

Original Research Article

Comorbidities associated with cerebral palsy in children presenting at department of Pediatrics, K. T. children hospital Rajkot, India

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ABSTRACT

Background: Cerebral palsy is a diagnostic term used to describe a group of motor syndromes resulting from disorder of early brain development. It describes a group of permanent disorders of the development of brain and posture causing activity limitation. The magnitude of cerebral palsy in our country is 2 to 2.5 per thousand live birth. The objective is to study co-morbidities associated in cerebral palsy patients.

Methods: It was a hospital based cross sectional study carried out in KT Children Hospital, PDU Medical College, Rajkot for 1 year (April 2017-April 2018). Sample size: minimum 100 cases. Selection of subject: All the children suffering from cerebral palsy presenting at KT Children hospital, P.D.U. Medical college Rajkot, Gujarat. Cases were evaluated by history, clinical examination and necessary investigations.

Results: From data collected in present study most common variety of Cerebral Palsy is spastic type (72.5%) followed by, dyskinetic (16%), ataxic (7%), and hypotonic (4.5%) type. Within spastic type; diplegic (48%) is the most common variety. Caesarean section delivered cases are more predisposed to Cerebral palsy in present study which might be due to other risk factors associated with it. Gender and consanguinity showed not major significance in association with CP child. Most of Cerebral palsy cases in present study were born full term (81.5%) and of normal birth weight (78.5%). The most common comorbidities in present study were cognitive impairment (77%) followed by epilepsy (38%), visual impairment (10%), hearing disability (9%) thyroid dysfunction (3%) and G.I. disturbances (2%). Perinatal asphyxia is the most common history finding in Cerebral palsy cases including in present study, followed by seizures during infancy, pathological jaundice, neonatal sepsis and history of NICU admission for any cause.

Conclusions: Cerebral palsy in developing countries has a higher prevalence and different clinical profile regarding severity and associated disability. The perinatal and high-quality neonatal care together with physical therapy and rehabilitation programs have a significant role in preventing comorbidities in cerebral palsy cases, which is still lacking in developing countries.

Keywords: Ataxic, Cerebral palsy, Cognitive impairment, Comorbidity, Diplegic, Hypotonic, NICU care, Perinatal asphyxia, Spasticity

INTRODUCTION

Cerebral Palsy is a term that has been formally defined as a group of permanent disorders of the development of movement and posture, causing activity limitation, which is attributed to non-progressive disturbances that occurred

in the developing fetal or infant brain.¹ The motor disorders are often accompanied by disturbances of sensation, perception, cognition, communication, behavior, epilepsy or any other secondary musculoskeletal problems. Prevalence estimates range from 2-2.5/1,000 live births. A number of factors

contribute to the development of Cerebral palsy including antenatal, natal, and postnatal factors.

Perinatal asphyxia also play role for the development of Cerebral palsy which have more contribution in developing countries. Prematurity as survival of preterm babies is increasing owing to better health facilities. Maternal malnutrition, infections, and anemia are some of the preventable factors.

Common associated co morbidities are epilepsy, speech, hearing and vision impairment, oromotor dysfunction and intellectual disability.

This study aims at identifying the comorbidities of Cerebral palsy cases.

METHODS

All the children suffering from cerebral palsy presenting at K T Children hospital, P.D.U. Medical college Rajkot, Gujarat April 2017-April 2018.

It was a hospital based cross sectional study carried out at Department of Pediatrics KT Children Hospital, PDU Medical College, Rajkot for 1 year (April 2017-April 2018). No. of subjects: 102.

Inclusion criteria

- All the children suffering from cerebral palsy presenting at K T Children hospital, P.D.U. Medical college Rajkot, Gujarat April 2017-April 2018.

Institutional Ethical Committee permission was taken before initiating the study.

After taking informed written consent from the parent/guardian, all children fulfilling inclusion criteria were enrolled and detail history with clinical examination were recorded in a pre-designed and pre-evaluated performa.

The relevant laboratory and/or radiological investigations were carried out.

A clinical evaluationn carried out including detailed history and clinical examination at the time of presentation and were classified according to the physiological classification into spastic (increased tone), dyskinetic (extra pyramidal signs and symptoms), ataxic (disturbed gait), hypotonic (decreased tone) and mixed types on the basis of major motor abnormality.

In the next step patients were classified according to topographical classification into monoplegia (one limb involvement), diplegia (4 limb involved, Lower limb> Upper Limb), triplegia (3 limbs involved), quadriplegia (4 limbs involved), paraplegia (both lower limbs involved) and hemiplegia (upper and lower limb of one side).

Thorough neurological examination was done to find out associated comorbidities.

Associated impairments have been documented by reviewing available formal documents including the history of true recurrent seizures, cognitive assessment, visual acuity, and hearing evaluation.

OPD based evaluation done for Ophthalmic and Ent impairment. For hearing impairment, an official audiometry result was reviewed.

Data was analysed using SPSS software.

RESULTS

Present study composed of 102 cases, male female ratio 1.1:1, from urban (19%) and from rural (81%). In present study (48%) cerebral palsy cases from consanguineous married couple and (52%) from non consanguineous married couple.

Mode of delivery observed in our study caesarean section (63%) and vaginal delivery (37%) Birth weight and gestational age associated in our study (78.5%) normal birth weight and (81.5%) full term children.

Most common cerebral palsy is spastic variety (72.5%) and in spastic diplegic (48%) is most common type. Perinatal asphyxia is most common natal risk factor (42%) followed by seizure (33%), sepsis (14%) jaundice (4%).

Most common associated comorbidities in present study were cognitive impairment (77%) followed by epilepsy (38%), visual impairment (10%), hearing disability (9%), Thyroid dysfunction (3%), and G.I. disturbance (2%).²

Table 1: Associated comorbidities.

Disorder	Number (%)
Cognitive impairment	78 (77)
Epilepsy	39 (38)
Visual impairment	11 (10)
Hearing impairment	10 (9)
Thyroid dysfunction	3 (3)
G.I. disturbances	2 (2)

Table 2 shows that gender and consanguinity showed no major significance in association with cerebral palsy child.³

Most of cerebral palsy cases in present study were born full term 83 (81.5%) and of normal birth weight 80 (78.5%).

Caesarean section delivered cases are more predisposed to cerebral palsy in present study which might be due to other risk factors associated with it.

Table 2: The demographic data of the cases (number=102).

Variable		Number	%
Gender	Male	56	55
	Female	46	45
Residence	Rural	82	81
	Urban	20	19
Parents consanguinity	Positive	49	48
	Negative	53	52
Type of delivery	Normal	38	37
	Cesarean	64	63
Gestational age	Pre-term	19	18.5
	Full term	83	81.5
Birth weight	Extremely LBW	4	3.5
	Very LBW	5	5
	Low birth weight	13	13
	Normal birth weight	80	78.5
Age	6 months -2 year	39	38
	2 year-4 year	31	30
	4 year-6 year	17	17
	6 year-12 year	15	15

From data collected in present study most common variety of cerebral palsy is spastic type (72.5%) followed by, dyskinetic (16%), ataxic (7%), and hypotonic (4.5%) type.⁴⁻⁸

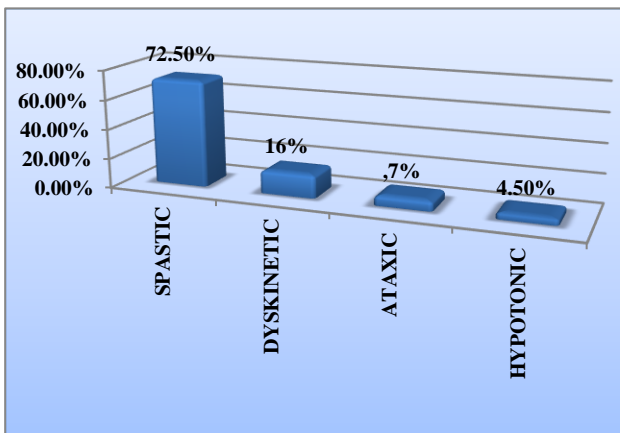


Figure 1: Types of cerebral palsy.

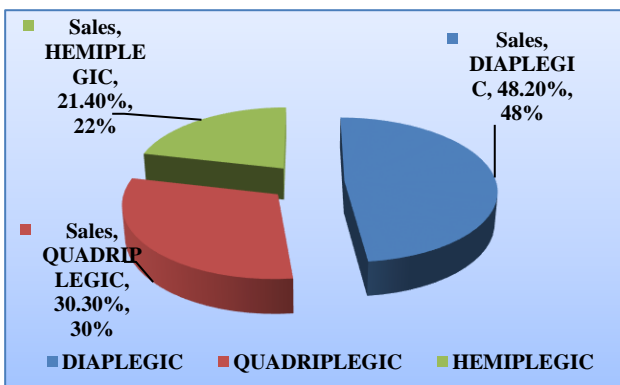


Figure 2: Distribution of spasticity.

Spastic cases have been further categorized according to the distribution of spasticity to diplegic 36(48%), quadriplegic 22 (30%), and hemiplegic 16 (22%).⁹ Within spastic type; diplegic 36 (48%) is the most common variety.¹⁰

Table 3: Natal risk factor association with cerebral palsy.

Risk factor	Frequency
Perinatal asphyxia	42 (41%)
Seizures	33 (32.2%)
Pathological jaundice	4 (4%)
Neonatal sepsis	14 (14%)
Unknown	9 (8.8%)

Perinatal asphyxia is the most common history finding in Cerebral palsy cases including in present study, followed by seizures during infancy, pathological jaundice, neonatal sepsis and history of NICU admission for any reason.¹¹⁻¹³

DISCUSSION

Study O'Callaghan ME et al, also shows that cognitive impairment is most common associated co morbidities.³

It has been found that both cognitive impairment and epilepsy were found in a higher percentage. Out of this 34 (33.3 %) has multiple comorbidities.

Studies of clinical spectrum comorbidities by Minocha P et al, also shows spastic as the most common variety.⁸

Study by Graham et al, also shows diplegic is most common sub type in spasticity.¹

Table 2 explains demographic distribution of present study group. Present study composed of 102 cases, male female ratio 1.1:1, from urban (19%) and from rural (81%).

In present study (48%) cerebral palsy cases from consanguineous married couple and (52%) from non consanguineous married couple.

Mode of delivery observed in present study caesarean section (63%) and vaginal delivery (37%). Birth weight and gestational age associated in present study (78.5%) normal birth weight and (81.5%) full term children.

CONCLUSION

Cerebral palsy in developing countries has a higher prevalence and different clinical profile regarding severity and associated disability. The perinatal and high-quality neonatal care together with physical therapy and rehabilitation programs have a significant role in

preventing comorbidities in cerebral palsy cases, which is still lacking in developing countries.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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