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## Sociocultural issues and causes of cerebral palsy in Port Harcourt, Nigeria

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**Abstract Background.** Cerebral palsy (CP) is a common neurological disorder of childhood with significant neurological complications and associated comorbidities.

The aim of this study was to determine the socio-cultural characteristics and causes of CP in children who presented to the Paediatric neurology clinic in Port Harcourt, Nigeria.

**Method:** Hospital records of 834 children with CP who presented between 1<sup>st</sup> June 2008 and 1<sup>st</sup> June 2010 were reviewed. Demographic data were extracted and a validated socio-economic classification of parents was used. Data was analyzed using SPSS version 15 software.

**Results:** of the 2,288 patients with neurological disorders seen, 834 had cerebral palsy giving a prevalence of 36.45%. Their ages ranged from 5 months to 13 years. Socio-economic stratification of the patients showed concentration in the lower socioeconomic groups IV (35.73%) and V (56.35%).

Majority of the children 668 (80.09%) had spastic CP. Eighty seven (10.43%) had hypotonic and 57 (6.83%) extrapyramidal types, the mixed type 22 (2.64%) was the least common. Asphyxia (27.94%), kernicterus (26.26%) and Central Nerves System infections (15.95%) were the leading identified causes. Co-morbidities such as seizures, microcephaly and speech and auditory deficits were present in majority of the subjects. Seizures and microcephaly were commoner among CP cases associated with asphyxia than those associated with kernicterus.

**Conclusion:** Cerebral palsy was commoner amongst those in low socio-economic status with perinatal problems. Improved perinatal care will reduce the burden of CP. Continuing training of health workers and traditional birth attendants are essential.

**Keywords:** Cerebral palsy, Social cultural issues, Port Harcourt.

### Introduction

Cerebral palsy (CP) is a chronic disabling condition resulting from permanent damage to the immature brain. It is commonly encountered worldwide.<sup>1-3</sup> In the industrialized world the incidence of cerebral palsy is about 2 per 1000 live births.<sup>3</sup> The incidence is higher in males than in females 1.3:1. It is caused by damage to the cerebral cortex and other parts of the brain such as the cerebellum. The damage affects the developing brain which can occur during

pregnancy, during childbirth or after birth up to about age three.<sup>4</sup> This results in limitation in movement and posture and are often accompanied by disturbances of sensation, depth perception and other sight-based perceptual problems, speech disorders, and sometimes even cognitive impairment; CP may be accompanied by epilepsy. While in certain cases there is no identifiable cause, typical causes include problems in intrauterine development (e.g. infections, exposure to radiation), birth asphyxia, birth trauma, severe jaundice, meningitis and encephalitis during early childhood.<sup>5</sup>

The consequences of CP include retardation of growth and delay in motor development as well as cognitive and social problems. For many children with CP, parents are heavily involved in their self-care activities. Self-care activities, such as bathing, dressing, grooming and eating, can be difficult for these children as self-care depends primarily on use of the upper limbs.<sup>6,7</sup> For those living with CP, impaired upper limb function affects almost 50% of children and is considered the main factor contributing to decreased activity and participation in daily activities.<sup>7</sup> Since the hands are used for many self-care tasks, it is logical that sensory and motor impairments would impact negatively on daily self-care activities.<sup>8</sup>

The ideal management of CP is comprehensive and effective physical rehabilitation,<sup>7</sup> which is unfortunately expensive. However, even with the best rehabilitation, functional and physical recovery in CP is rarely complete. Prevention therefore is of central importance. This study was conducted to determine the socio-cultural issues and probable causes of CP in children presenting to a tertiary hospital in Nigeria. These may help in identifying factors that need further study in order to reduce the burden of CP in the country.

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## Materials and Method

The study was a retrospective survey of medical records of children who were seen in the Paediatric Neurology unit of the University of Port-Harcourt Teaching Hospital, Nigeria from June 2008 to June 2010. Port Harcourt is the capital of Rivers State with a population of about 5 million. The teaching hospital is the only tertiary hospital located in the Port Harcourt metropolis. It is a 500 bedded hospital and serves as a referral centre for hospitals within the state and neighboring states.

Data on age, gender, clinical history and examination findings, diagnosis and treatment outcome were collected from their case records. It was noted that children who had other neurological disorders had multidisciplinary evaluation of their problems. They were co managed with other specialists like the ophthalmologists, audiologists, physiotherapists and clinical psychologists. The case notes of the patients were coded for easy identification in order to ensure that duplication did not occur in recruiting the patients into the study.

A colored marker was used to inscribe a mark as soon as the folder was used. Diagnosis of cerebral

Palsy Was based on clinical evaluation but investigations carried out for some of the patients included skull and spine radiographs, transfontanel ultrasound scan, computerised tomography scan and or magnetic resonance imaging studies.

These tests were carried out for individual patients as needed, especially for those whose diagnosis was difficult to ascertain clinically. Parental socio-economic classification into the upper (I, II), middle (III) and lower (IV and V) groups was done using the method recommended by Oyedeji.<sup>9</sup> Data was analyzed using SPSS version 15 software and presented in frequency distribution tables and percentages.

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## Results

### *General characteristics*

A total of 2,288 patients with neurological disorders were seen in the Paediatric neurology unit of the hospital during the study period. Of these, 834 had cerebral palsy.

The prevalence of CP at the Paediatric Neurology Clinic for the study period was 36.45%. Their ages ranged from 5 months to 13 years.

(Table 1) There were 536(64.27%) males and 298(35.73%) females giving a male to female ratio of 1.8: 1. Socio-economic stratification of the patients showed concentration in the lower socioeconomic groups IV (35.73%) and V (56.35%), the others are shown on Table 2.

### *Mode and Places of delivery of the children with CP.*

Most 534(64.03%) of the children were delivered by spontaneous vertex delivery. Two hundred and eighty six (34.29%) were by assisted mode of delivery while 14(1.68%) of them had caesarean section. Majority of the children were delivered at home 310 (37.17%). Only 24 children (2.88%) were delivered in the University of Port Harcourt teaching hospital. The group of children belonging to others included those who were delivered in a motor vehicle on their way to the place intended for delivery 7(0.84%) and in the farm 4(0.48%). Table 3

### *Clinical classification of Cerebral Palsy*

Majority of the children 668 (80.09%) had spastic CP. Eighty seven (10.43%) had hypotonic and 57 (6.83%) extrapyramidal types, the mixed type 22 (2.64%) was the least common. Of the 668 children with spastic CP, 458(68.56%), 285 (42.67%) and 91 (13.62%) were quadriplegic, hemiplegic and diplegic, respectively.

### Aetiological factors

Table 4 shows various aetiological factors that contributed to cerebral palsy amongst the study group. Birth asphyxia accounted for about 28% of cases, closely followed by kernicterus in 26 %. The others are shown on the table. In 466 (55.87%) of the children only one cause was identified, 87(10.43%) had multiple causes, and 281(33.69% ) had no identifiable cause. The perinatal causes included asphyxia, kernicterus and prematurity, while central nervous system (CNS) infections and head injuries were the major post-natal causes.

### Neurological co-morbidities

The majority of children (84.65%) had CP with various comorbidities; some of the children had more than one disorder. Seizures, microcephaly and speech impairment were the commonest comorbidities, affecting 418 (50.12%), 308 (36.93%) and 240 (28.78%) children, respectively. Table 5 shows these comorbidities. One hundred and twenty eight (15.35%) had no comorbidities.

**Table 1.** Age distribution of the children with cerebral palsy at presentation

Age	No	%
<1 year	261	31.29
1 - 3 years	428	51.32
4 - 6 years	98	11.75
7 - 9 years	26	3.12
=10 years	21	2.52
Total	834	100.0

**Table 2:** Socio-economic classification of the children with cerebral palsy

Socio-economic group	No	%
I (upper)	7	0.84
II (upper)	18	2.16
III (middle)	41	4.92
IV (lower)	298	35.73
V (lower)	470	56.35
Total	834	100.0

**Table 3:** showing place of delivery of the children with cerebral palsy

Place of Delivery	No	%
Home	310	37.17
Local maternity home	212	25.42
Church	109	13.07
Primary health center	98	11.75
General hospital	52	6.25
Tertiary hospital	24	2.88
Privately owned hospital	18	2.16
Others	11	1.32

**Table 4:** Causes of cerebral palsy among the 834 children

Causes	No	%
Asphyxia	233	27.94
Kernicterus	219	26.26
CNS infections*	133	15.95
Prematurity-associated complications	64	7.67
Neonatal seizures	23	2.76
Head injury	11	1.32
Unknown	151	18.11
Total	834	100

KEY: \*CNS infections = central nervous system infections (meningitis and encephalitis).

**Table 5:** Co-morbidities among the children with Cerebral Palsy

Co-morbidities	No	%
Seizures	418	50.12
Microcephaly	308	36.93
Speech impairment	240	28.78
Mental retardation	211	25.30
Visual deficits	188	22.54
Hearing impairment	102	12.23
Behavioural disorder	31	3.72
Hydrocephalus	10	1.20
None	128	15.35

### Discussion

This study recorded a higher prevalence of CP than the 16%<sup>4</sup> and 16.2%<sup>6</sup> previously reported from other centers in Nigeria. This may be due to increasing awareness that CP can be managed in hospital setting, making more parents and caregivers come with their children to seek medical attention instead of seeking help in the homes of traditional healers and other unorthodox places. The number of unsupervised

deliveries resulting in significant cerebral damage may have contributed to this high number as well. In the developed nations of the world CP is also on the increase due to improved intensive care and better management of very low birth weight and severely premature babies. These babies survive but come down with neurological sequelae including different types of cerebral palsy.<sup>4,5,10</sup>

The age distribution of the children showed that about half (51.32%) of them were between 1-3 years old. This late presentation is not strange. When a child has delayed motor milestone and other comorbid problems such as seizures, it is usually attributed to evil spirit possession and witchcraft, therefore orthodox medication and therapy is the last option. Parents and caregivers usually seek solution elsewhere such as spiritual homes, native doctors and traditional healers before presenting to the hospital.<sup>11</sup>

Majority of the parents were in the lower socio-economic groups. This finding is consistent with previous association of CP with poor education and poverty.<sup>5</sup> These factors in combination with ignorance result in poor utilization of antenatal and proper delivery services.<sup>12</sup> Good antenatal services are expensive and out of reach to the parents of low socioeconomic status. Improved access to quality prenatal, obstetric and neonatal care services should be provided free or with minimal charge, particularly for the poor. This will reduce birth asphyxia, kernicterus, perinatal and neonatal infections which are major contributor to cerebral palsy in our environment.

The study also showed that more than 75% of the subjects were delivered at home with the help of a neighbour, grandmother or friend; church or at the place of a traditional birth attendance. Deliveries in these places are risky because fetal distress and other non anticipative obstetrics complications may not be identified early enough for proper referral and prompt management.

The commonest type of CP being the spastic type of CP in this study is similar to that reported by others.<sup>11,13</sup> The three most common aetiological factors being hypoxic encephalopathy, bilirubin toxicity ( kernicterus) and CNS infections is in keeping with findings in other reports.<sup>5,14,15</sup> Perinatal events are the commonest causes of CP in resource poor settings like Nigeria.<sup>11,12</sup> This contrasts with the

report of a predominance of brain infections from India<sup>13,16</sup> and problems of low birth weight from the Netherlands.<sup>4,13</sup> Also, sometimes the cause may not be identified or known ( idiopathic CP). This study recorded cases of unknown aetiology. Some genetic/ chromosomal disorders contribute to CP.

In our study few were identified clinically. The clinical parameters used included children with microcephaly, dysmorphic facial features with/ without seizures. Lack of advanced hi-tech laboratory (biochemical assays, chromosomal analysis) and radiological gadgets limited arriving at a definitive diagnosis.

It is not surprising to see many comorbid neurological disorders in these children with cerebral palsy. Neurological co-morbidities such as those found in this study have been reported by others.<sup>5,17</sup> The CP from prematurity may have been due to sepsis, intracranial bleeding and metabolic complications in this group of babies. High rates of co-morbidity are likely to increase the burden of management of CP, as anticonvulsants, speech therapy, hearing aids, special education amongst others will become necessary. Furthermore, looking after physically challenged children has been shown to cause psycho-morbidities in the caregivers.<sup>18-20</sup>

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## Conclusion and recommendation

CP is mainly associated with perinatal events and low socio-economic status. Stringent efforts should be made to prevent these conditions. Traditional birth attendants should be taught simple ways of identifying fetal distress and the need for prompt referral. Mothers and health workers should also be taught simple ways of recognizing jaundice in babies and ensure proper management.<sup>18</sup> The rarity of prenatal causes of CP in this study may reflect inability to investigate high-risk pregnant women and their infants adequately, particularly for intra-uterine infections. Counseling from health visitors could improve compliance and the chances of rehabilitation. Continuing education of health workers and traditional birth attendants about the prevention of asphyxia and training to identify jaundice and neonatal infections will reduce the morbidity and mortality associated with cerebral palsy.

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