FACTORs AFFECTING THE INCIDENTe OF HIP DISLOCATION IN CEREBRAL PALSY

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We have studied the natural history of spontaneous dislocation of the hip in cerebral palsy, with particular reference to the pattern of neurological involvement. In patients with bilateral hemiplegia and severe involvement of the upper limbs the incidence of dislocation was very high (59%), while in those with diplegia and little involvement of the upper limbs, only 6.5% were affected. There was no evidence of dysplasia or instability of the hip in any of the patients with unilateral hemiplegia.

A strong correlation was found between the stability of the hip and the patients' ability to walk. These findings have a bearing on clinical surveillance and also on the indications for prophylactic surgery.

Spontaneous dislocation of the hip is one of the important complications of cerebral palsy, although its reported incidence has varied from 2.6% (Mathews, Jones and Sperling 1953) to 28% (Samelson et al. 1972). It is generally believed that, as in so many conditions, prevention is better than cure and for that reason a vigilant attitude is essential. However, in planning a surveillance programme for a particular child, or in contemplating prophylactic surgery, it would be helpful to know which patients are particularly at risk and how great that risk is.

This paper is an attempt to identify those factors which are associated with a high incidence of dislocation and in particular the relationship of dislocation to the overall pattern of neurological disturbance.

PATIENTS AND METHODS

One hundred and two patients with cerebral palsy from four different sources were contacted and reviewed. These sources were: a combined orthopaedic and paediatric clinic; a general orthopaedic clinic; the past in-patient list of the Prince of Wales Hospital, Cardiff; and a local Spastics Society school (Craig-Y-Parc).

Of the initial 102 patients, 75 attended for follow-up. In a further 10 cases the notes and radiographs were adequate to allow inclusion in the review, making a total of 85 patients. Their ages ranged from 6 to 28 years with an average age of 14.6 years.

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appeared entirely normal, but some with minor abnormalities were also included; thus, small degrees of uncovering of the head (less than one-third) and small degrees of apparent coxa valga not associated with any other abnormality were ignored. A break in Shenton's line as an isolated finding also was disregarded.

RESULTS

Of the 85 patients, 44 were found to be bilateral hemiplegics, 29 were diplegics and 12 were hemiplegics.

In the bilateral hemiplegic group, 26 patients (59%) had at least one hip which was classified as abnormal; of these, nine patients (20.5%) had hips which were dislocated, nine (20.5%) had subluxated hips and eight (18%) were dysplastic.

Of the 29 diplegics, only 2 had hips classified as abnormal; one patient had bilateral dislocations, while another was classified as dysplastic.

None of the hemiplegics had any abnormalities of the hip or even the minor radiographic signs previously described.

The relationship between the condition of the hips and the patient’s ability to take weight was also considered. Findings in the different neurological groups were as follows.

Bilateral hemiplegics. Of this severely affected group, only nine patients (20.5%) were able to walk unaided; all had hips which were classified as normal. There were another nine patients in this group, also with normal hips, who were nevertheless unable to walk at all.

Another eight patients (18%) could walk with the aid of a frame or rollator; of these, all had abnormal hips; two had dislocated hips, three had subluxated hips and three showed dysplasia.

The largest group of 18 patients (61%) were all non-walkers and all had abnormal hips; of these, 7 were dislocated, 7 were subluxated and 4 were dysplastic.

Diplegics. Of these 29, 19 (65.5%) were able to walk unaided, and all of these had normal hips. Seven (24.1%) walked with assistance and of these 5 had normal hips. One of these seven was a boy aged 10 with bilateral dislocations who could walk short distances with the aid of a rollator; another had one dysplastic hip but walked well with one stick. There were only three non-walkers in this group and all had normal hips.

Hemiplegics. All 12 of these patients could walk without assistance and none had abnormal hips.

We considered age as a possible factor in hip dislocation; but because this was a retrospective study it was not possible in most cases to determine when the hip abnormality had appeared. However, in the group at greatest risk (the bilateral hemiplegics), 14 of the 18 children were over the age of 10; subsequent dislocation would seem unlikely in the majority of these. Similarly, in the diplegic group, the youngest child with normal hips was aged eight years; the next oldest were 11 and 16 years and their hips are equally unlikely to deteriorate. In the hemiplegic group there were, of course, no problems at any age. It would thus seem that most of our patients had passed the age at which dislocation was likely to occur.

DISCUSSION

The primary object of this study was to establish whether certain patterns of neurological involvement in cerebral palsy were associated with a particularly high or low risk of spontaneous dislocation of the hip. Although the number of cases studied is comparatively small, the
results seem clear enough. In bilateral hemiplegia, where there is significant involvement of both upper and lower limbs, the risk is extremely high: 59% of the hips showed significant abnormalities and 20.5% were completely dislocated when reviewed at an average age of 12.6 years. At the opposite extreme, none of the hemiplegic patients had dislocated hips or indeed any significant radiographic abnormality. In the diplegics, where upper limb involvement was minimal, the risk appears to be extremely small and we suggest that the chances of subluxation and dislocation are commensurate with the symmetry of the condition and the extent of involvement of the upper limbs.

In the follow-up of children with cerebral palsy the status of the hips must always be a matter of concern to the orthopaedic surgeon. It is generally agreed that spontaneous dislocation results from gluteal weakness, and it is obviously important to assess this factor before undertaking any prophylactic surgery such as adductor myotomy or obturator neurectomy. Early radiographic changes have also been regarded by many as a warning of worse to come, and may also be an indication for early intervention (Sharrard 1971).

However, as with any form of prophylactic treatment, effectiveness cannot be assessed unless the natural history of the condition is well established. The danger always exists that unnecessary operations may be performed, but this will never be recognised if the outcome even without treatment is satisfactory. We would not dispute that the physical and radiographic findings in a child at any given time are of paramount importance in making a decision to operate; to stand idly by merely observing a child with adductor weakness and evidence of subluxation would clearly be wrong. However, from our investigation into the natural history, we suggest that, in cases with only early radiographic changes, the child's overall neurological pattern should also be given serious consideration before a decision to operate is made. Even when there is as yet no demonstrable hip abnormality, the information is useful in ascertaining how often the patient needs to be seen. Thus at one end of the scale, although the hemiplegic child may well show marked limitation of abduction, there seems to be no indication for early operation to prevent hip dislocation; while at the other extreme the bilateral hemiplegic child is at very considerable risk and may require much more frequent follow-up with a view to prophylactic surgery. We do not think it possible, however, to prescribe one method or approach; the age, the physical signs and the severity of the neurological involvement of each individual child must all be borne in mind.

Another factor which must be considered is the locomotor status of the patient. It has long been recognised that instability of the hip is more likely to be found in children who are non-weight-bearing. This has been abundantly confirmed in the present study. It nonetheless remains extremely difficult to disentangle cause and effect: a child's chances of walking, if already diminished by muscle weakness and spasm, will be further diminished by a dislocated hip. It has also been proposed many times that the lack of weight-bearing itself predisposes to dislocation; indeed, as long ago as 1919, Whitman suggested that the link lay in the development of coxa valga (due to the lack of normal weight-bearing) which in turn predisposes to dislocation.

Obviously this circular argument cannot be settled by our limited data. However, the important practical observation which emerges is that, if a child with cerebral palsy is able to walk independently, the overwhelming likelihood is that his hips are normal and will remain so.

REFERENCES