

## A Clinic-Epidemiological Profile and Functional Disability in of Patients of Cerebral Palsy

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### Abstract

**Aim:** The aim of the present study was to assess the clinical profile of patients of cerebral palsy and to assess the spectrum of functional disability.

**Methods:** The present study was done in the Pediatric Department of NMCH, Patna. The present study is the observational study conducted for a period of one year. A total of 200 patients diagnosed with cerebral palsy attending the OPD of the pediatric department were included in the study. All the patients belonged to the age group of upto 12 years.

**Results:** In the present study, most of the participants belonged to 2-5 years of age and 65% were male. According to nutritional status, majority of the patients belonged to grade III. Among them, 49% were generalized tonic-clonic seizures, myoclonic seizure (29%), febrile seizure (6%), refractory seizure (9%) and status epilepticus (7%). GMFCS score 5 was seen in 28% (mostly quadriplegic), followed by GMFCS level 1, 23% (mostly hemiplegic), others mostly diplegic in level 3 (21%), level 2 and 4 (14%).

**Conclusion:** In present study, children between 2 to 5 years with male preponderance were mainly noted. Diplegic CP patients were most common and equally distributed between GMFCS 2 to 4. Perinatal factors (asphyxia) were main etiological risk factor. Multidisciplinary CP clinic also provide more satisfaction thus compliance for rehabilitation.

**Keywords:** Cerebral Palsy, Autism, ADHD, Seizures

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### Introduction

Cerebral palsy (CP) is the commonest neurodevelopmental disorder of childhood because of a non-progressive damage to the brain, which leads to various activity limitations caused by progressive postural and movement disturbances. Different prenatal, perinatal, and postnatal complications can lead to impairments such as motor dysfunctions, sensory disturbances, perception, intellectual problems, behavior issues, epilepsy, and secondary musculoskeletal problems. [1]

Globally published literature has reported that the range of CP from 1.5 to 4 per 1000 live births but the prevalence range reported for India is higher ranging from 2.08 to 3.88 per 1000 live births. [2] Previously, Persons with Disability (PwD) act of India recognized disability in terms of visual, speech, hearing, locomotor, and mental disability. Recently, amendments in the act were done and The Rights of Persons with Disabilities (RPwD) Act, 2016 now covers CP in the sub-classification of

physical disability as a locomotor disability. [3] It has been reported in the previous studies that awareness regarding the rights and legislations for the disabled is lower in India. [4] Socio-economic, physical, and psychological stress associated with raising a CP child has been studied by various researchers in India and in the state of Gujarat. [5-7] It has been reported in these studies that parents and families of CP children are experiencing higher levels of stress and depression and, on the whole, have a lower quality of life as compared to parents of healthy children. [6-8]

CP is reported to have various prevalence rates and clinical patterns between geographical areas. This may be because of different causes including etiological factors, use of different classification systems, quality of the study, and sample size included in the study. With increase in numbers and quality of healthcare facilities, actual survival rates of pre-mature and low birth weight babies have increased. A recent systematic review by Chauhan

et al [2] (2019) has described paucity of high-quality population-based prevalence studies on CP in India and reported overall pooled prevalence of CP per 1000 live births to be 2.95. They also emphasized the need for a large-scale good quality community-based studies for evaluating risk factors and clinical profiles of CP children from different age groups. Since CP is a continuing problem, it is important to study and explore the causes and the newer aspects of the condition for proper understanding and management. It causes considerable psychological and financial burden to the caregivers. As there is no cure of CP, hence a need for primary prevention of disease. But unfortunately, the aetiology of cerebral palsy is poorly understood thereby eluding a definitive prevention strategy.

The aim of the present study was to assess the clinical profile of patients of cerebral palsy and to assess the spectrum of functional disability.

### Materials and Methods

The present study was done in the Pediatric Department of NMCH, Patna. The present study is the observational study conducted for a period of one year. A total of 200 patients diagnosed with cerebral palsy attending the OPD of the pediatric department were included in the study. All the patients belonged to the age group of upto 12 years. Children with non-central causes of motor deficits and children with the progressive neurological disorder were excluded from the study.

The three essential features were considered for the diagnosis of cerebral palsy: a) Presence of impairment of neurological function, especially voluntary motor activity, b) The disorder is non-progressive and non-hereditary, c) The disorder is present since birth or early infancy. Cerebral palsy

is a clinical diagnosis made by an awareness of risk factors, regular developmental screening of all high-risk babies, and neurological examination.

As in all medical conditions, a systematic approach focusing on maternal, obstetric and perinatal histories, review of developmental milestones, and a thorough neurological examination and observation of the child in various positions such as supine, prone, sitting, standing, walking and running was made.

CP is classified based on the type of neuromuscular deficit into (i) spastic (ii) dyskinetic (inclusive of choreo-athetoid and dystonic) (iii) ataxic (iv) hypotonic and (v) mixed. Further classification of the type of spastic cerebral palsy depends on the topography of involvement. Complete evaluation of a child with CP included an assessment of associated deficits like vision, speech and hearing, oromotor evaluation, epilepsy, and cognitive functioning.

EEG: is indicated in children presenting with seizures, history of neonatal seizures, underlying malformation/ lesion of the brain found on neuroimaging, and during follow-up.

Statistical Methods: Descriptive statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean±SD(Min-Max) and results on categorical measurements are presented in Number (%).Significance is assessed at a 5% level of significance. The following assumptions on data are made, Assumptions: 1. Dependent variables should be normally distributed. Samples drawn from the population should be random. Cases of the samples should be independent.

### Results

**Table 1: Demographic data and nutrition status**

Age	N (Percentage)
<2 years	66 (33%)
2-5 years	78 (39%)
5-10 years	36 (18%)
>10 years	20 (10%)
<b>Gender</b>	
Male	130 (65%)
Female	70 (35%)
<b>Nutritional Status</b>	
Grade I	32 (16%)
Grade II	48 (24%)
Grade III	60 (60%)

In the present study, most of the participants belonged to 2-5 years of age and 65% were male. According to nutritional status, majority of the patients belonged to grade III.

**Table 2: Type of cerebral seizures**

Type of seizures	Number of children	%
GTCS	98	49
Myoclonic	58	29
Refractory	18	9
Status epilepticus	14	7
Febrile seizures	12	6

Among them, 49% were generalized tonic-clonic seizures, myoclonic seizure (29%), febrile seizure (6%), refractory seizure (9%) and status epilepticus (7%).

**Table 3: Gross Motor Function Classification System (GMFCS): HCP-hemiplegic CP, DCP- diplegic CP, QCP- Quadriplegic CP, MCP-Monoplegic CP**

GMFCS Score	No of patients	Type of Spastic CP	Mean Age (range) years	Percentage
Level 1	46	9HCP+1MCP	7.5 (5-16)	23
Level 2	28	6DCP+1HCP	7.14 (4-12)	14
Level 3	42	DCP	5.11 (3-9)	21
Level 4	28	DCP	5.71 (2-10)	14
Level 5	56	13QCP+1DCP	3.57 (2-8)	28

GMFCS score 5 was seen in 28% (mostly quadriplegic), followed by GMFCS level 1, 23% (mostly hemiplegic), others mostly diplegic in level 3 (21%), level 2 and 4 (14%).

### Discussion

Cerebral palsy (CP) is the most common type of motor disability in childhood. [9] Its incidence in India around 3 cases per 1000 live births; however, being a developing country, the actual figure may be much higher. There are increasing evidences suggesting rise in prevalence of CP. [10] Profile of CP in developing country is also different from developed countries. [11] Modern improved obstetric and advanced prenatal care had resulted in increased survival of low birth weight babies and is associated with an increased proportion of cerebral palsy in these babies. [12] It covers a group of conditions involving a combined disorder of movement, posture, and motor function and may be associated sensory, neurological and musculoskeletal complications. It is a permanent condition, attributed to nonprogressive disturbances that occurred in the developing foetal or infant brain. [13]

In the present study, most of the participants belonged to 2-5 years of age and 65% were male. According to nutritional status, majority of the patients belonged to grade III. Singhi PD et al [3] in their study males formed 67.5% of all cases, Srivatsava VK et al [14] study said males were 65.1%. Disabled children are of great concern to the family as well as to the society. After eradication of polio, Cerebral Palsy (CP) has emerged as one of the major causes of chronic childhood disability in India. Cerebral Palsy has been defined as a group of permanent disorders of the development of movement and posture, causing activity limitation, that are attributed to non-progressive disturbances

that occurred in the developing fetal or infant brain. The motor disorders of Cerebral Palsy are often accompanied by disturbances of sensation, perception, cognition, communication and behavior, by epilepsy, and by secondary musculoskeletal problems. [6] The worldwide prevalence of CP ranges from 1.5 to more than 4 per 1000 live births or children of a defined age range. [15]

Among them, 49% were generalized tonic-clonic seizures, myoclonic seizure (29%), febrile seizure (6%), refractory seizure (9%) and status epilepticus (7%). GMFCS score 5 was seen in 28% (mostly quadriplegic), followed by GMFCS level 1, 23% (mostly hemiplegic), others mostly diplegic in level 3 (21%), level 2 and 4 (14%). Higher the GMFCS score and a higher risk of hip dislocation observed some studies, Children with a GMFCS score of 4 or more have a risk of hip dislocation. [16,17] Singhi et al (2002)<sup>3</sup> reported that hemiplegics had a predilection to develop behavioural problems and this was also encountered in this study. Hoffer et al<sup>28</sup> reported that contractures in Cerebral Palsy (CP) were usually in flexion at the hips and knees, and in plantar flexion at the ankles.

### Conclusion

In present study, children between 2 to 5 years with male preponderance were mainly noted. Diplegic CP patients were most common and equally distributed between GMFCS 2 to 4. Perinatal factors (asphyxia) were main etiological risk factor. Multidisciplinary CP clinic also provide more satisfaction thus compliance for rehabilitation.

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