SOME ASPECTS OF THE LANDRY-GUILLAIN-BARRE-STROHL NEUROPATHY

E. A. CACHIA
M.B., CH.B. (MANCH.), D.C.H. (LOND.)

LUIS VASSALLO
B.Sc., M.D., M.R.C.P. (LOND.), M.R.C.P. (EDIN.), M.R.C.P. (GLASG.)

H. M. LENICKER
M.D., D.C.H. (LOND.)
St. Luke's Hospital

The condition of acute polyneuropathy has intrigued clinicians especially since the demonstration by Guillain, Barré and Strohl in 1916 of the unusual discrepancy between the high protein content of the cerebrospinal fluid and the normal cellular count. The course of the illness can be fulminating and the differential diagnosis may be difficult. An illustrative case is described here and certain aspects of the disease are discussed with special reference to the difficulties in differential diagnosis.

Case report

A three year old boy had been apparently healthy till he complained, two days before admission, of pain in the calves which he claimed was relieved if he stood on his toes. He was afebrile. There was no history of recent upper respiratory tract infection nor of any rashes. He had not been given any drugs by mouth or by injection and no recent immunisation procedures had been carried out He had been fully immunised against diphtheria, tetanus, whooping cough, smallpox and poliomyelitis. On the morning following the onset of the pain he was noted to be irritable but soon after slept for most of the morning. When he woke up his mother noted him to be unsteady on his legs. Later he was only able to crawl and a few hours afterwards he was unable to bear his head upright. Weakness of the upper limbs was the next feature. During the following night he had abdominal pain and several bouts of diarrhoea. He was admitted to hospital the next morning.

On admission (25. 4. 68) he looked drowsy and his voice was weak. Saliva dribbled from his mouth. There was no neck rigidity but there was a marked head drop sign. The pupils were of normal size and reacted normally to light. The fundi were normal. There was paresis of the right facial nerve, dysarthria, dysphagia and weakness of both sternomastoids and trapezii. He was unable to sit up. Respiration was not affected. In the limbs no wasting was present. There was symmetrical paralysis of both upper and lower limbs and only slight voluntary movements of the fingers and toes remained. The deep tendon reflexes were universally absent and the superficial reflexes could not be elicited. There was marked tenderness of the glutei, hamstrings and gastrocnemii. Passive movements of the lower limbs were resented by the patient. The plantar reflex was flexor on the right side but there was no response on the left. As far as could be ascertained no obvious impairment of the sensory modalities could be demonstrated. During the course of the day he became incontinent of urine and faeces.

Investigations showed a Hb level of 79% and a white cell count of 7500/cmm with a normal differential count. His sedimentation rate was 14mm in the first hour. Antistreptolysin-O titre was 50 Todd units/ml. Serum agglutination tests against *Brucella melitensis* and *Salmonella typhi* were negative. Urinalysis was normal and

no change in the colour of the urine was noted after it had been left to stand for some hours. Mantoux skin test was negative. Serum protein electrophoresis showed a reduction in albumen and gamma globulin and a significant increase in α^1 and α^2 suggesting an acute inflammatory process.

Lumbar puncture was performed on admission. The fluid was clear and colourless, it was not under increased pressure. The protein content was 20mg/100ml. The cell count was 1 lymphocyte/cmm. No microorganisms were cultivated.

A provisional diagnosis of acute polyneuritis was made. Because of the dysphagia he was fed by Ryle's tube. Antibiotic cover with Chloramphenicol and later with Penbritin was given. He was carefully watched during the next few days. As his condition appeared to be stationary on the 3. 5. 68 he was started on ACTH 40 IU daily. Four days later the dysphagia and dysarthria began to improve and the ACTH was slowly reduced in dose every few days so that by the 14. 5. 68 he was having 10 IU daily. The dose was reduced to 10 units on alternate days on the 17. 5. 68. ACTH was discontinued on the 26. 5. 68.

On the 12. 5. 68 motor power began to return in the upper limbs; improvement was more marked on the left. Movement returned in the legs a few days later. After a few weeks motor power in the upper and lower limbs had recovered almost completely though slight limping was still present on discharge from hospital.

A second lumbar puncture was performed on the 13. 5. 68. The fluid was still clear and colourless. The protein content had now risen to 250mg/100 ml. The cell count was 2 lymphocytes/cmm. CSF was also taken for electrophoresis but no significant pattern could be demonstrated.

Discussion

There are few conditions in medicine towards which there has been such controversy regarding eponyms and definition and so much endeavour to apply different labels. The commonly used eponym is that of the Guillain Barré syndrome. Though this is now firmly entrenched in medical textbooks, it is not quite correct as Strohl, the third author of the original paper is thus left out. Nowadays it is usual to regard the syndrome of ascending paralysis described about a century ago by Landry as being merely a clinical variety of this condition. Many workers group the many clinical varieties of the syndrome under the heading of the "Landry-Guillain-Barré-Strohl" class of neuropathy.

Prior to the demonstration by Guillain and his colleagues in 1916 of the characteristic cytoalbuminological dissociation, the term "acute febrile polyneuritis" was used by Osler in 1892. This term was unfortunately changed to "acute infective polyneuritis" in 1918 which is still very widely used today giving the mistaken impression of marked infectivity and need for clinical isolation of these patients. Bradford, Bashford and Wilson coined this name on the erroneous claim that they could transfer the condition from patients to monkeys.

Up to almost two decades ago it was still authoritatively believed that the cause was most probably infective. However, the most commonly held modern view is that the polyneuropathy is of an allergic nature. This view is based in part on clinical experience as many cases give a past history of infection which may vary from an obscure gastrointestinal or upper respiratory tract illness to mumps, measles or infectious mononucleosis. This militates against a single infective etiology as does the fact that the syndrome has been seen in cases of systemic lupus erythematosus and thrombocytopenic purpura.

Histological appearances of the affected nerves also support the allergic hypothesis as does the experimental evidence in animals injected with an emulsion of homologous nerve tissue along with Freund's adjuvant (Waksman and Adams, 1955). The severe demyelination of the nerve roots in the region of the dorsal ganglion with lesser axonal involvement resembles very closely the pathological changes seen in patients' tissues.

One feature that is worth stressing here is the frequent late appearance in the

course of the disease of the protein rise characteristically often seen in this condition. Repeated lumbar punctures may be necessary to demonstrate this. In our case the CSF protein content on the 25. 4. 68 was 20mg/100ml. Nineteen days later the protein content had risen to 250mg/100ml. This protein rise after the first week of the illness has also been mentioned by others. (Low, Schneider and Carter, 1958). The increase in protein may continue for the first four to five weeks. There is apparently no correlation between the degree of protein rise and the severity of the clinical condition.

Another point worth mentioning is the good prognosis in this self-limiting condition even in the presence of respiratory and bulbar muscle paralysis, provided that these complications are adequately treated. Reviews on the subject give a mortality up to 7% only (Aylett, 1954).

In the differential diagnosis the possibility of biological and exogenous toxins must be considered. Of the biological toxins the diphtheritic one is the most important. The characteristic palatal and ciliary paralysis should help in the differentiation. Of the exogenous toxins, heavy metal poisons, especially lead, should be borne in mind. With the widespread use of insecticides these must also be excluded. There have been reports in the literature where exposure to DDT, Aldrin and Endrin have been associated with polyneuropathy showing albuminocytological dissociation in the CSF.

An initial mistaken clinical diagnosis that may very easily be made is that of poliomyelitis. Some early clinical features namely muscle pains and weakness followed by bulbar paralysis are common to the two conditions. The differential diagnosis may be very difficult for a doctor to make outside hospital. However, the lack of an increased CSF cell count, the demonstration in the older child of sensory loss and the symmetrical paralysis are important diagnostic clues. Another condition which closely resembles this polyneuritis is acute cerebellar ataxia in children. This is held by some to be merely a variant of the same condition and the main differential point is the presence of ataxia in the absence of gross weakness. Porphyria is another condition that should always be considered. Here the family history and the presence of porphyrins in the urine may be of help.

In a small proportion of cases papilloedema has occurred in this syndrome and then the differential diagnosis from a cerebral space occupying lesion may be difficult.

The place of steroids in the treatment of acute polyneuritis is still debateable. Guillain in 1953 rejected steroids with the words: "It seems to me that the habitually favourable progress of the Guillain Barre syndrome does not justify these injurious medications."

The first report on the use of steroids in this syndrome were also unfavourable (Shy and Mc Eachern, 1951). Clark and his colleagues, (1954) however, found them beneficial. These workers were the first to use these drugs in this condition in the United Kingdom. The experience of later workers has on the whole been favourable. Thus Heller and De Jong in their review of the treatment of the Guillain Barré syndrome concluded that the use of corticosteroids was probably justified. Watters and Barlow (1967) feel that the use of steroids should only be witheld if improvement is already occurring, if an active infectious process is present, or if CSF pleocytosis has been found.

Treatment with ACTH was started in our patient as no clinical improvement had occurred and dysphagia was complete. Though improvement was noted within three days of starting treatment, one's conclusions can only be tentative.

It had also been hoped in this case that it would be interesting to show any difference between the phoretograms of serum and CSF, as any striking differences in protein concentration might have helped to throw light on the nature of the inflammatory process present. This was not successful but it is felt that more vigorous attempts should be made in such cases.

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