Journal of Advances in Medicine and Medical Research

34(5): 90-96, 2022; Article no.JAMMR.83898
ISSN: 2456-8899
(Past name: British Journal of Medicine and Medical Research, Past ISSN: 2231-0614, NLM ID: 101570965)

Cerebral Palsy among Children Seen in University of Port Harcourt Teaching Hospital: Aetiologies and Comorbidities

N. Gabriel-Job[1*], A. I. Frank-Briggs[1] and S. Douglas[2]

[1]Department of Paediatrics, University of Port Harcourt Teaching Hospital, Rivers State, Nigeria.
[2]Department of Paediatrics, Faculty of Clinical Sciences, Rivers State University, Nigeria.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JAMMR/2022/v34i531304

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/83898

Original Research Article

Received 03 January 2022
Accepted 12 March 2022
Published 30 March 2022

ABSTRACT

Introduction: Cerebral palsy (CP) is a common neurologic disorder, particularly in the developing countries where the aetiological factors are preventable. The aim of this study is to determine the pattern of Cerebral palsy among children in Port Harcourt.
Methods: A one year retrospective descriptive study of patients seen in the Paediatrics Neurology clinic with a diagnosis of Cerebral palsy was done. Demographics, medical history, examination and investigation findings were obtained from the Patients' medical records.
Results: A total of 111 children with CP were seen in the clinic from 2020 – 2021. There were 75 (67.6%) males and 36 (32.4%) females giving a male to female ratio of 2:1. Their ages ranged from 6 months to 12 years with a mean age of 3.4 ± 1.9 years at presentation. Birth asphyxia 56(50.1%), bilirubin encephalopathy 22(19.8%) and neonatal infections 8 (7.2%) were the leading cause of CP. The commonest subtype of CP was spastic quadriplegia in 68 (61.3%) of them. Microcephaly (26.7%), seizure disorder (24%) and speech impairment (16.0%) were the commonest observed comorbidities.
Conclusion: CP is still prevalent in Port Harcourt. Preventable causes remain the leading culprit. Modalities to prevent birth asphyxia and bilirubin encephalopathy in our community will reduce the incidence of CP.

**Corresponding author: E-mail: ngabrieljob2014@gmail.com;*

Keywords: Cerebral palsy; aetiologies; comorbidity.

1. INTRODUCTION

Cerebral palsy (CP) is a disorder characterized by abnormal posture, tone and movement which is permanent but not unchanging caused by a non-progressive lesion, abnormality or interference of the immature or developing brain [1-3].

Cerebral palsy is aetiologically and clinically extremely heterogeneous, making a diagnosis of CP is mainly clinical and this is based on motor functions as well as the posture disorders observed during early childhood which persist throughout life. These disorders are non-progressive, but tend to change as the child grows older [1,4].

Although, motor function disorder is the main symptom observed in patients with CP, it is often accompanied by other co-morbidities such as speech / language, cognitive and behavioural problems, childhood epilepsy and others [1,4].

The aetiology of CP is multifaceted, recent epidemiological studies in developed countries have given a better view of the risk factors of CP. The finding of these studies shows that prenatal , neonatal and childhood aetiologies may account for majority of new cases of CP, differing from previous belief that perinatal pathology is the most important aetiology [1,5,6]. This finding is in contrast with findings from developing countries were perinatal risk factors are the main aetiologies of CP [7,8].

Changes in the epidemiology of CP have been reported over the years in developed countries with the advancements in perinatology there is a rise in survival of premature babies and hence, a change in the distribution of the clinical types. The incidence of CP ranges between 1.5 and 3.0 per 1000 live births; this incidence varies based on the risk factors and the groups of patients involved. For instance an European study reported a higher incidence among babies born with low birth weight [6].

In the developing countries, prevalence of CP has been estimated to be 1.5–5.6 cases per 1000 live births.[9] In Nigeria, the prevalence rates varies ranging from 30.0% - 40.0%, however, preventable causes like severe perinatal asphyxia, bilirubin encephalopathy, central nervous system infection, and prematurity are the common aetiological factors [7,8,9]. Several factor have been reported as a risk factor to CP including low socioeconomic class, sex of the patient and others [7,8,9]. Co-morbidities affect the health and quality of life of these children by determining their participation in most aspects of life including schooling [10].

The study was aimed to determine the magnitude of cerebral palsy, the types, the aetiological factors as well as the co-morbidities among children with cerebral palsy in Port Harcourt.

2. METHODOLOGY

A retrospective descriptive study was carried out between September 2021- November 2021. Hospital records of children with CP who attended paediatrics neurology clinic between August 2020- July 2021 were studied.

A total of 421 patients who were seen in the university of Port Harcourt Teaching Hospital paediatrics neurology clinic within the stated period were identified from the clinic register. The folder numbers of those who had CP were obtained and the folders retrieved from the record department. The following information were extracted from the case notes- socio-demographic variables, age at first presentation, clinical history, examination findings, diagnosis, types of cerebral palsy and the associated co morbidities they had. The extracted data were entered in a data entry form which was cross checked and observed mistakes were corrected before data was entered and analysed using SPSS version 25 statistical software. Results were expressed in proportions, percentages in frequency tables and graphs. Chi square test was conducted to compare different subgroups. Confidence interval was set at 95% and a p-value of ≤ 0.05 was considered as significant.

3. RESULTS

Of the 421 patients seen at the Paediatric neurology unit of the hospital during the study period, 111(26.4%) had cerebral palsy. Ages ranged from 6 months to 12 years, with a mean age of 3.4±1.9 years at presentation. Of the 111 CP cases 75(67.6%) were males while 36(32.4%) were females giving a male to female ratio of 2:1. Eighty nine (80.2%) of them were delivered at term while 22 (19.8%) were preterm.

Ninety eight (88.3%) weighed ≥ 2.5kg at birth while 13(11.7%) weighed less. Sixty eight (61.3%) of the patients mothers attended antenatal care, 91(82.0%) had prolonged labour. Mode of delivery: 94(84.7%) by vaginal delivery, 4 (3.6%) assisted mode of delivery while 13(11.7%) of them had caesarean section. Majority of the mothers 95(85.6%) had only primary/secondary level of education. Place of delivery: Maternity 36(32.4%), Hospitals 34(30.6%), home 30 (27.0%), TBA 4 (3.6%), church 2(1.8%), 5(4.5%) not identified. The various complications reported by the mothers during pregnancy and deliveries as presented in Table 1.

Common cause of cerebral palsy identified includes birth asphyxia 56 (50.5%) and bilirubin encephalopathy 22 (19.8%) Table 2.

Fig. 1 showed the different types of CP seen, the commonest was spastic CP, with spastic quadriplegia 68(61.3%) accounting for the commonest sub-type, while hypotonic and Ataxic type were not identified in this study.

Comorbidities identified includes Microcephaly 29 (26.1%), Seizure disorders 27 (24.3%), speech impairment 18 (16.2%). While 5 (4.5 %) of the patients didn't have any comorbidity (Table 3).

Table 4 showed the relationship between the two common aetiologies of CP found in this study and the two co-morbidities. Children who had CP from birth asphyxia were significantly more likely to develop seizure disorder and microcephaly compared to those who had bilirubin encephalopathy.

4. DISCUSSION

The prevalence of CP of 26.4% recorded in this study is lower than finding from a previous study from Port Harcourt,[8] this may be due to the presence of another tertiary hospital as well as other private paediatric hospitals in the state that also take care of similar cases.

Of the 111 participants in this present study, 67.6% of them were males giving a male to female ratio of 2:1. This collaborates with findings from previous studies, where it was reported that male sex was a risk factor for CP and unfavourable neurologic outcomes following cerebral palsy [11,12,13]. This high male preponderance in this study could be due to the gender discrepancy in seeking medical care among care givers and parents, where the male child is given more attention even during illness due to son preference.

Majority of the patients in our study were born at term and had birth weights greater than 2.5kg, this finding is at variance with a previous study that reported prematurity as a major cause of CP [1,6]. This may be due to improved survival rates of premature and extreme low birth weight babies in developed countries compared to developing countries such as ours.

The mean age at presentation of 3.4± 1.9 years shows that these patients presented late to the hospital. This finding is similar to previous studies. This late presentation may be due to the belief that the problem may be spiritually related and caregivers and parents may seek help from unorthodox places first before presenting in the hospital [8].

Receiving antenatal care from professionals is essential to decrease the risk of morbidity and mortality to both the mother and child throughout pregnancy, delivery and during the neonatal period [14]. This present study shows that ANC attendance in pregnancy is poor and that women still deliver at home and in maternities manned by unqualified personnel's. This finding is comparable with finding from Ejeliogu et al [14] and NDHS [15]. This may be due to poverty as most of these mothers may not afford antenatal care from standard facilities. Hence, babies delivered at home or by unskilled attendant outside a hospital facility were unlikely to have been resuscitated if they had perinatal asphyxia.

The common causes of CP in our study were birth asphyxia and kernicterus. This is similar to previous finding from a developing country, where preventable causes of CP were more prevalent [16].

Though most of the children in our study were born through vaginal delivery; however, most had prolonged labour, which may have lead to the high rate of birth asphyxia reported as a cause of CP in this study. This agrees with a study from a developing country where birth asphyxia was reported as a significant cause of CP [16]. It could be that these women may have patronized unskilled personnels like traditional birth attendants and maternity homes due to their traditional believes, a practice that is predominant among women in developing countries [17].

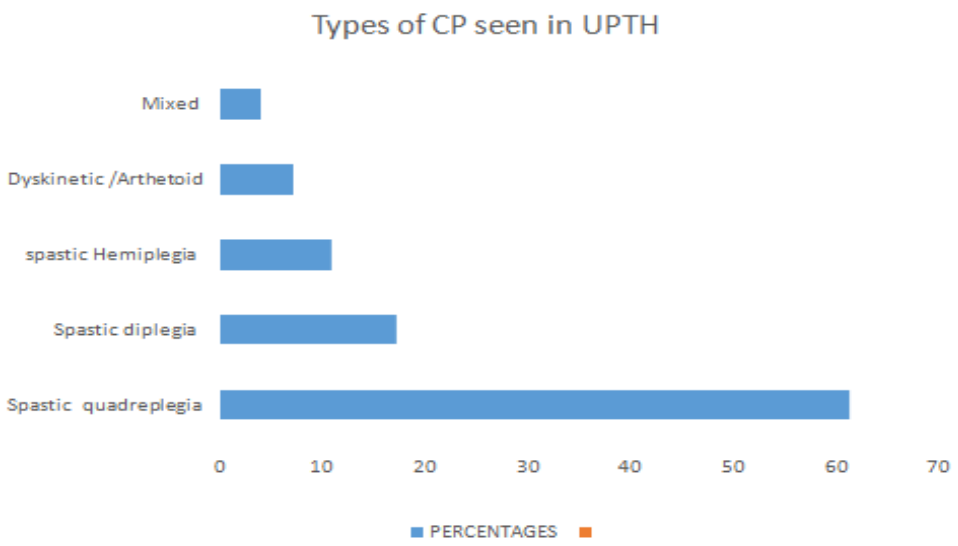

Fig. 1. Types of CP seen in UPTH

Table 1. Demographic variables/ pregnancy and birth history

Variables	Frequency	Percentages
Sex		
Males	75	67.6
Females	36	32.4
		Male: female ratio 2:1
Ages (years)		
< 1 year	6	5.4
1-5	54	48.6
6-10	43	38.7
>10	8	7.2
		Mean age 3.4±1.9 years at presentation.
Gestational age at birth		
Term	89	80.2
Preterm	22	19.8
Birth weight (Kg)		
≥2.5	98	88.3
<2.5	13	11.7
Antenatal care		
Yes	68	61.3
No	43	38.7
Antenatal complications		
Hypertension/PIH	75	67.6
Fever	19	17.1
Preeclampsia /eclampsia	8	7.2
Antepartum haemorrhage	7	6.3
Twin gestation	2	1.8
Complication during delivery		
Prolonged labour	91	82.0
Delayed second stage	8	7.2
Haemorrhage	5	4.5
Malpresentation/malposition	4	3.6
Instrumental delivery	2	1.8
precipitate labour	1	0.9

Variables	Frequency	Percentages
Place of delivery		
Maternity	36	32.4
Hospital	34	30.6
Home	30	27.0
TBA	4	3.6
Church	2	1.8
Not identified	5	4.5
Total	111	100.0

Table 2. Causes of CP among the 111 patients

Causes	Frequency	Percentages
Birth asphyxia	56	50.5
Neonatal jaundice	22	19.8
Neonatal infection	8	7.2
Multiple	8	7.2
Prematurity	6	5.4
Unknown	6	5.4
Post neonatal meningitis	4	3.6
Meconium Aspiration syndrome	1	0.9
Total	111	100.0

Table 3. Associated co-morbidities in cerebral palsy

Comorbidities	Frequency	Percentages
Microcephaly	29	26.1
Seizure disorder	27	24.3
Speech impairment	18	16.2
Motor delays	10	9.0
Feeding difficulty	8	7.2
Intellectual disabilities	6	5.4
None	5	4.5
Visual impairment	4	3.6
Hearing disorder	3	2.7
Acquired Talipes	1	0.9
Total	111	100.0

Table 4. Relationship between the two common aetiologies of CP and two common comorbidities identified among the patients

Aetiology	Microcephaly		p-value	OR	95% CI
	Yes	**No**			
Birth Asphyxia	26 (46.4)	30 (53.6)	0.01	5.49	1.45-20.67
Bilirubin encephalopathy	3 (13.6)	19(86.4)			
Total	29(37.2)	49 (62.8)			
	Seizure Disorder		0.05	3.13	0.94-10.49
Birth Asphyxia	23(41.1)	33(58.9)			
Bilirubin encephalopathy	4 (18.2)	18(81.8)			
Total	**27(36.6)**	**51(65.4)**			

The preponderance of Spastic CP cases in our study and spastic quadriplegia as the commonest subtype is similar to that reported by two previous studies [16,18].

It is not surprising to find children with CP having other disorders, neurological comorbidities such as those found in this study have been reported by others [8]. The dominance of microcephaly and seizure disorder as the commonest neurological comorbidities in this present study differs from reports by others were intellectual disabilities and visual impairment were reported as the most common neurological co-morbidities among comparable group of children [11,19,20]

the finding of this study however is similar to finding in Sagamu, Nigeria [18].

Birth Asphyxia was significantly associated with seizure disorder and microcephaly, a finding which agrees with Ogunlesi et al, [18] and Bhati et al, [20]. This could be as a result of more extensive brain damage following perinatal asphyxia.

5. CONCLUSION

Prevalence of CP of 26.4% in our study is high with preventable causes like birth asphyxia and kernicterus still common in our setting. Spastic CP cases are predominant with microcephaly and seizure disorder as common neurologic co morbidities. Preventing perinatal asphyxia, recognizing and prompt treatment of neonatal jaundice is essential to reduce CP.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Sadowska M, Sarecka-Hujar B, Kopyta I. Cerebral palsy: current opinions on definition, epidemiology, risk factors, classification and treatment options. Neuropsychiatr Dis Treat. 2020;16:1505-1518.
   Published 2020 Jun 12.
   DOI:10.2147/NDT.S235165
2. Patel DR, Neelakantan M, Pandher K, Merrick J. Cerebral palsy in children: A clinical overview. Transl Pediatr. 2020;9:125-135.
   DOI:10.21037/tp.2020.01.01
3. Colver A, Fairhurst C, Pharoah PO. Cerebral palsy. Lancet.2014;383:1240-9.
   DIO:10.1016/S0140-6736(13)61835-8
4. Cans C, Dolk H, Platt MJ, Colver A, Prasauskiene A, Krageloh-Mann I; SCPE Collaborative group. Recommendations from the SCPE collaborative group for defining and classifying cerebral palsy. Dev Med Child Neurol Supp. 2007;109:35–38.
   DOI:10.1111/j.1469-8749.2007
5. Reddihough D, Collins KJ. The epidemiology and causes of cerebral palsy. Aust J Physiother. 2003;49(1):7–12.
   DOI:10.1016/S0004-9514(14)60183-5
6. Surveillance of Cerebral Palsy in Europe. Surveillance of cerebral palsy in Europe: A collaboration of cerebral palsy surveys and registers. Dev Med Child Neurol. 2000; 42:816–824.
   DOI:10.1017/ S0012162200001511
7. Belonwu, R & Gwarzo, Garba Dayyabu & Adeleke, S. Cerebral palsy in Kano, Nigerian - A review. Nigerian Journal of Medicine: Journal of the National Association of Resident Doctors of Nigeria. 2009;18:186-9.
8. Frank-Briggs AI, Alikor EAD. Sociocultural issues and causes of cerebral palsy in Port Harcourt, Nigeria. Nigerian Journal of Paediatrics. 2011;38(3):115-119.
9. Agarwal A, Verma I. Cerebral palsy in children: An overview. J Clin Orthop Trauma. 2012;3(2):77-81.
   DOI:10.1016/j.jcot.2012.09.001
10. Duke RE, Torty C, Okorie U, et al. Pattern of comorbidities in school-aged children with cerebral palsy in Cross River State, Nigeria. BMC Pediatr. 2021;21:165.
    Available:https://doi.org/10.1186/s12887-021-02637-9
11. Odding E, Roebroeck ME, Stam HJ. The epidemiology of cerebral palsy: incidence, impairments and risk factors. Disabil Rehabil. 2006;284:183-191.
12. Stanley E, Blair E, Alberman E. Cerebral palsies: epidemiology and causal pathways. London, United Kingdom: Mac Keith Press. How common are the cerebral palsies?. 2000;22–39
13. Hintz SR, Kendrick DE, Vohr BR, Kenneth Poole W, Higgins RD Nichd Neonatal Research Network. Gender differences in neurodevelopmental outcomes among extremely preterm, extremely-low-birthweight infants. Acta Paediatr. 2006; 95:1239–48
14. National Population Commission (NPC) [Nigeria] and ICF. Nigeria Demographic and Health Survey 2018 Key Indicators Report. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF; 2019.

Retieved on 6th of February 2022 from https://www.dhsprogram.com › pubs › pdf

15. Ejeliogu EU, Ebonyi AO, John C, Yiltok ES, Toma BO. An evaluation of risk factors for cerebral palsy in children in Jos, Nigeria. BJMMR. 2017;21(4): 1-13
16. Singhi Pratibha D, Ray Munni, Suri Gunmala. Clinical spectrum of cerebral palsy in North India- an analysis of 1000 cases. Tropical Journal of Pediatrics. 2002;48(3):162-6.
17. John EA, Esienumoh EE, Nsemo AD, Yagba J. Traditional Reproductive Health Practices among Women in South- South Nigeria. Nur Primary Care. 2017;1(2):1-6.
18. Ogunseli T, Ogundeyi M, Ogunfowora O, Olowu A. Socio-clinical issues in cerebral palsy in Sagamu, Nigeria. South Afr J Child Health. 2008;2(3):120–4.
19. Nottidge VA, Okogbo ME. Cerebral palsy in Ibadan, Nigeria. Dev Med Child Neurol 1991; 33: 241-245.
20. Bhati P, Sharma S, Jain R, Rath B, Beri S, Gupta VK, Aneja S. Cerebral Palsy in North Indian Children: Clinico-etiological Profile and Comorbidities. J Pediatr Neurosci. 2019;14(1):30-35.
DOI: 10.4103/jpn.JPN_46_18
PMID: 31316640
PMCID: PMC6601115

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/83898