TREATMENT IN GENERAL PRACTICE

This article is one of a series on the management of some lesions of the nervous system met with in general practice

TREATMENT OF ACUTE POLIOMYELITIS

BY

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The treatment of poliomyelitis has to be considered under three distinct aspects. These are: (1) the adoption of measures intended to cut short the infection before the nerve cells have sustained irreparable damage; (2) the adoption of measures intended to limit the spread of infection to other susceptible persons; and (3) the care and treatment of the paralysis which is the characteristic result of the disease. It may be said at the outset that there is no general consensus of opinion as to what can and may most usefully be done in respect of any of these three therapeutic problems, but the following brief statement is believed to embody the conclusions of those who have most closely studied them at first hand.

Serum Therapy

If we are adequately to assess our resources in controlling the infection before paralysis ensues, or in minimizing the severity and extent of the paralysis, we must consider very summarily what is known of the nature of acute poliomyelitis. Until recently it has been generally believed that poliomyelitis begins as a general infection represented clinically by a brief febrile illness of no unequivocal pathognomonic features, followed by an invasion of the subarachnoid space and then of the nervous tissues by the virus. Further, it has long been known that the serum of persons who have recovered from an attack of poliomyelitis possesses properties that protect such a susceptible animal as the monkey when some of this serum and infective material are *simultaneously* inoculated into the animal, or when the serum is administered within twenty-four hours of the experimentally produced infection. On the other hand, the administration of protective or, as it is commonly called, "convalescent serum" to a previously infected monkey after the symptoms of the disease have appeared is of no value, and the disease runs its normal course undiminished in severity.

This observation should have served to warn us that no very striking therapeutic results in man could be expected from the employment of convalescent serum, since from the very nature of the situation its use is delayed until the disease has developed and been recognized. Nevertheless, for over twenty years convalescent serum has been given in the hope, or by some in the belief, that by its means the infection might be destroyed before the virus reached the nervous system; or, alternatively, that it might serve to check the effects of the virus after it had gained entry into the nervous tissues and thus to mitigate the extent and severity of the paralysis. During this period clinical opinion has varied between extreme optimism and complete scepticism as to the value of convalescent serum; but the present position is that in the United States, where experience of its use has been most extensive and most closely controlled, the weight of opinion is that the serum treatment of poliomyelitis has not proved its value, and that the best that can be said of it is that it does no harm.

More recent investigations appear to throw some light upon this disappointing result, for it now seems that from the outset poliomyelitis is an exclusively nervous infection, that the initial pre-paralytic stage of the disease is in fact a reaction of the nervous system to invasion by the virus, which has already reached the motor nerve cells before any symptoms appear. The now widely admitted inefficacy of serum treatment may therefore find its explanation in the light of this conception of the disease. The damage is done before treatment can be given. Nevertheless, considerations of expediency, or the desire to protect potentially susceptible contacts from infection, may from time to time appear to call for the employment of convalescent serum. In these circumstances the procedure is as follows.

How to Give Serum

Human convalescent serum is prepared at the serum department of the Lister Institute, and may be obtained on application from the Medical Superintendent of the Western Hospital, Seagrave Road, Fulham, S.W.6. It is issued in 25 c.cm. ampoules, with full instructions for administration. The usual practice is to give 25 c.cm. intrathecally after withdrawing about 30 c.cm. of cerebro-spinal fluid by lumbar puncture, and another 25 c.cm. intravenously or intramuscularly. As the supply is limited, its use is intended only during the pre-paralytic stage or in cases showing spreading paralysis. It is probably only during the course of an outbreak of poliomyelitis that a provisional diagnosis of the disease is likely to be made before paralysis develops, and in these circumstances the cerebro-spinal fluid should be examined immediately and before serum is injected. The characteristic changes to be observed in poliomyelitis are as follows: an increase in cells up to 1,000 per c.mm., the cells being mainly mononuclears; in a few cases there may be many polymorphonuclear cells (50 per cent.). There is a moderate protein increase. The glucose and chloride contents remain normal. No other measures have any known value in controlling the infection, and the use of hexamine has proved unavailing for this purpose.

The diagnostic lumbar puncture with withdrawal of fluid may have some effect in relieving the pain and restlessness of the febrile stage of the illness, but repeated lumbar puncture for this purpose is not indicated.

Prophylactic Measures

The nasopharyngeal secretions, and probably the faeces, are thought to be infective during the incubation period (probably twelve days) and also during the first ten days of the developed illness. Therefore the nursing of the patient during this time must be planned on this understanding—that is, the patient must have his own utensils; material used as handkerchiefs must be burned and excretions disinfected. The value of antiseptic gargles for the patient and other members of the household is uncertain and probably not great, but it is expedient to employ them in order to impress upon all concerned the infective nature of the malady under treatment. Since the susceptibility to the disease is maximal during the early years of life, other children are best removed from the focus of infection where practicable.

Onset of the Disease

During the initial febrile phase of the illness, which may last for from a few hours to three or four days, diagnosis is rarely possible, and the measures taken are those appropriate for any febrile illness in a child. They include absolute rest in bed, the administration of castor oil or other aperient according to the patient's age, and a fluid diet; for the relief of the pain that may develop in head, back, or limbs, aspirin in 5-grain doses, repeated three times daily, will usually suffice.

The paralysis is generally sudden in appearance and is maximal at the onset, tending to diminish progressively in extent and severity after the acute stage is passed. Occasionally, however, particularly in older patients and during an epidemic of the disease, the paralysis may appear in the lower limbs and spread upwards during the course of a few days. It is in such cases that death ensues from paralysis of the respiratory muscles. Again, in a few cases the paralysis may spread by a series of "jumps," appearing first in one limb and later in others. As a rule, however, the parents of the child may be assured that further spread after the first appearance of paralysis is unlikely.

From the onset of paralysis it is usual to divide the clinical course of the illness into acute and convalescent stages, the former lasting until muscular pain and tenderness have disappeared (two to six weeks), and the latter until the slow process of recovery has ceased—that is, from two to three years.

Treatment in Acute Stage

During the acute stage treatment should be confined to the relief of pain, restlessness, or sleeplessness, and to the keeping of the paralysed parts in a position of physiological rest. No other measures should be undertaken. Pain and tenderness are as a rule most severe in muscles which are but partly paralysed, and are most extensive in those patients in whom there is widespread muscular weakness—perhaps without any profound paralysis of any muscle. Aspirin in 5-grain or 10-grain doses, according to age, usually gives adequate relief, but bromide and chloral (dose according to age) may be necessary at night to secure sleep.

As soon as the presence of paralysis is detected—and it is at this point in most cases that diagnosis is first practicable—it is important to discover its extent and severity, even though this may require a painful examination. The rapidity and completeness of recovery in those muscles not irrevocably paralysed depends largely upon their being placed without delay in the position of rest—that is, of shortening. It may happen, for example, that paralysis of a deltoid may escape notice for some time, and that for a week or more the affected arm may be allowed to lie adducted to the side, the deltoid being thus permanently stretched for this period and its power of recovery impaired. Again, adhesions in joints which will later demand painful and difficult mobilization may occur if an early examination has not revealed paralysis of muscles acting upon it.

The paralysed legs should be kept extended, adducted, and rotated in, and the child nursed in the supine position with a small pillow beneath the knees to prevent over-extension at these joints. The feet must be kept at right angles to the legs. To secure all this sandbags and light splints may be needed. For small children splints should be as light and comfortable as possible, and with a little ingenuity adequate splints may be made from cardboard, cotton-wool, and adhesive strapping. Deltoid paralysis requires abduction of the arm, either by a splint or by fixing the arm to the head of the bed by means of a looped towel. During the acute stage no

massage should be given, but periodical, gentle, and limited passive movements are all that are required or justified. If the back muscles be affected, the child must be kept strictly supine and straight in the bed, and not allowed to sit up or be propped up until an adequate spinal support has been applied. It is in cases of severe weakness of the back that the most prolonged rest in bed is needed.

Management During Convalescence

Once the convalescent stage is reached more active measures are called for. Within the compass of this article only the general principles of treatment can be stated. The measures to be adopted may be enumerated in the order of their importance. They are active exercises, passive movements, massage, orthopaedic measures. Electrical treatment is not given in this list, for extensive and controlled observations have shown that its use does not avert muscular wasting or hasten recovery. Indeed, when electrical treatment is regarded as the main line of attack it is positively harmful, in that it leads to neglect of more rational measures. This is a doctrine almost as unwelcome to the profession as to the public, so strong is the force of tradition, but it represents the weight of informed opinion. Indeed, it is impossible to see by what means the electrical stimulation of muscles can be expected to be of value. It can have no influence upon the recovery process in the spinal cord, and if the muscles are receiving exercises and massage, electrical treatment is at best quite superfluous.

Active exercises for those muscles which retain, or regain, the power of active contraction are the most valuable measure available. When the muscles are too feeble to carry the weight of the limb, this must be borne by the masseur, and active contraction is carried out over a limited range and against a minimum of resistance (assisted exercises). For every patient a scheme of such exercises must be drawn up and followed according to the distribution and degree of weakness, and the scheme must be modified from time to time as recovery proceeds. For totally paralysed muscles such exercises are not possible, and it is for these that massage and passive movements provide the next best mode of treatment. They have no actively curative effect, but they help to preserve the muscular tissue until innervation is restored. It cannot be too strongly emphasized that massage is not a substitute for active exercises in such muscles as can be dealt with in this way.

As soon as possible the patient must be mobilized. This may require splints for the legs and mechanical support for the back. It is important that such support should be provided before the back or legs are called upon to carry weight, and it is at this stage that the orthopaedic surgeon may be looked to for advice. In patients in whom severe paralysis and wasting remain after all possible recovery has taken place the feet and legs may become oedematous and cyanosed and the seat of painful and troublesome chilblains. For such cases lumbar sympathectomy is sometimes a valuable palliative measure.

The Drinker Respirator

A word may be said as to the use of the Drinker respirator. With an ascending paralysis the patient is threatened with paralysis of the respiratory muscles. Placing him in this machine may tide him over the climax of the paralysis and thus keep him alive until the upper level of paralysis recedes in a few days and respiratory movements again become adequate. It is clear that the number of patients of whom this is true is extremely small, and it has happened that after several days in the respirator it has become clear that no recovery is

taking place and that life is possible only in the machine. It cannot be indefinitely prolonged in this way, and both patient and doctor may be placed in a tragic situation in having to decide for how many days this dreadful existence is to be prolonged. Again, a life may be saved only to leave a profoundly paralysed and permanently helpless and bed-ridden patient. A truly successful result—that is, one in which useful restoration of muscular power ensues after a period in the respirator—must be rare indeed. The Drinker respirator, therefore, is not a therapeutic instrument of striking possibilities in the treatment of poliomyelitis, whatever may be its value in other varieties of respiratory difficulty.

INSANITY AND CRIMINAL RESPONSIBILITY

DISCUSSION IN KINGSTON DIVISION

At a meeting of the Kingston-on-Thames Division of the British Medical Association at Kingston Hospital on October 8th there was a discussion on "Insanity as a Defence in Criminal Cases." The chair was taken by Judge Dobson of the Central Criminal Court, and the legal and medical points of view were maintained respectively by Mr. G. B. McCLEURE, Junior Counsel to the Treasury, and Dr. DORIS ODLUM. There was an attendance of more than fifty.

The Legal Argument

Mr. G. B. McCLEURE argued that the existing legal definition of insanity for the purpose of defence on a criminal charge was correct and sufficient, even though it dated back to 1843. It was framed in the shape of answers by the judges engaged in criminal jurisdiction at the time to five questions put to them by the House of Lords; the issue arose out of the case of M'Naghten, who, in what was alleged to be madness, had fatally shot Mr. Drummond, the secretary of Sir Robert Peel.* One thing that never had been disputed was that the onus of showing that a person was not responsible in law, because of insanity, for an act which was alleged as a crime was upon the defendant. In the M'Naghten rules there was no reference to what had come to be called uncontrollable impulse, but there had been cases in which the question had been raised (for example, *R. v. True*, 1922) whether such a condition constituted an excuse. It was held in one case that it might be a defence if there was a defect of reason due to a disease of the mind such as to make a person, although he knew he was doing wrong, unable to control his impulses; but it was well to be reminded of the words of old Sir Matthew Hale that it might lead to "great indulgence being given to great crimes." At any rate, the Court of Criminal Appeal had made it known quite recently that it had no power to vary the M'Naghten rules to admit of any such qualification. Some time ago there was considerable discussion on the subject in South Africa, and the Chief Justice of the Cape of Good Hope laid down the principle that where the defence of insanity was interposed in a criminal trial the capacity to distinguish between right and wrong was not the sole test of responsibility in all cases. In the absence of any law to the contrary, said the Chief Justice, there must be some recognition of a mental disease which might prevent a person from controlling his impulses, and the defence of insanity was established if it were proved that the accused had, by reason of such mental disease, lost the power of will to control his conduct in reference to the particular act charged as an offence, but the capacity of the accused to control his own conduct must be presumed until the contrary was proved. It was significant, however, that the M'Naghten rules had never been extended to admit of uncontrollable impulse, and he thought the rules were adequate to present needs. It was singular that the defence of insanity was only

raised in murder cases, while in cases of suicide a verdict of "insane" was returned almost as a matter of course, although no one probably really believed that in the legal sense the suicide was insane.

The Medical Point of View

Dr. DORIS ODLUM said that the conception of the functions of the mind no longer consisted only of will, knowledge, and reason, but had come to include emotion. Therefore the old legal position based on the M'Naghten rules, depending as it did almost entirely on that older view of the functions of the mind, was in the light of modern views inadequate, to say the least. It might well be said that a person committing a crime was capable of knowing the nature and quality of the act, was aware with his reason that it was wrong in the social and moral sense, and yet the emotional disturbance which was at the basis of his illness so discoloured his mental processes that for him the act ceased to be wrong, and was in fact the only possible course of action he could take. There were many cases in law in which, if a stand were taken on the M'Naghten rules, a man could not be proved insane, although, on the modern conception of the emotional urge, a very different view might be taken. The "irresistible impulse" was something emotionally conditioned. It might not be obvious that the reason or the will of a person labouring under such an impulse was defective; but to those who understood this particular branch of medicine it would be plain that the whole emotional trend of that person's character had led him to a position in which the act he had committed was absolutely inevitable for him. It had been led up to by a process of causes and effects of which the act itself was only the culmination. The present law did not take account of this essential factor. Members of the legal profession sometimes appeared to think that in asking for something wider and more in harmony with modern conceptions of the mental state than the M'Naghten rules the medical profession was desirous of whitewashing criminals and explaining away responsibility. This was not so at all; but a doctor realized that punishment in the legal sense—that is, by imprisonment—was not always the best way of dealing with a person who had committed a crime: it was not the best way in the interests of society apart from the interests of the person convicted. The mentally deranged criminal was potentially a greater danger to the community than the sane criminal, whose motives were gain or revenge, and it was less likely in the mental case that imprisonment or other social sanction would have any effect. The medical profession did not want the person who had committed the crime to escape the consequences of his act, but imprisonment was not going to cure delusions: it would only give the insane person a greater grudge against society, so that, unless indeed he was imprisoned for life, there was likely to be sooner or later a repetition of his offence. She suggested that psychiatrists should be attached to the courts; this would assist the legal profession in dealing with cases in which insanity was pleaded, and would secure a more just disposal of those in which insanity was proved.

General Discussion

In some general discussion Dr. W. RUSSELL BRAIN said that the criterion of defective reason as an indication of insanity had been shown by modern psychology to be unsatisfactory. Many patients whose minds were disordered suffered from disturbances in the realm primarily of emotion, not of intelligence. As doctors they were not primarily concerned to define insanity—a thing which had never been successfully done—nor strictly with the question of how far these persons were responsible for their actions: that was a psychological or legal question, not a medical one. But he felt it should be possible to give some such verdict as "Guilty, but the act was committed as a result of disorder of the mind," which would not tie anyone down to a definition of insanity; and instead of "detained during His Majesty's pleasure" it should be possible to bind such persons over on the understanding that they entered suitable institutions for

* The M'Naghten rules, which have been accepted as laying down the law of England on the definition of insanity with reference to criminal responsibility, will be found fully set out with a list of references in Archbold's *Criminal Pleading*, 1934, pp. 14-17.