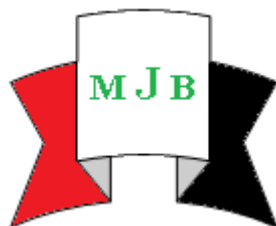


Assessment of Strabismus in Patients with Cerebral Palsy

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Abstract

Aim: To evaluate the type and severity of strabismus in cerebral palsy patients and the response to their medical treatment

Patients and Method.

This observational, cross-sectional, prospective study was done in Ibn Al-Haithem Teaching Eye Hospital, Baghdad, Iraq. It included 60 patients with Cerebral Palsy and strabismus. Complete history was taken and assessment of strabismus was done by cover, cover uncover and alternate cover test and Cycloplegic refraction. The degree of strabismus was measured by Hirschberg corneal reflex test and Krimsky test.

Results:

- 44 (73%) of the patients had Esotropia and alternating strabismus was found in 41(68%) patients.
- Regarding the degree of strabismus, 14(23%) were less than 10 degrees, 39 (65%) had 10- 30 degrees and 7(11.5%) had more than 30 degrees.
- Improvement in the degree of strabismus was noticed in 33(55%) patients in response to their medical treatment.
- Surgery was done on 4(7%) patients in whom 3 patients were under-corrected and 1 patient was over-corrected,

Conclusions

1- Esotropia is the commonest type of strabismus in patients with Cerebral Palsy

2 -55% of the patients had significant improvement regarding the degree of strabismus in response to their medical treatment given by paediatric-neurologist.

تقييم الحول في المرضى المصابين بالشلل الدماغي

الخلاصة

الهدف: لتقييم نوع وشدة الحول في مرضى الشلل الدماغي ودرجة الاستجابة للعلاج الطبي.
المرضى وأسلوب البحث: أنجزت هذه الدراسة في مستشفى ابن الهيثم التعليمي للعيون. شملت الدراسة ٦٠ مريضاً مصاباً بالشلل الدماغي والحول. تم أخذ التاريخ المرضي الكامل وتم تقييم الحول باختبار الغطاء، وكشف الغطاء. كما تم قياس درجة الخطأ الانكساري. وقياس درجة الحول باختبار الكريمسكي واختبار هرشبيرغ.

نتائج البحث:

- في ٤٤ (٧٣%) من المرضى كان الحول آنسي، وكان الحول متناوب في ٤١ (٦٨%).
- درجة الحول: في ١٤ (٢٣%) من المرضى كانت أقل من ١٠ درجات، و ٣٩ (٦٥%) من المرضى ١٠-٣٠ درجة و ٧ (١١,٥%) وكان أكثر من ٣٠ درجة-
- التحسن في درجة الحول لوحظ في ٣٣ (٥٥%) من المرضى استجابة للعلاج الطبي.

•التدخل الجراحي تم على ٤(٧%) من المرضى ، ٣ مرضى منهم كان تصحيح الحول اقل من الدرجة المطلوبة و مريض واحد كان التصحيح اكثر من المطلوب،

الاستنتاجات :

١. الحول الانسي هو الاكثر شيوعا بين انواع الحول في مرضى الشلل الدماغي.

٢. ٥٥% من المرضى كان لديهم تحسن ملحوظ في درجة الحول استجابة للعلاج الطبي لشلل الدماغ .

Introduction

Strabismus and visual abnormalities are common in cerebral palsy this high incidence is probably related to lesion in subcortical oculomotor center or cerebellar lesion which disrupts the binocular vision[1].

Although esotropia is more common, other ocular deviations reflecting a different neurologic basis may be the reason for presentation. The inclination to correct these cases deserves more attention. Parents often state that with the straightening of eyes the child's general performance improves[2].

As Cerebral Palsy is usually associated with a wide spectrum of developmental disorders, a multidisciplinary approach is most helpful in the assessment and management of such children[3]. A close collaborative working relationship between the pediatric ophthalmologist and the pediatrician will be essential[4]. The diversity of individuals with cerebral palsy together with the range of severity and complications make this condition a challenge for health care system [5].

Medicines can help control some of the symptoms of cerebral palsy, prevent or minimize complications, and treat other medical conditions related to cerebral palsy. Most common medications used include: [11- 14]

1.Antispasmodics are the most common medicines used for people with cerebral palsy. They can help relax tight muscles and reduce muscle spasms

A. Oral antispasmodics:

- Diazepam.
- Baclofen.
- Dantrolene.

B. Intrathecal baclofen (ITB). This pump releases baclofen into the fluid around the spinal cord.

C. Injectable antispasmodics,. These medicines typically remain effective for about 3 to 8 months,. These include

- Phenol or alcohol "washes."
- Botulinum toxin (Botox) type A with or without casting; may reduce spasticity for 3-6 months .It is undergoing study for the management of spasticity in specific muscle groups, and the preliminary findings show a positive response in those patients studied. [6, 7 ,8, 9, 10] .

2.Anticonvulsants are used as treatment for seizures, include:

- Gabapentin.
- Lamotrigine.
- Topiramate.

3.Anticholinergics help a minority of patients who have uncontrollable body movements (dystonic cerebral palsy) or who drool frequently. These include:

- Benztropine mesylate.
- Carbidopa-levodopa.
- Glycopyrrolate.
- Trihexyphenidyl.

Patients and Method

An observational, cross-sectional, prospective study was carried out at Ibn Al-Haithem Teaching Eye Hospital, from January 2012 to February 2013. In the last three months no new patients were added.

Children with Cerebral Palsy less than 12 years of age presented with strabismus were divided into six groups according to their age as follows: Group1 (0-2 yrs) Group2 (2-4 yrs) Group3 (4-6 yrs) Group4 (6-8yrs) Group5 (8-10yr) Group6 (10-12yrs).

History was taken regarding: gender, age, prenatal history, history of labour asphyxia, history of jaundice and need for phototherapy or blood transfusion, history of prematurity (less than 37 weeks gestational age) or low birth weight (less than 2500 g), age of presentation of Cerebral Palsy, and of strabismus and which one was diagnosed first and if strabismus surgery was done or not in patients with strabismus and

whether this surgery is done before or after medical treatment of Cerebral Palsy. Clinical assessment of strabismus was established by cover, cover uncover and alternate cover test and Cycloplegic refraction. The degree of strabismus was measured by Hirschberg corneal reflex test (light torch and occlude were used) and Krimsky test. Prism cover test could not be done in most patients because they were uncooperative. Patients were followed up regarding the degree of strabismus. Some patients underwent surgery during this period.

Results

A total of 60 patients with Cerebral Palsy were included in this study.

Table 1 Types of strabismus.

Group .No.	Strabismus type [no. (%)]					
	[No. (%)]	Eso	exo	hypertropia	hypotropia	mixed
Gr.1(0-2yr)	15(60%)	10(67%)	5(33%)	0	0	0
Gr.2(2-4yr)	17(59%)	12(70%)	3(18%)	0	1(6%)	1(6%)
Gr.3(4-6yr)	12(57%)	11(92%)	1(8%)	0	0	0
Gr.4(6-8yr)	8(53%)	5(62.5%)	2(25%)	1(12.5%)	0	0
Gr.5(8-10yr)	4(100%)	3(75%)	1(25%)	0	0	0
Gr.6(10-12yr)	4(100%)	3(75%)	1(25%)	0	0	0
Total	60	44(73%)	13(22%)	1(1.65%)	1(1.65)	1(1.65%)

Table 2 Laterality of strabismus.

Group No.	Strabismus laterality [no. (%)]			
	{No. (%)}	OD	OS	Alternating
Gr.1(0-2yr)	15(60%)	3(20%)	2(13%)	10(67%)
Gr.2(2-4yr)	17(59%)	7(41%)	0	10(59%)
Gr.3(4-6yr)	12(57%)	0	2(17%)	10(83%)
Gr.4(6-8yr)	8(53%)	3(37.5%)	1(12.5%)	4(50%)
Gr.5(8-10yr)	4(100%)	1(25%)	0	3(75%)
Gr.6(10-12yr)	4(100%)	0	0	4(100%)
Total	60	14(23%)	5(8%)	41(68%)

Table 3 Degree of strabismus.

Group No.	[No. (%)]	(<10)	(10-30)	(>30)
Gr.1(0-2yr)	15(60%)	2(13%)	9(60%)	4(26.6%)
Gr.2(2-4yr)	17(59%)	4(23%)	12(70%)	1(6%)
Gr.3(4-6yr)	12(57%)	3(25%)	8(66.6%)	1(8.3%)
Gr.4(6-8yr)	8(53%)	1(12.5%)	7(87.5%)	0
Gr.5(8-10yr)	4(100%)	4(100%)	0	0
Gr.6(10-12yr)	4(100%)	0	3(75%)	1(25%)
Total	60	14(23%)	39(65%)	7(11.6%)

Table 4 Improvement in degree of strabismus in response to medical treatment for Cerebral Palsy.

Group No.	No. (%)	Partial improvement	Complete improvement	Same
Gr.1 (0-2yr)	15 (60%)	8 (53%)	0	7 (47%)
Gr.2 (2-4yr)	17 (59%)	6 (35%)	2 (12%)	9 (53%)
Gr.3 (4-6yr)	12 (57%)	7 (58%)	2 (17%)	3 (25%)
Gr.4 (6-8yr)	8 (53%)	3 (37.5%)	1 (12.5%)	4 (50%)
Gr.5 (8-10yr)	4 (100%)	1 (25%)	2 (50%)	1 (25%)
Gr.6 (10-12yr)	4 (100%)	0	1 (25%)	3 (75%)
Total	60	25 (42%)	8 (13%)	27 (45%)

Table 5 Outcome of strabismus surgery.

Group No.		No of cases that underwent surgery.	correction	
			under	over
Gr.1(0-2yr)	15(60%)	1 (7%)	1	0
Gr.2(2-4yr)	17(59%)	0	0	0
Gr.3(4-6yr)	12(57%)	0	0	0
Gr.4(6-8yr)	8(53%)	2 (25%)	1	1
Gr.5(8-10yr)	4(100%)	0	0	0
Gr.6(10-12yr)	4(100%)	1	1	0
Total	60	4 (7%)	3 (75%)	1 (25%)

Discussion

Cerebral Palsy is the third most common developmental disability after autism and mental retardation [5].

In this study, the incidence of esotropia was highest in comparison with other types of strabismus. This was comparable with what had been reported in other studies done by Ghasia F,

Brunstrom-Hernandez J and Tychsen L[15].

Our study showed that there was improvement in the degree of strabismus after receiving treatment (given by pediatric-neurologist) and the total rate of improvement was 55% (42% partial improvement and 13% complete improvement). During the follow up Strabismus surgery was done for only 4 (7%) patients, one of them ended with overcorrection that patient had surgery before medical treatment for Cerebral palsy was established. Consecutive exotropia was also a finding in the study done by Ghasia F, Brunstrom-Hernandez J and Tychsen L[15]. ,and also in a study done in Korea by Dae Joong Ma, Hee Kyung Yang and Jeong-Min Hwang[16], also it was proved by Zohar Habot-Wilner, Abraham Spierer , Irina S. Barequet, Tamara Wygnanski-Jaffe[17]. In 1975 Hiles DA, Wallar PH, McFarlane F, found that neurologically impaired patients with Esotropia tend to be overcorrected[18].

Some congenitally esotropic children with cerebral palsy gradually improve or change to exotropia without surgery [19].

A more conservative approach to neurologically abnormal children allows an increased time interval for the development of a stable preoperative oculomotor alignment [18].

Conclusions

1- Esotropia is the commonest type of strabismus in patients with Cerebral Palsy

2 -55% of the patients had significant improvement regarding the degree of strabismus in response to their medical treatment given by paediatric-neurologist.

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