Current Practice

CHILD CARE IN GENERAL PRACTICE

Cerebral Palsy—Part II

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In Part I of this article (published in the *B.M.J.* last week) the aetiology of the various types of cerebral palsy was discussed and the importance of early diagnosis was stressed. This article is concerned with the management of the disorder and with its prognosis.

Management

Assessment

The full assessment of children with cerebral palsy is best carried out by a team comprising a neurologist or paediatrician, orthopaedic surgeon or expert in physical medicine, and a psychologist who have seen many patients suffering from the condition. There are many such teams working in children's hospitals throughout the country and in clinics set up by the Spastics Society[1] in England and Wales and by the Scottish Council for the Care of Spastics[2] elsewhere. These assessment teams are usually supported by social workers and by occupational therapists, physiotherapists, and speech therapists, who can be called on to help the parents and the child directly when the medical assessment is complete.

There are two main aspects of management. The first is the treatment of the child with a chronic handicap; the second is the direct treatment of his cerebral palsy and its complications. The first aspect is the more important.

Treatment of the Chronic Handicap

From the start every effort must be made to help the child to minimize the effects of his handicap and live the most normal life possible for him. Babies who cannot move must be moved by their parents so that they can learn what movement feels like. Those that cannot reach must have objects brought into contact with them so that they can experience different textures, consistencies, and shapes. At a later stage it is important that the greatest independence in locomotion, dressing, toileting, and self-care should be encouraged.

These aims can be achieved only if those who live with the child have come to accept the reality of his chronic handicap. Parents must be helped to come to terms with their feelings of grief and guilt about having an abnormal child. They must be helped to work out their feelings of bitterness towards each other, the medical profession, and God who has allowed this disaster to afflict their child. They must be encouraged to see that there is no magic cure by drugs, operation, chiropraxis, or faith-healing to be expected. Only when parents have reached the stage of accepting emotionally as well as intellectually the reality of the situation is the child likely to be encouraged in a positive way to make the most of his abilities, rather than to be over-protected or rejected.

General practitioners, therapists, and school-teachers can help greatly in maintaining the impetus of the drive towards maximum independence in the child's school years, but the constant care must lie with the parents.

It always has to be remembered that caring for very severely handicapped patients in this way imposes great physical and emotional strain on parents when long-term hospitalization is impossible. Placing such children in day nurseries or play centres for a few hours every day or even once or twice a week can greatly ease this strain. Admission of the child to a home or hospital for a few weeks can give much-needed relief to parents who may often be unaware of their own weariness and the emotional strain from which they suffer.

Treatment of the Disease Itself

The second aspect of treatment is the treatment of the child's cerebral palsy and his associated defects. Therapy has two main aims. The first is to help the child to overcome or circumvent his disabilities so that he may be as independent as possible—for example, a patient with severe dyskinesia may be shown how to position himself so as to diminish the amount of his involuntary movement, or exercises in the kneeling position may be given to the child with diplegia to encourage his balance in the erect position.

The second aim is to prevent the occurrence of secondary complications such as contracture, foot deformities, or dislocation of the hip, and to treat associated disorders, such as epileptic seizures, strabismus, and hearing defects. Physiotherapists have a major responsibility in helping to prevent fixed contractures, both by showing and carrying out active and passive exercises and by demonstrating methods of handling to parents and guardians. For example, flexion contracture at the hips in diplegia may be controlled in many cases if the child can be taught to sleep in the prone position. If contractures do threaten, splinting, callipering, or surgical correction by muscle slides or transplants or tendon lengthening may be required.

Treatment of Associated Disorders

The associated disorders that may require treatment are numerous. A few examples may be given. Strabismus, most common in patients suffering from diplegia, may require orthoptic therapy or correction by operation. Epileptic seizures must be investigated fully and treated by appropriate anti-epileptic drugs and by hemispherectomy in a few patients with very severe fits. Though drug treatment of seizures is often unrewarding in patients suffering from cerebral palsy, primi-

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done hydantoinates and sulthiame certainly offer more than phenobarbitone in the majority of cases. All patients who suffer from cerebral palsy should have detailed tests of hearing and those with hearing impairment may require appropriately selected hearing-aids. Many patients have behaviour disorders and specific learning difficulties which may be greatly helped by psychiatric treatment or by remedial teaching. Many severely affected children, especially those who suffer from bilateral hemiplegia or tetraplegic diplegia, are prone to recurrent pneumonia and other infections and require appropriate antibiotic treatment for these. Prophylactic antibiotic therapy during the winter months may be helpful in such patients.

Prognosis

Recent studies have shown increasingly clearly that much more needs to be done to provide employment for school-leavers who suffer from cerebral palsy. In present conditions between a third and a half of patients may be expected to be employed either competitively with normal people or in jobs where some allowances are made for them, and between 10% and 20% may be suitable when they leave school for sheltered employment or training for this. The individual patient's chances of obtaining work will depend chiefly on the severity of his physical disabilities and his mental impairment. Patients with hemiplegic or paraplegic involvement are more likely to find work than those in whom all four limbs are involved, but associated disabilities such as epilepsy, speech defects, and the effects on patients' appearance will also influence their chances.

Experience in employing school-leavers suffering from cerebral palsy in sheltered conditions is still limited, but it is already apparent that more patients could be employed if training schemes and sheltered workshops with trained supervisory staff were available to them. Somewhat paradoxically the attention recently paid to the problems of school-leavers suffering from cerebral palsy has served to emphasize the importance of early diagnosis and sound management in early childhood. The patient best fitted for employment is the school-leaver who is realistic about the extent of his handicaps and is determined to achieve as much independence as possible. It is apparent that his attitude will be largely dependent on the way in which he has been treated since earliest childhood by his parents, brothers and sisters, therapists, doctors, and teachers. The family doctor often has a major role to play in helping the parents to realize the full implications of having a child with cerebral palsy and in showing them how best to help him help himself.

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TO-DAY'S DRUGS

Estimation of Haemoglobin

The measurement of the haemoglobin concentration of a blood sample is the most commonly performed test carried out in the haematology laboratory. When interpreted in conjunction with the appearance of the stained peripheral blood film it enables a firm haematological diagnosis to be made in the great majority of blood disorders.

Normal Haemoglobin Values

The range of normal haemoglobin values is as follows:

Men	13.5–18	g. per 100 ml.
Women	12.5–16.4	g. per 100 ml.

The haemoglobin concentration in the newborn (cord blood) varies from 13.6 to 19.6 g. per 100 ml. and these values decline during the next 2–3 months of life. Values as low as 9 g. per 100 ml. may be found at 2–3 months of age in apparently normal infants. Thereafter there is a slow rise in haemoglobin concentration over the next few years and adult levels are reached at puberty. It is probable that iron deficiency contributes to these lower haemoglobin levels in childhood. The haemoglobin concentration remains the same in both sexes until puberty, when that in the male shows a further rise.

Grammes or Per Cent.?

Old habits die hard and the practice of expressing haemoglobin concentration as percentage values is widespread. Fortunately a haemoglobin concentration of 14.6 g. per 100 ml. is accepted as being 100% haemoglobin throughout Great Britain as well as most parts of the globe. Nevertheless it is as well to be reminded that before the work of the Medical Research Council's Committee on the Estimation of Haemoglobin 13.8 g. per 100 ml. was termed 100% in this country, and that the methods associated with Sahli, Dale, and others have quite different percentage equivalents. Clearly there can be no confusion if haemoglobin concentration is expressed in terms of grammes per 100 ml. of blood.

Collection of the Blood Sample

Standing up after a period of recumbency will produce a rise in haemoglobin concentration; conversely, lying down will produce a fall. These changes are usually of the order of 0.7 g. per 100 ml. but under some circumstances may exceed 1.5 g. per 100 ml. Standing up produces a fall in plasma volume and hence some haemoconcentration. Similarly the stasis following application of a tourniquet to the arm for longer than 60 seconds results in concentration of all the formed elements in the blood. It is therefore important to obtain a blood sample under standard conditions without undue venous stasis, and failure to do this will produce variations in haemoglobin concentrations of up to 10%.

When the blood sample is obtained by skin prick the result is reliable only if a reasonably free flow of blood has been obtained. Undue pressure in securing drops of blood will cause dilution with tissue fluid and may produce completely erroneous results.

Thus the error introduced in the collection of the blood sample often exceeds the normal variation in the technique of estimation of haemoglobin concentration. Further day-to-day variation in haemoglobin concentration of up to 1 g. per 100 ml. are often of little clinical significance.