

Changing Trends in Clinical Profile of Cerebral Palsy

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Abstract

Background : There may be change in clinical spectrum of cerebral palsy (CP) due to improvement in maternal and child care health service. The clinical profile, aetiological factors and comorbidities of children with CP attending Department of PMR, VMMC & Safdarjang Hospital during the years 1981- 1989 and 2008 - 2012 were therefore compared and analysis done.

Methods: Four hundred and ten (group B) children with CP registered in last 4 years (2008 - 2012) at PMR Department of VMMC & Safdarjang Hospital were compared with previous study of 544 (group A) children during year 1981 - 1989 from same centre.

Results : Spastic CP remained most common in both the groups. Diplegia is commonest type of CP (38.78%) as compared to previous group where quadriplegia (34.9%) was most common. The mixed type showed a statistical significant increase in percentage (group A: 0.18 % versus group B: 3.7 %).

In aetiology, there is decrease in prenatal and postnatal causes and increase in natal causes which were statistically significant. Birth asphyxia (50.3 %) remains the main aetiological factor as earlier (24.5%). Speech problems (59.7%), mental retardation (31.7%) and seizures (26.8%) are common comorbidities as compared to previous studies where mental retardation (47.2 %) was found to be most common followed by speech impairment (37%), visual impairment (9%) and seizures (8.8%).

Conclusions : Clinical profile of CP has evolved with an increase in diplegic and a decrease in quadriplegic CP.

Key words: Cerebral palsy, clinical profile.

Introduction:

Cerebral palsy (CP) is the commonest physical disability in childhood, occurring in 2-2.5/1000 births and it occurs in all races¹. CP is described as a group of developmental disorders of movement and posture, causing activity limitation, that are attributed to non-progressive disturbances occurring in the developing foetal or infant brain. The motor disorders

of CP are often accompanied by disturbances of sensation, cognition, communication, perception, and/or behaviour, and/or by a seizure disorder².

Clinical profile of CP in developing countries is different from that in developed countries^{3,4}. With advancement in maternal and neonatal care and trend of increasing survival of preterm babies in developing countries clinical profile in developing countries is showing a gradual change⁵.

Hence, this study was aimed to evaluate the clinical profile, types and aetiologies of CP along with associated comorbidities in our centre and compare to previous study⁶ at same centre.

Materials and Methods:

This study included 410 consecutive children with CP attending at the Department of Physical Medicine & Rehabilitation at VMMC & Safdarjang Hospital, New Delhi from 2008- 2012 (group B) . A detailed history including sociodemographic, family structure,

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prenatal and postnatal history was elicited using a prestructured proforma, followed by a complete physical, developmental and neurological examination. Assessment of intelligence/developmental quotient (IQ/DQ), ENT and ophthalmological evaluation were performed in all children. The data were compared with that of 544 children (group A) who attended PMR Department during 1981-1989.

CP was classified using following classification⁷:

By tone pattern : Spastic, dyskinetic, hypotonic, mixed and by distribution of limb involvement : Quadriplegia, diplegia, hemiplegia, triplegia.

Aetiology : (i) Prenatal (ii) natal (iii) postnatal (iv) > 1 cause (where more than one factor seems to play role) (v) No apparent cause.

For birth asphyxia, Apgar scores were taken into account when available, or the following criteria were used : (i) History of delayed cry > 5 minutes after birth; (ii) baby turning blue and requiring oxygen therapy, with difficulty in respiration, lethargy and/or seizures within 72 hours of birth⁵.

Change in trend was analysed in comparison to our previous study at same centre. For analysis data from previous study (group A) and recent data comprised group B. Statistical analysis was done by Student’s t test for significance (using SPSS software version 17).

Table 1: Sexwise Distribution of Cases

Sex	Group A	Group B
Male	354 (65.1%)	269 (65.6%)
Female	190 (34.9%)	141 (34.4%)
Total	544	410

Table 3: Topographic Distribution of Cases

Topographic distribution	Group A	Group B	P-value
Quadriplegia	190 (34.9%)	109 (26.6%)	0.005
Diplegia	119 (21.9%)	159 (38.78 %)	0.000
Hemiplegia	156 (28.7%)	86 (20.97%)	0.003
Paraplegia	24 (4.4%)		
Monoplegia	5 (0.9%)		
Triplegia	3 (0.6%)	10 (2.4%)	0.002
Total	497	364	

Results :

In group B total number of patients was 410. Patients age ranged from 7 months to 17 years with a mean age of 5 years 2 months. There was male preponderance with a sex ratio of 1.9 : 1 (M:F) similar to previous study (Table 1).

Among the different types of CP, spastic CP remained the most common in both the groups. The mixed type showed statistically significant increase in group B (group A: 0.18%, group B: 3.7%, p = 0.000). The pattern remained same for hypotonic and dyskinetic types (Table 2).

Among the spastic type, quadriplegia (group A: 34.9% versus group B:26.6%) and hemiplegia (group A: 28.7% versus group B: 20.97%) were more in group A, and diplegia more in group B (group A: 21.9% versus group B:36 %). The difference was statistically significant (Table 3).

Amongst the associated disabilities, mental retardation (47.2 %) was found to be most common in group A, followed by speech impairment(37%), visual impairment (9%), seizures (8.8%) and auditory impairments (2.9%). In group B, speech impairment (59.7%) was the most common associated disability followed by mental retardation (31.7%), seizures (26.8%), visual impairment (17.8%) and auditory impairment (2.68%). Except auditory impairment, the difference between the other associated disabilities was statistically significant between both the groups (Table 4).

Table 2. Distribution of Cases according to Types of CP

Types of CP	Group A	Group B	P-value
Spastic	497 (91.4%)	364 (88.8%)	0.191
Hypotonic	30 (5.5%)	22 (5.4%)	0.920
Dyskinetic	16 (2.9%)	09 (2.2%)	0.476
Mixed	1 (0.18%)	15 (3.7%)	0.000
Total	544	410	

Table 4. Distribution of Cases according to Associated Disabilities

Disabilities	Group A	Group B	P-value
Mental retardation	257 (47.2%)	130 (31.7%)	0.00
Speech impairment	201 (37%)	245 (59.7%)	0.00
Visual impairment	49 (9%)	73 (17.8%)	0.00
Seizures	48 (8.8%)	110 (26.8%)	0.00
Auditory	16 (2.9%)	11 (2.68%)	0.81

Table 5. Distribution of Cases according to Aetiology

Aetiological groups	Group A	Group B	P-value
Prenatal	42 (7.7%)	15 (3.65%)	0.006
Natal	238 (43.8%)	228 (55.6%)	0.000
Postnatal	142 (26.1%)	30 (7.3%)	0.000
>1 cause	79 (14.5%)	80 (19.5%)	0.044
No apparent cause	43 (7.9%)	57 (13.9%)	0.004
Total	544	410	

In aetiological groups, there was decrease in prenatal and postnatal in group B whereas natal group, > 1 cause group and no apparent cause group were increased as compared to group A. The difference was statistically significant (Table 5).

Discussion :

In this study, there is a male preponderance in both the groups (group A: M:F = 1.86 : 1 and group B: M:F = 1.9 : 1). Sharma *et al*⁸ found the male to female ratio 2.42:1 in their study of 480 CP patients. Similar results were obtained by Pharoah *et al*⁹ who found a M:F of 1.3:1 in a study of 1612 cases .

Spastic CP remained the most common in both the groups (group A 91.4% , Group B 88.8%) followed by hypotonic (group A 5.5% , group B 5.4%) and dyskinetic (group A 2.9% , group B 2.2%) . Mixed type showed statistically significant increase in group B (group A: 0.18%, group B: 3.7%). Similar pattern was observed by Sharma *et al*⁸ who found spastic CP as most common (77.9%) followed by hypotonic (8.5%), dyskinetic (8.5%) and mixed (3.9%). Singhi *et al*³ and Singhi and Saini⁵ in both of their studies found spastic CP as the most common type.

Spastic quadriplegia was the commonest type of CP in developing countries where as spastic diplegia is commoner in the developed world⁵. Comparison of

group A and group B showed proportion of diplegia has increased (21.9% group A - 38.78% group B) being the most common spastic type and quadriplegia has decreased (34.9% group A - 26.6% group B) showing an evolving clinical spectrum of CP in developing countries. This change in trend can be attributed to better neonatal services and higher rates of premature survivors. In the study by Singhi and Saini⁵ spastic quadriplegia was found to be the commonest type of CP (51.5%) although lesser than previous decade (61%) and there was an increase in number of diplegic CP. Sharma *et al*⁸ in their study in 1999 also found diplegia (54%) to be most common among spastic CP followed by quadriplegia (15%). However Pharoah *et al*⁹ found quadriplegia to be most common (36%) followed by hemiplegia (32.6%) and diplegia (22.3%).

In the present study in group B, we found that there was a statistically significant increase in speech impairment, visual impairment and seizures disorder; and a statistically significant decrease in mental retardation as compared to our previous study in group A. In the study by Sharma *et al*⁸, subnormal intelligence was the most common handicap (74.2%), followed by speech defects (53.5%), ocular defects (35.8%) and convulsions (25.6%). Singhi *et al*³ found that associated problems were present in majority (75 %) of cases, of which mental retardation was the commonest (72.5 %) whereas in study by Singhi and Saini⁵ speech problems

(83.7%), microcephaly (64.27%), seizures (44.5%) and intellectual disability (38.61%) were the common comorbidities.

In this study, amongst the aetiological groups, there was decrease in prenatal (7.7 % group A - 3.65% group B) and postnatal cases (26.1% group A - 7.3% group B) whereas in natal group (43.8% group A - 55.6% group B), > 1 cause group (14.5% group A - 19.5% group B) and no apparent cause group (7.9% group A - 13.9% group B) , cases were increased as compared to our previous study. The difference was found to be statistically significant. Similar results were obtained by Singhi and Saini⁵ who found a decrease in congenital and postnatal groups . In our study the contribution of birth asphyxia as natal cause has increased from 24.5 % to 50.7%. Similarly Sharma *et al* ⁸ found perinatal asphyxia in (48.7%) to be the single most common predisposing factor. Singhi and Saini⁵ also found birth asphyxia remained the main (51.98%) etiological factor as earlier (45.3%). Since natal causes are the leading predisposing factors in cases of CP, there is an urgent need to further strengthen the existing maternal and child health care services in the country.

Conclusions :

The present study reflects a change in trend in clinical profile of CP with an increase in diplegic and decrease in quadriplegic CP. Natal factors particularly birth asphyxia is the major predisposing factor and highlights the need for improved maternal and child health services.

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