

The Modern Treatment of Poliomyelitis, Based on a Recent Visit to Europe*

BY

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Acute poliomyelitis, better known as infantile paralysis a generation ago, is not a new disease. It was known to the ancient Egyptians and is depicted in the murals they have left behind. A more or less recent development in this disease is that it frequently attacks the adult, and the incidence in the adolescent and young adult is fraught with great danger since so many of them exhibit the serious paralytic types. A reason for this difference may be excessive muscular fatigue between the primary and secondary illnesses.

There are various degrees and various forms of the malady, according to the severity of the infection and to the part of the central nervous system attacked by the virus.

Since we have obtained in recent years new drugs, both chemical and antibiotic, which have the power to overcome many, if not most, of the known organisms of disease, it has been very noticeable that accompanying these organisms (as younger brothers, so to speak) and often involved in the diseases effected by them are many viruses, some known, some unknown and many just guessed at. For example, a pneumonia and an influenza were recognised simply as such and certain known organisms were associated with these diseases. Now it is a commonplace to speak of a particular type of pneumonia or influenza, such as a "virus pneumonia" or a "viral influenza," etc.

Poliomyelitis, however, is recognised as mainly a virus disease, and already three strains of this virus are known and recognisable. No. I, Brunhilde; No. II, Lansing; and No. III, Leon—all of them capable of killing and crippling the victim—in epidemics, more particularly the first. No. I.

After the outbreak we had in Southern Rhodesia in 1954-55 it was realised by the Medical Officer of Health, Salisbury, that since Salisbury was being used as a focal point or centre for the reception, care and treatment of polio vic-

tims from the surrounding country and even from Nyasaland and Northern Rhodesia, the time had come to overhaul our facilities, our methods of treatment and our equipment in order to be prepared in future to deal with fresh outbreaks and particularly in regard to the life-endangering types of poliomyelitis.

The State Lottery Trustees were approached and readily agreed to finance a study tour of European hospitals, and as a result I was given the opportunity to do so by the M.O.H. and the City Council of Salisbury.

It has been abundantly proved in Europe and the U.S.A. that given certain treatment and the use of certain equipment, many lives have been saved. Great advances cannot be claimed in the prevention of paralysis in the acute phase of the disease once this is established, but the orthopaedic surgeons and physiotherapists can definitely claim striking advances in the treatment of paralysis and loss of function in the later convalescent phases, and the physiotherapists also share in the advances of treatment in the acute febrile stage by maintaining proper aeration of the lungs where there is paralysis or threatened blockage of respiration.

There are roughly five different types or degrees of poliomyelitis infection:—

- (1) *The Non-Paralytic Type*, including the temporary weakness of limbs, and also a meningo-encephalitis type, neither of which progresses further.
- (2) *The Spinal Paralytic Type*, with paralysis limited to limb or limbs.
- (3) *The Spinal Paralytic Type*, with involvement of the muscles of respiration with or without involvement of limbs. This patient is threatened with asphyxia.
- (4) *The Bulbar Paralytic Type*. Here the virus has gone further up the CNS and involved the brain stem. This may only involve some of the cranial nerves, but the great danger here is involvement by the direct route, of the ninth and tenth nerves, with paralysis of the muscles of speech and swallowing and with an excessive flow of oral and pharyngeal secretion and the risk of aspiration of the secretions into the lungs—a life-threatening condition.
- (5) *The Bulbo-Spinal Paralytic Type*. If this involves the muscles of respiration and the muscles of swallowing, the patient's life is in extreme danger unless vigorous procedures are adopted at once.

* An address given to the Salisbury and District Branch of the Central African Association of Medical Laboratory Technologists at the Wilkins Infectious Diseases Hospital, Salisbury, on 21st November, 1956.

TREATMENT OF THESE TYPES AND DEGREES OF
POLIOMYELITIS INFECTION

(1) This condition requires ordinary nursing care, isolation at home or in hospital. Rest is the main feature of treatment.

(2) Paralysis of the limbs. This requires great care in handling, with hot packs, gentle movements and rest.

(3) This requires treatment in a tank respirator, so long as the case remains dry and adequate ventilation of the lungs is obtained.

(4) Here postural drainage may relieve the symptoms. If not, tracheotomy operation with a cuffed tracheotomy tube, with or without interrupted positive/negative pressure respiration to secure adequate ventilation of the lungs, is the required treatment.

(5) Here a tracheotomy as above and without delay is the only hope of securing adequate pulmonary ventilation and of preventing aspiration of fluids into the lungs.

This briefly is the over-all picture of what would require to be dealt with if it is accepted that Salisbury is to be recognised as a respiratory centre for the Federation, and it would be in line with the accepted set-up in institutions in Europe.

I visited the large Royal National Orthopaedic Hospital at Stanmore, where Dr. Kinnier Wilson, a research worker for the British Medical Council, has a laboratory and was testing all the known aids to artificial respiration and estimating what is required for adequate ventilation of the lungs. The work done in polio centres in and around London was studied, particularly the facilities available for investigating the chemical analysis and tension of the blood gases, the serum electrolyte balance, electrophoresis, the CO₂ combining power and so forth. Many of these laboratory findings give warning of adverse changes before they could be diagnosed clinically.

The work being done at the Radcliffe Hospital in Oxford (Dr. Ritchie Russell and Dr. Spalding), and at the Wingfield Hospital, Cowley (Prof. Trueta, the Nuffield Professor of Orthopaedics), was of similar stimulating interest.

There followed visits to the Monsall Hospital, Manchester, where they had an epidemic of

poliomyelitis, and to Ruchill Hospital, Glasgow (Dr. Tom Anderson), where the best set-up so far was seen, with special wards and laboratories, including a virological section, all complete in the same grounds. Dr. Anderson accepts cases from half of Scotland, south-west and west, including the Western Islands, and has at his disposal specially equipped ambulances and air services.

Aberdeen is apparently singularly free of polio, but in Copenhagen I had the benefit of hearing, at first hand, Professor Lassen's experience in the 1952 outbreak when 3,000 cases were handled, most of which were dependent on positive pressure, with or without tracheotomies, mainly hand-operated by teams of students and indeed by anyone he could press into this service. Professor Lassen still has cases from the 1952 epidemic, dependent on artificial respiration, but quite happy in spite of their infirmities.

The tour concluded with a visit to Zurich, where an inspection was made of the marvellous Kanton Hospital and Professor Rossier's Universitatsspoliklinik, with its self-contained laboratories within the section of the hospital under his control.

Finally, in addition to the valuable equipment already in our possession, I must stress the need for humidifiers (especially in view of our climate and altitude), positive/negative respiratory pumps, light portable equipment to go out with ambulance or aeroplane, and an anaesthetist and specially trained nurse to travel back to the hospital with the patient, who may require artificial respiration on the journey if his life is not to be endangered.

Adequate laboratory facilities and an organised team consisting of trained nursing staff, anaesthetists, physician, biochemist, physiotherapist, otolaryngeal surgeon and orthopaedic surgeon, all to be on call at short notice, are essential.

If the required organisation is set up by the municipalities and the Government and cases can be safely canalised into a respiratory centre situated perhaps in Salisbury or Bulawayo, lives can be saved which in the past were imperilled by the hazards of a journey, when already respiratory embarrassment was advanced beyond the limits of safety or was hastened by and developed during the journey itself.