



## Co Morbidities Associated With Cerebral Palsy Children

### KEYWORDS

Cerebral palsy , Comorbidities

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**ABSTRACT** Aims and Objectives: To study the co morbidities associated in cerebral Palsy patients.

**Materials and Methods:** A hospital based prospective observational study carried out during the period of January 2014 to June 2015 at the Department of Pediatrics in Smt. Kashibai Navale Medical College and General Hospital. All the children suffering from cerebral Palsy were included in the study. The patients were examined thoroughly and co-morbidities associated were recorded. **Results :** Fifty-five cerebral palsy children were included in the study. 34 (61.8%) patients were male and 38 (38.2%) were females. There were 50 (90.9%) spastic CP. 3 (5.4%) hypotonic CP and 2 (3.7%) dyskinetic CP. Out of the 50 spastic CP patients 30(60%) were diplegic, 14 (28%) were quadriplegic , 5(10%) were hemiplegic and 1 (2%) was paraplegic. The commonest co morbidity associated with these patients was severe malnutrition. Intellectual Disability and language delay were the second commonest associations. Other comorbidities associated were seizures(38.2%) , drooling(58%) , dysphagia (50%), GERD , constipation(43%), strabismus (54%), refractive errors (12.7%), hearing loss(29.1%), contractures(60%), urinary tract infections(49.1%), sleep disorders (38.2%), dental caries( 56.4%) and behavioral problems(32.7%). **Conclusion:** While managing the cases of Cerebral Palsy , it is imperative to ascertain the comorbidities associated with effective and better management. Most children with developmental disability have lifelong impairments. The primary physician caring for these children is at the core of care provision.

### Introduction.

Cerebral palsy is a common developmental disability first described by William Little in the 1840s. The condition poses considerable diagnostic and therapeutic challenges to the physician with degree of involvement ranging from mild with minimal disability to severe, associated with several co morbid conditions. It is one of the three most common life long developmental disabilities, the other two being autism and mental retardation causing considerable hardship to affected individuals and their families. The pediatrician caring for these children has to ensure multidisciplinary liaison and a systematic evaluation of impairments and the various co-existing co-morbidities which often cause limitation of activity. In this study we will focus on the co – morbidities of cerebral palsy.

### Methodology

Aim and objective :

To study the co morbidities associated in cerebral Palsy patients.

### Materials and Methods

#### Detailed Research Plan

#### Study Design

Hospital based prospective study

Source of Data : All the children suffering from cerebral palsy

### Selection Of Subjects

Inclusion Criteria

All the children admitted in SKNMC Pediatric Ward suffering from cerebral Palsy

Exclusion Criteria : Nil

### Methodology

This is a hospital based prospective observational study to be carried out during the period of January 2014 to June 2015 at the Department of Pediatrics in Smt. Kashibai Navale Medical College and General Hospital. All the chil-

dren suffering from cerebral Palsy were included in the study. The included patients were classified according to topographical and physiological classification. The patients were examined thoroughly and co-morbidities associated were recorded. They were investigated accordingly.

### Results

The study conducted included 55 cerebral palsy patients. 34 (61.8%) patients were male and 38 (38.2%) were females. More than 45 percent (45.5%, n= 25) were born preterm (< 34 weeks GA), 16.4% (9) were born late preterm (34 – 37 weeks) and 38.2% (21) were born at term.

Out of the 55 patients , 32.7% (18) had a normal birth weight, 25.5% ( 14) were low birth weight ( < 2500gms) , 34.5% ( 19) were Very Low Birth Weight ( < 1500gms) and 7.3% (4) were Extremely Low Birthweight.

The patients were classified based of physiological type and there were 50 (90.9%) spastic CP. 3 (5.4%) hypotonic CP and 2 (3.7%) dyskinetic CP. Spastic cerebral palsy were further classified topographically and out of the 50 spastic CP patients 30(60%) were diplegic, 14 (28%) were quadriplegic , 5(10%) were hemiplegic and 1 (2%) was paraplegic.

### The comorbidities recorded were as follows :

**Malnutrition :** Eighty nine percent (49) patients were malnourished, with their height and weight below the 3<sup>rd</sup> percentile. Children upto five years of age (n=39) were classified according to WHO weight for height charts and 87.1% (34) children were found in the category of Severe acute malnourished (SAM) and remaining in Moderate Acute malnourished (MAM).

**Gastrointestinal system :** 58.0% (32) had drooling , 50.9% (50 ) had dysphagia , 43.9% (49) had constipation and 65% ( 36) had Gastroesophageal reflux disease.

Neurological disorders : Seizure disorder is one of the most common comorbidities seen in children with cerebral palsy or intellectual disabilities.

38.2% (22) had seizure disorder. Five patients of these had intractable seizures and on multiple antiepileptic drugs.

Visual Problems : The severity of visual dysfunction in cerebral palsy may be quite variable, which can range from mild to severe. In our study 54.5% (30) had strabismus and 12.7% (7) had refractive errors .

Co-morbidity	All (n=55)	
	No. of cases	% of cases
Gastro System		
Drooling	32	58.0
Dysphagia	28	50.9
Constipation	24	43.6
Nutritional		
Under nutrition	48	87.3
Obesity	1	1.8
Ophthalmology		
Strabismus	30	54.5
Refractive Errors	7	12.7
Other		
Hearing Loss	16	29.1
Language Delay	44	80.0
Contractures	33	60.0
UTI	27	49.1
Sleep Disorder	21	38.2
Dental Caries	31	56.4
Epilepsy	21	38.2
Beh. Problems	18	32.7
ADHD	11	20.0

The other comorbidities associated were seizures(38.2%) , drooling(58%) , dysphagia (50%), GERD , constipation(43%), strabismus (54%), refractive errors (12.7%), hearing loss(29.1%), contractures(60%), urinary tract infections(49.1%), sleep disorders (38.2%), dental caries( 56.4%) (Table 1)

### Discussion.

Irrespective of the type of cerebral palsy , all the patients do have some or the other co morbidity. Intellectual Disability is very common in cerebral palsy patients with prevalence of more than 90 percent. Children with spastic quadriplegia have greater degree of cognitive impairment than children with spastic hemiplegia.

Visual impairments and disorders of ocular motility are common (28%) in children with CP. There is an increased presence of strabismus, amblyopia, nystagmus, optic atrophy, and refractive errors. Hearing impairment occurs in 12% of children with CP. Epilepsy is common in children with CP. And 35% to 62% of children develop epilepsy. Children with spastic quadriplegia (50% to 94%) or hemiplegia (30%) have a higher incidence of epilepsy than patients with diplegia or ataxic CP (16 to 27%). In an Indian study, it was found that 35% had epilepsy. 66% of children with spastic hemiplegia, 43% of spastic quadriplegia and 16% of children with spastic diplegia had seizures as an associated feature.

### Gestational age and Comorbidities of Cerebral Palsy.

Organ development is a function of gestation. Completion of the intrauterine life is just as important for the brain , as is for the lungs or any other organ in the body. A premature brain is vulnerable to pressure changes , hemorrhage and infective insults. In our study , 45.5% (25) born babies were preterm ( < 34 weeks GA) while 16.4% (9) were late preterm ( 34 – 37 weeks GA). However no correlation was

found between the Gestational Age and the comorbidities in the cerebral palsy patients.

### Correlation of cerebral palsy comorbidities with the type of CP.

In our study ( which was also comparable to other studies) , diplegic cerebral palsy children and hemiplegic cerebral palsy children were found to have lesser degree of intellectual disability and better cognitive function. Owing to enhanced intellect , the subsequent comorbidities related to it like dependency and bad hygiene ( and subsequent infections ) were found to be less. In quadriplegic cerebral palsy , dyskinetic cerebral palsy and mixed cerebral palsy ,the frequency and the degree of comorbidities were found to be much more as compared to diplegic and hemiplegic cerebral palsy patients.

### Gastrointestinal system.

In our study we found that , 58.0% (32) had drooling , 50.9% (50 ) had dysphagia , 43.9% (49) had constipation and 65% ( 36) had Gastroesophageal reflux disease.

Dysphagia is a problem in more than half of children with CP. It is closely related to the severity of the neurological impairment. Oral motor dysfunction is a major contributing factor to limited food intake and clinically significant malnutrition in children with moderate to severe CP.

Drooling and aspiration pneumonia are other direct consequences of oral motor dysfunction. Uncoordinated swallowing increases the risk of pulmonary aspiration which may or may not be heralded by recurrent coughing and choking with feeds. Drooling can be a very difficult management problem. Gastroesophageal reflux (GER) is common in children with cerebral palsy and occurs in 65-75% of cases. By the virtue of this around 89% (50) were found to be malnourished.

### Hearing impairment

Variable loss of hearing can accompany cerebral palsy. We , in our study found around 29.1% (16) of the included patients had impaired hearing.

### Conclusions

Cerebral palsy is a common neurodevelopmental condition encountered by pediatricians. This condition has a very wide clinical spectra. Cerebral palsy is invariably associated with many deficits such as mental retardation, speech/ language and oromotor problems, malnutrition , constipation , infections and many more comorbidities. The consulting paediatrician should carefully evaluate each of these problems to facilitate complete treatment. A multidisciplinary liaison and a systematic evaluation of impairments and the often co-existing co-morbidities is essential. This enables the reduction in activity limitation and ensures optimum participation and integration of these children in the family and community. All these efforts result in the maximal enablement of the disabled children.