration; one died in four days and probably had some diaphragmatic weakness also; one died in five hours with myocarditis and encephalitis. Twelve patients made a complete recovery, two are disabled but are able to get about, and one has some weakness of one shoulder.

Diaphragmatic Paralysis (25 cases; 14 deaths).—Those who died also had extensive spinal paralysis, either paraplegia or quadriplegia. Three, one of whom had had an operation for ileus, died in the respirator on the first day. Five died still requiring assisted respiration, two of ileus a year later, one of convulsions nine months after the onset, one owing to failure of the machine, and one of enterocolitis within two months. Two died of sudden massive collapse of the lungs and four of pneumonia several months later, while not having aided respiration. Of the survivors, one is still a respirator-cripple, five have severe paralysis and are complete cripples, and five have mild or moderate residual disability.

Bulbar and Diaphragmatic Paralysis (15 cases; 13 deaths).—All but one of these cases occurred before the introduction of positive-pressure methods; the exception had an endotracheal tube passed while in the respirator with relief of anoxia, but died later. Of those who died, nine were extensively paralysed, but three had only mild or moderate paralysis and might conceivably have benefited from positive pressure. The two who recovered would probably have done so without mechanical respiration, as the diaphragm was not completely paralysed.

Cases of Respiratory Failure Not Nursed in Respirators (6 cases; all died).—One was a baby of nine days who collapsed suddenly, the others were young children and difficult to assess. One collapsed without paralysis, one had diaphragmatic weakness and encephalitis, one had diaphragmatic involvement and extensive spinal paralysis, one had only bulbar paralysis, and the last survived some months but was severely paralysed and died from pneumonia months later. The difficulty of differentiating encephalitis from anoxia and carbon-dioxide retention was well illustrated in four of these cases, and probably they would have been helped by the respirator or other treatment now available.

This survey makes lamentable reading, but it does indicate what may be expected from the various treatments in severe poliomyelitis. Apart from the cases of uncomplicated bulbar paralysis, where the prognosis is good, the others were also badly paralysed elsewhere, and even when they survived the respiratory difficulties they were liable to succumb to infection later or to remain permanently crippled. Of the survivors from respiratory failure—13 out of 46 patients—only seven have now a tolerable existence. To this must be added the mental anguish and despair of the doomed victims, together with the often prolonged strain on the parents, relatives, nurses, and doctors, in order to get a clear view of what a mixed blessing the mechanical respirator has proved to be.

Though only a proportion of those infected with poliomyelitis are paralysed, this review exposes the serious limitation of treatment for the patient with extensive limb or respiratory paralysis. It lends further support, if this were necessary, to the need for effective prevention.