

# Known Risk Factors and Co-morbidities in 100 Cases of Cerebral Palsy: in a Neurology Follow up Clinic

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## Abstract:

**Background:** Cerebral palsy (CP) is a major cause of crippling in children. Several antenatal, natal and post natal factors for CP like birth asphyxia and preterm & LBW deliveries were identified. **Objective:** To see the presence of known risk factors of CP and co-morbidities in our setting. **Methods:** In this study 100 cases of cerebral palsy attending the child neurology out-patient department Bangabandhu Sheikh Mujib Medical University (BSMMU) were evaluated with special attention to risk factors of CP. Full evaluation was done to find out co-morbidities. **Results:** Birth asphyxia (49%) was the most common risk factor. Mental retardation; speech problem and seizure were common co-morbidities. **Conclusion:** As birth asphyxia is common risk factor of cerebral palsy, it may be reduced by improving perinatal care.

**Key words:** CP, risk factors, morbidities.

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## Introduction:

Cerebral palsy is a diagnostic term used to describe a group of permanent disorders of movement and posture causing activity limitation that are attributed to nonprogressive disturbances in the developing fetal or infant brain. The incidence of cerebral palsy varies between 1–6 per thousand live births<sup>1</sup>. In the recent past this figure is changed with a slight increase trend that coincide with the increased survival rate of infants with very low birth weight.<sup>2</sup> In third world countries like Bangladesh, cerebral palsy (CP) is becoming a major cause of disability. About 32% patient attended in the Child Neurology unit of Bangabandhu Sheikh Mujib Medical University were diagnosed as cerebral palsy.<sup>3</sup> As there is no cure for cerebral palsy, it is necessary to prevent the disease with identifying risk factors. Several studies in developed countries was carried out to identify the risk factors of CP. They found birth asphyxia, preterm, low birth weight, neonatal jaundice, post natal infection were common<sup>4,5</sup>. This study was aimed to observe the frequency of those

known risk factor and co-morbidities of cerebral palsy in this center.

## Methods:

This cross sectional study was done at the out-patient service of Paediatric Neurology, Department of Pediatrics, BSMMU, Dhaka, Bangladesh. Consecutive one hundred children aged 1-10 years suffering from cerebral palsy were selected for this study. Children who were suspected neurodegenerative disease and neurometabolic disorders were excluded. After fulfill initial criteria, detailed history was taken with special attention to antenatal, natal and postnatal risk factors and associated problems. Thorough physical examination, development assessment and neurological examination were done. Cerebral palsy cases were classified using topographical and physiological as well as using gross motor function scale. Psychological assessment was done in all cases by appropriate tools. Ophthalmological and hearing assessment was done in all cases but EEG was done for selected cases. All findings were recorded in structured questionnaire for analysis. Every child was managed with both pharmacological and developmental therapy.

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**Results:**

A total 100 cases of CP were included in this study. Three quarter of the studied cases (74%) were in the 1-5 years age range and male preponderance were found (Table I). Majority of the children came from middle socio-economic status (58%). Eighty per cent of the mother's age was between 21-30 years.

**Table-I**

*Demographic and delivery characteristics of cerebral palsy cases*

Characters	Number
Age below 5 years at presentation	74
Male : female	1.85:1
Maternal age ( 21- 30 yrs)	80
Home delivery	69
Normal Vaginal Delidery	82
Term delivery	82

**Table-II**

*Distribution of known risk factors among cerebral palsy cases*

Risk factors	Number	Percentage
Birth asphyxia	49	49
Prolonged labor	35	35
Preterm	34	34
Low birth weight	17	17
Neonatal jaundice	8	8
Post natal infection	9	9
Consanguinity	4	4
Pre-eclamptic Toxemia	7	7

Birth asphyxia (49%), prolonged second stage of labor (35%), and preterm birth (34%) were found as the top of risk factors (Table II). Low birth weight was not very uncommon (17%). Neonatal jaundice, infection, consanguinity and history of preeclampsia each were in between 4-9%. More than one risk factors were present in some cases.

**Table-III**

*Known Risk factors observed in specific type of cerebral palsy*

Risk factors	Spastic diplegia n=32	Spastic tetraplegia n=30	Spastic hemiplegia n=11	Dyskinetic n=8	Mixed n=9	Others n=10
Birth asphyxia (49)	17(34 %)	19(38.8 %)	3(6.1 %)	3(6.1 %)	2(8 %)	3(6.1 %)
Preterm (34)	19(55.9 %)	9(26.5 %)	3(8.8 %)	0	1(2.9 %)	2(5.9 %)
Low birth weight (17)	7(41 %)	5(29 %)	1(5.9 %)	1 (5.9 %)	0	3(17.64 %)
Neonatal jaundice (8)	0	0	1(12.5 %)	5(62.5%)	1(12.5 %)	1(12.5 %)
Post natal infection (9)	1(11.1 %)	2(22.2 %)	3(33.3 %)	1(11.1 )	2(22.2%)	0
Pre -eclamptic Toxemia (7)	2(28.5 %)	2(28.5 %)	1(14.25 %)	0	1(14.25 %)	1(14.25 %)

Birth asphyxia was found as risk factor in all types of CP with the highest frequency in spastic tetraplegia (38.8%). Preterm birth was found in next higher frequency among risk factors and mostly with spastic diplegia (55.9).

Neonatal hyperbilirubinemia was found in maximum frequency with dyskinetic CP. Birth asphyxia, prolonged labor, preterm & LBW was found in much high frequency spastic diplegia and spastic tetraplegia (Table III).

**Table-IV**  
*Associated Problems in different types of Cerebral Palsy (n=100)*

Name of Associated problems	Spastic Tetraplegia n=30	Spastic Diplegia n=32	Hemiplegia n=11	Dyskinetic n=8	Mixed n=9	Others n=10
Mental retardation (33)	20(60 %)	3(9.9 %)	2(6 %)	3(9.9 %)	2(6 %)	3(9.9 %)
Speech and language delay (26)	15(57.7%)	4(15.4 %)	2(7.7 %)	2(7.7 %)	1(3.85 %)	2(7.7 %)
Seizure (23)	13(56.5 %)	3(13 %)	2(8.7 %)	0	2(8.7%)	3(13%)
Low vision (9)	5(55.6 %)	1(11 %)	0	1 (11 %)	0	2(22.2 %)
Feeding difficulty (7)	1(14.3%)	0	0	5(71.4 %)	1(14.3 %)	0
Hearing impairment (5)	3(60%)	1(20 %)	1(20%)	0	0	0

Important associated problems are shown in different types of CP in Table IV. Mental retardation as the commonest associated problem and mostly were with spastic tetraplegia (60%). Rest were equally distributed in other type. Speech and language delay was commonly associated with spastic tetraplegia (57.7%) but was present in all the varieties of CP in lower frequency. Seizure was also present in all types of CP but was highest in spastic tetraplegia (56.5%). Hearing impairment and feeding difficulty was highest in dyskinetic variety (71.4%). Low vision was commoner in spastic tetraplegia (55.6%). About 50% of spastic tetraplegia had some form of associated problems and many of those cases had more than one problem.

#### **Discussion:**

This study was carried out on 100 children with cerebral palsy. In this study maximum (75%) children were in the 1-5 years age. It is well known that multiple factors play role in development of CP, in most cases more than one factor were present. Usually factors are inter-related, like poor ante natal check up, missed high risk pregnancies and home delivery therefore chance of asphyxia is more. So asphyxia, home delivery, poor antenatal check up may be present in same case in many instances<sup>6</sup>. All of the above factors simultaneously contributed to the highest occurrence (49%) of asphyxia in this study. But scenario in developed countries are different. In their studies birth asphyxia found ranging from 7% to 25%<sup>4-6</sup>. Home deliver-

eries were attended by traditional birth attendant or neighbors who could not predict or manage asphyxia. In the country like Bangladesh more than a half of the deliveries conducted at home<sup>3</sup>, in this study 69% cases were home delivery.

One third (34%) of our cases had history of preterm delivery, this high rate among the etiology may be due to improved NICU care. Though improved NICU care increase survival of extreme LBW babies ultimately developing CP. Similar result was found in an Indian studies, they found LBW in 28% cases<sup>4,7</sup>. Postnatal infection was found another risk factor (9%); in newer antibiotic era more septic babies are surviving but some of them developed different grade cerebral damage may lead to CP. Similar result was found by Suvanand et al<sup>4</sup>. Neonatal jaundice was found in lower frequency and all cases were dyskinetic type cerebral palsy. Consanguinity was least in frequency in our study but few studies found in higher rate<sup>7</sup>; where consanguineous marriage is common.

Mental retardation was found to be the commonest associated disability in this study followed by speech & language delay and epilepsy. Most cases of cerebral palsy had more than one co-morbidities<sup>3</sup>. Vision, hearing, speech all factors can affect cognition, so mental retardation was found top of the list. Seizure was another common association found in this study (23%). As this center deals with neurological as well as developmental disorder, cases associated with seizure was frequently referred for drug therapy. So occurrence of epilepsy as associated problem was over representation than other center (15%)<sup>1</sup>. All the disabilities like, mental retardation (60%), speech and language disorder (57.7%), epilepsy (56.5%), low vision (55.6%) and hearing (60%) were found to be highest in spastic tetraplegia. This finding is consistent with the previous findings as tetraplegia is the most severe form of CP<sup>6, 8-10</sup>. Most of our cases were severely functional disable; probably due to affected population had lack of knowledge about disease and delay

in referral. To detect the role of individual risk factor relation to morbidities a case control study should carried out. Population based study may reflect the actual magnitude of the problem

### Conclusion:

Birth asphyxia was found as common risk factors in this study. Mental retardation, speech problem and seizure were common associate problem. Associated problems were more in spastic tetraplegias. Cerebral palsy may be reduced by preventing birth asphyxia.

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