

A review of clinical presentation and physiotherapy management of cerebral palsy patients in Esut teaching hospital, Enugu, Nigeria

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Abstract

Background: Cerebral palsy affects the general neurological development of those involved. This usually culminates into various muscular deficits some of which are amenable to physiotherapy intervention and rehabilitation.

Method: A 6 year retrospective study was conducted to find out the clinical presentation and physiotherapy management of cerebral palsy patients in ESUT Teaching Hospital Enugu, Nigeria, between June 2009 and May, 2015.

Result: 146(30.2%) cases of cerebral palsy were noted out of 483 children seen within the period. There was male predominance n- 86(58.9%) and the commonest cause of cerebral palsy was birth asphyxia n- 56(38.4%).

Several physiotherapy treatment modalities were applied, the common ones being neurodevelopment therapy, trans-cutaneous electric nerve stimulation, and passive and active exercise modules.

Majority of the patients' accessed treatment less than 5 times n- 86(59%) and were lost to follow up subsequently. Slightly more than 10% of the patients accessed treatment consistently for 3 months.

Conclusion: High level of abandonment of treatment and lack of more modern physiotherapy modalities were noted. There is need to emphasize better health education of parents/guardians of the patients and improve social welfare benefits for the patients.

Keywords: Cerebral palsy, rehabilitation, social welfare.

DOI: <https://dx.doi.org/10.4314/ahs.v19i4.30>

Cite as: Okenwa W, Edeh A. A review of clinical presentation and physiotherapy management of cerebral palsy patients in Esut teaching hospital, Enugu, Nigeria. *Afri Health Sci.*2019;19(4):3085-3090. <https://dx.doi.org/10.4314/ahs.v19i4.30>

Introduction

Cerebral palsy describes a group of permanent disorders of development of movement and posture, causing activity limitation, that are attributed to non-progressive disturbances that occurred in the developing fetal or infant brain.¹ The injury to the brain can occur during pregnancy, at birth or within the first few years of life.³

Affected individuals usually present with movement disorders which appear in early childhood. The disorders are permanent but clinical manifestation may change or worsen over time. Such children may exhibit spasticity, ataxia, dystonia or athetosis. The majority of individuals with cerebral palsy present with spasticity which is a velocity-dependent response to passive muscle stretch.

Weakness, shortened muscle-tendon units, and impaired selective motor control are often present in spastic cerebral palsy. In this, the affected limb or limbs are held in a characteristic posture which may be flexed, extended, internally or externally rotated, adducted, abducted or a combination of these. Passive movement of a joint meets with increasing resistance and co-ordination is poor in the affected limb(s). The movement disorder seen in cerebral palsy can be broadly grouped into positive signs (spasticity, hyperkinetic dystonia, and rigidity) and negative signs (weakness, hypotonia, bradykinesia, reduced selective motor control, ataxia, balance disorders and dyspraxia).²⁷ The challenge in muscle co-ordination may also affect the speech of the individual and often there is delayed or retarded growth and intellectual development with attendant social and financial sequelae². Kyphoscoliosis may also occur due to hypertonia of spinal muscles and this may provoke respiratory failure when the intercostal muscles and diaphragm are involved in the poor muscle co-ordination seen in cerebral palsy.

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Finding the cause of cerebral palsy even in children with clear cut clinical evidence may not be straight forward,¹ though history of abnormal motor development which is non-progressive may help in locating the site of the lesion in the brain after thorough physical examination.⁴ Many risk factors such as birth asphyxia, low birth weight, neonatal convulsions, and neonatal jaundice have been associated with the occurrence and the type of cerebral palsy.^{5,6}

Ideally it is held that management of cerebral palsy requires comprehensive and effective physical rehabilitation.^{9,15} This involves combined effort of a medical team comprising, neurologist, orthopedic Surgeon, nurse, physiotherapist, speech therapist, occupational therapist, and social welfare worker.

In managing individuals with cerebral palsy, the aim is to reduce the burden of care through maximizing the functional capacity that is still available in the child in order for the individual to be as independent as could be using a well-structured rehabilitation program.

The rehabilitation programs necessarily involve the parents, are usually expensive and may not be affordable by the average Nigerian family.²

The important role of physiotherapy in management of neurological pathologies has been reported.^{18,24} In cerebral palsy, early physical therapy to encourage completion of normal development in affected children may be beneficial.²⁶

This study was conducted to document our experience with physiotherapy management of children with cerebral palsy.

Materials and method

The clinical records of children with cerebral palsy who attended the physiotherapy out-patient clinic of our tertiary hospital from June 2009 to May 2015 were retrieved and retrospectively studied. Using a designed pro-forma, data extracted from the records included age of the patient on first presentation, sex, diagnosis, social indices

of the parents, number of clinic visits of the patient and treatments administered.

Using the office of population census and survey (OPCS) London (1991) standard occupational classification volume 3, recommendation, the parents were classified into classes I, II, III, IV and V. The system takes into consideration, the occupation, economic and educational status of the individual. Class I is for professionals/senior politicians/captains of industries, Class II for senior managers/business people, Class III for skilled manual workers/supervisors, Class IV for unskilled/uneducated workers and Class V for unemployed/social mothers/vagrants.

The use or otherwise of standard modern treatment modalities was noted and recorded accordingly. Patients who did not come on follow up visits after 6 months were regarded as having abandoned treatment.

Data collected were analyzed using simple statistical methods and grouped into tables.

Results

Our study found 146 cerebral palsy children out of 483 children registered in the out-patient physiotherapy clinic. This means 30.2% of children visiting the clinic at the time. The age range of the patients was 0.42 to 9 years, with mean of 2.8 years and average annual presentation was 20.8 patients. 86(58.9%) were males and 60(41.1%) were females.

The patients were referred from the pediatric neurology clinic and the orthopedic surgery clinic of the hospital. There were also referrals from mission hospitals, private hospitals and general hospitals around Enugu, our teaching hospital being the only public hospital in the city with functional pediatric physiotherapy unit.

Majority of the patients 118(80.8%) presented at age 2years or less, 24(15.8%) patients were between 2 and 4 years, 4(2.7%) patients presented at age 5-6 years and 1(0.7%) patient presented at age 9 years. (Table 1).

Table 1. Age at presentation

Age	No		Percentage (%)
	M	F	
<2 years	68	50	80.8
2 – 4 years	14	10	15.8
4-6 years	3	1	2.7
6 – 10 years	1	-	0.7
Total	86(59.0%)	60(41.0%)	100%

Table 2 shows that the commonest type of cerebral Palsy seen was spastic 114 (78.1%). Other forms of cerebral palsy recorded were mixed 18(12.3%), dyskinetic 6(4.1%), hypotonia 5(3.4%) and ataxic form the least at 3(2.1%). Topographic distribution of cerebral palsy showed 23(20.2%) were quadriplegic, 32(28.0%) hemiple-

gic, 46(40.4%) diplegic and 13(11.4%) were unrecorded. Different possible etiologies seen are as shown in table 3. Birth asphyxia 56(38.4%) was the commonest etiologic factor followed by febrile convulsions 39(26.7%), Neonatal jaundice 37(25.3%), Meningitis 9(6.2%), and prematurity 5(3.4%).

Table 2. Types of cerebral palsy

Type	Male	Female	No	%
Spastic	67	47	114	78.1
Dyskinetic	5	1	6	4.1
Ataxic	2	1	3	2.1
Hypotonia	4	1	5	3.4
Mixed	8	10	18	12.3
	86	60	146	100

Table 3. Causes of cerebral palsy

Cause	Sex		Percentage (%)
	M	F	
Neonatal Jaundice	16	21	25.3
Birth Asphyxia	35	21	38.4
Febrile compulsion	26	13	26.7
Meningitis	6	3	6.2
Trauma	0	0	0
Preterm delivery	3	2	3.4
	86 (59%)	60 (41%)	100%

Utilization of physiotherapy services provided does not seem to be very good as shown in table 4. 86 patients (59.0%) had 5 or less physiotherapy sessions. 20 patients (13.6%) 6 – 10 sessions, 12 patients (8.2%) had 11-15 sessions, 13 patients (9.0%) had 16-20 sessions, 4 patients (2.7%) had 21–25 sessions and only 11 patients (7.5%) had 25 sessions and above. Using the gross motor function classification system expanded and revised (GMFCS E & R): 28(19.2%) children who had physiotherapy for 3

months or more, were classified thus; class III, 14(9.5%), class IV, 8(5.5%), and class V, 6(4.1%).

Table 5 shows the social distribution of the parents using occupation and educational status as the yard stick. 64 patients (43.8) belong to class IV and were in majority while class I has the least presentation. Over 90% belong to the lower class (classes III, IV, and V).

The official cost of every physiotherapy session was 10 USD. This excludes cost of both drugs and transportation.

Table 4. Duration of physiotherapy treatment

No of Physio. session	No of Patients	Percentage (%)
1 – 5	86	59.0
6 – 10	20	13.6
11 – 15	12	8.2
16 – 20	13	9.0
21 – 25	4	2.7
>25	11	7.5
	146	100

Table 5. Social class of patients

Class	No	%
I	4	2.9
II	6	4.1
III	42	28.8
IV	64	43.8
V	30	20.6
	146	100

Neuro-developmental therapy was the mainstay of physiotherapy treatment (88%). Other treatment modalities applied were exercise therapy (68%), infrared radiation therapy (76%), constraint induced movement therapy (32%), electrical stimulation (58%) as well as casting and splinting (35%).

The use of Botulinum Toxin A, speech and occupational therapy were not recorded. There was no obvious rehabilitation program that is dedicated to cerebral palsy.

Discussion

Cerebral palsy is noted to be a common neurological disorder of childhood in Nigeria.^{2,7} Our study found that 30.2% of children who visited our physiotherapy clinic within the study period had cerebral palsy. This is higher than some reports in Nigeria that reported 16.0%⁸ and 16.2%⁹ but lower than others: 50.3% reported by Ogunlesi et al² in Sagamu, Nigeria and 36.45% by researchers in Port Harcourt, Nigeria.¹⁵

The high number of cerebral palsy cases visiting the physiotherapy clinic of our hospital can be attributed to the accessibility of the hospital from all centers nearby as it is centrally located. Also having a functional pediatric physiotherapy unit may be a factor. It is possible also that there is rising prevalence of cerebral palsy cases in

Nigeria due to increase in the number of neonates at risk of cerebral palsy because of poorly supervised deliveries. There are however conflicting reports of prevalence from other parts of the world. While some researchers are reporting decreasing prevalence,^{10,13} others are reporting increasing prevalence.^{14,15}

Male children predominance was noted in our study and is similar to the findings in some other reports^{14,15} but different from the findings of Buljina et al¹⁶ where slight female predominance was noted.

Spastic type of cerebral palsy dominated in our study and this is in keeping with reported general pattern of clinical presentation in other studies.^{2,14,15} Diplegic pattern of paralysis was commonest in our study. This is similar to the findings by El-Rifai et al in Saudi Arabia¹⁷ but different from findings in Port Harcourt, Nigeria¹⁵ and Ibadan, Nigeria¹⁸ where the commonest form of spastic paralysis was quadriplegic.

It has been reported that events in the prenatal period like jaundice and asphyxia are leading causes of cerebral palsy in resource limited settings like Nigeria.^{2,9,14} In Netherlands¹⁹ and India²⁰, problems of low birth weight and brain infections respectively are still top of the list of associated risk factors for cerebral palsy. The common

finding of birth asphyxia in our study may be attributed to high rate of poorly conducted vaginal deliveries. It is also possible that some women may skip ante-natal clinic visits due to ignorance, financial difficulties and religious and cultural practices thus denying themselves and their babies the chances of getting invaluable advice that may be useful in having well babies.

Socio-economic classification of the subjects of our study showed that majority of them belong to the lower rung of the group III, IV and V. These are people who may not have the best of education, access to information and the financial capacity to make use of medical facilities that can be of use in preventing cerebral palsy. Ogunlesi et al² also noted predominance of low socio-economic group in their study in Sagamu in Nigeria. Classes I and II individuals may access care in private institutions or even overseas as they have the financial capability to do that. It is difficult to establish that cerebral palsy occur more in low socio-economic groups than the upper socio-economic groups, however, because the lower groups apparently have poor education and economic strength, preventable causes may be seen more in those groups. High level of default was noted in our study as had been reported earlier by other authors^{2,21}. This may be related to inability to afford the cost of treatment as most of the patients by virtue of their socio-economic class may not be able to afford the financial demands. In an environment where minimum wage is about \$70.00 per month, and the cost of each physiotherapy session is \$10.00, keeping pace with treatment will be an uphill task. These children may be abandoned in their houses and be left out completely in their families' scheme of events that visitors to the house may not even know that such children are in the families.

Neurodevelopmental therapy popularized by Bobarth is the commonest form of physiotherapy treatment offered in our study. This treatment modality had been faulted as not being as useful as it was made to look.²² The use of Botulinum toxin in management of cerebral palsy has become the notable addition to the armamentarium of cerebral palsy treatment options^{23,25} and when combined with other modalities of treatment produce better result.²²

Conclusion

Cerebral palsy still constitutes a major part of the neurological disability in our children. Every effort must be made to keep away preventable causes of cerebral pal-

sy while scaling up provision of modern management facilities in our institutions. Delivery room measures to prevent birth asphyxia by anticipation and adequate resuscitation of all at risk babies may reduce the prevalence in Enugu.

Training and retraining of all members of the cerebral palsy management team and medical insurance cover for cerebral palsy physiotherapy may be of uttermost importance in ensuring that the children affected get the best out of life, their disability notwithstanding. Parents and guardians of cerebral palsy patients should be properly educated on the benefits of persevering with the treatment of their wards even though it may be slow in coming.

Conflict of interest

None declared.

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