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Comparative assessment of motor function in children with spastic cerebral palsy subjected to two modalities of physiotherapy

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ABSTRACT

Background: Cerebral palsy (CP) is one of the most common disorders in patients presenting to Paediatric Neurology Clinics in Nigeria with most of them being spastic CP cases. **Aim:** This study aimed to do a comparative assessment of motor function in children with spastic cerebral palsy subjected to two modalities of physiotherapy. **Materials and Methods:** This was a two-group randomized-subjects pretest-posttest study among 170 children with spastic cerebral palsy attending the Paediatric Neurology Clinic of Usmanu Danfodio University Teaching Hospital (UDUTH), Sokoto, Nigeria. They were selected by universal sampling and randomized into continuous and intermittent physiotherapy treatment groups. Assessment of spasticity and motor function was done in the respective groups at baseline (together with questionnaire administration), and after 12 weeks and 24 weeks of treatment using the MAS and the GMFM-88 scales. **Results:** Spasticity reduced steadily in the two treatment groups at 3 and 6 months of therapy, and the proportion of participants with severe spasticity reduced significantly from 36.5% and 40.0% at baseline in the continuous and intermittent groups respectively to 5.9% at 6 months of treatment in both groups. Also, there was a steady increase in motor function at 3 months and 6 months with a significant increase in motor function at 6 months as compared to baseline in both groups. There was no significant difference ($p > 0.05$) between the two treatment groups with regard to reduction in spasticity and improvement in motor function. **Conclusion:** This study shows that there is no significant difference between continuous and intermittent physiotherapy in terms of reduction in spasticity and improvement in motor function. This gives healthcare providers the option of tailoring the choice of therapy to what is more convenient for the patients and their caregivers.

Keywords: Motor function, spastic cerebral palsy, physiotherapy, children

INTRODUCTION

Cerebral palsy (CP) is one of the most common disorders in patients presenting to Paediatric Neurology Clinics in Nigeria and worldwide[1]. The prevalence of CP world-wide is estimated to be 2/1000 live births.[2] A study conducted in Port Harcourt, Nigeria, reported that 834 (36.45%) of the 2,288 patients with neurological problems that were seen over a period of 2 years were spastic CP cases.[3] Another study conducted in Sagamu reported that 92 (50.3%) of the 183 patients with neurological problems that were seen over a period of 6 years were spastic CP cases.[4]Whereas, spastic CP is majorly associated with brain infections (i.e., meningitis, encephalitis, cerebral malaria) in India,[5] in Nigeria, poor obstetric care, central nervous system infections and other preventable causes like malnutrition, prematurity and low birth weight contribute majorly to the etiology of CP.[6,7] Birth asphyxia ranks the highest followed by kernicterus and then central nervous system infection in studies conducted in Ibadan and Zaria.[8,9] Children are disproportionately affected and face an added burden of poverty, inadequate health facilities, stigmatization and lack of facilities for rehabilitativecare.[10]

Spasticity causes participation restrictions in a child's home, school and community.[11] It is a major cause of disability in childhood with a greater burden in under-developed countries, and with enormous physical, social and economic costs. It occurs early in life, therefore parents, care givers and patients need the best management options to improve the quality of life of these patients.[12]For decades, comprehensive and effective physical rehabilitation has been the main intervention used to minimize spasticity, although physical recovery is rarely complete even with the best rehabilitation.[4,13] Physical therapy helps to promote,

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maintain and restore physical, psychological and social well-being. It also prevents deformities and delays surgical intervention leading to patient's optimal function and effective living.[14]

Over the years two major physical therapy regimens have emerged. These include the conventional therapy in which involves once or twice per week physiotherapy, and intermittent intensive therapy in which patients are offered 4 physiotherapy sessions per week over a period of 24 weeks, and with each physiotherapy session lasting for 45 minutes.[15] Studies have been carried out all over the world on the effect of these different modalities of physiotherapy (conventional and intermittent) on improving motor function in cerebral palsy patients.[16-18]

However, the effects of the two modalities remain controversial. While Christiansen et al. and Bower et al. observed that intermittent therapy was not superior to the conventional therapy,[15,19] Trahan and Malouin had a contrary view, as they concluded that intermittent physiotherapy led to more marked improvement in the motor function of the patients.[20] The aim of this study is to conduct a comparative assessment of motor function in children with spastic cerebral palsy using two modalities of physiotherapy (conventional and intermittent intensive) in order to determine which modality best improves patients' gross motor function. The findings of the study would guide healthcare providers in the choice of the appropriate treatment modality for patients with spastic CP.

MATERIALS AND METHODS

Study Design and Population

This was a two-group randomized-subjects pretest-posttest study among children with spastic cerebral palsy attending the Paediatric Neurology Clinic of Usmanu Danfodio University Teaching Hospital (UDUTH), Sokoto, Nigeria. The hospital is a tertiary healthcare facility that serves the residents of Sokoto State and the neighboring states including Zamfara, Kebbi and Katsina. The neurology clinic runs weekly where an average of 20 old cases and 5-7 new cases are seen on every clinic day of which 1-2 may be cases of cerebral palsy.

Multidisciplinary specialized care is usually provided for the patients by a team that comprised paediatric neurologists, physiotherapists, ophthalmologists and orthopaedic surgeons. Children aged 2-15 years who were newly diagnosed of spastic cerebral palsy (spastic monoplegic, spastic diplegic, spastic hemiplegic and spastic quadriplegic) attending the Paediatric Neurology Clinic of the hospital, and whose parents consented to the study or gave assent to participate in the study (i.e., those who were aged ≥ 7 years) were considered eligible and enrolled into the study. Those who have previously been attending the neurology clinic but have never had physiotherapy were also considered eligible to participate in the study. Those with spastic cerebral palsy who were already on anti-convulsants or other muscle-relaxant drugs, those with other forms of cerebral palsy other than spastic cerebral palsy, those with spastic CP who have undergone cerebral palsy related orthopaedic surgery,[21] those with spastic cerebral palsy with fixed contractures, and those with acute febrile illnesses or diarrhoea related illnesses at the time of assessment,[11] were excluded.

Sample Size Estimation and Sampling Technique

The sample size was estimated at 76 participants per group using the formula for comparing proportions in an experimental study,[22] an83.5% prevalence of motor dysfunction among spastic cerebral palsy patients in a previous study,[1] and a 20% projected reduction in motor dysfunction post intervention. Eighty-five eligible study participants were enrolled per group in anticipation of a 10% attrition rate, and they were selected by universal sampling (i.e., every eligible patient whose parent/guardian consented to the study was enrolled into the study until the required sample size was obtained in view of the limited number of patients that are seen weekly).

Data Collection

An interviewer administered questionnaire was adapted from the instrument used in previous studies[1,9] and used to obtain information on the socio-demographic and clinical characteristic of the study participants. Participants also had physical examination done, and this comprised assessment of muscle tone, muscle power, active and passive range of motion of joints, sensation, deep tendon reflexes, station (pelvic and leg alignment while standing, if there is a possibility), presence of upper and lower limbs' deformity, spinal alignment and gait.

The patients were randomized into 2 treatment groups by block randomization (Figure 1). The treatment groups were based on the modality of treatment as follows:

- Continuous group: This group received the conventional once a week physiotherapy regimen for 24 weeks without a pause.[19]

- Intermittent group: This group received an intensive physiotherapy phase (i.e., 4 sessions per week for 4 weeks) followed by a period of pause for 6 weeks, and then the sequence is repeated again, thus making a total of 24 weeks.[15]

A baseline assessment was done using the Modified Ashworth Scale (MAS)[64] and the Gross Motor Function Measure-88 (GMFM_88)[23,24] at the onset of the study. The outcomes were also measured subsequently at 12 weeks and at 24 weeks using the MAS and the GMFM-88 scales.[15,25,26] A pilot study was conducted on 10 patients two weeks before the onset of the study to reach an agreement about the scoring of MAS. This included the positioning of patient, speed of movement, number of movements per joint by the examiner. Independent assessments were made by two physiotherapists and the inter-rater reliability revealed strong correlation between the two examiners (r = 0.719, p = 0.019). Also, for GMFM-88, an independent assessment was made by two physiotherapists and the inter-rater reliability also showed strong correlation between the two examiners (r = 0.990, p = 0.001). Disagreements concerning the use of MAS and GMFM-88were clarified with the physiotherapists.[15]

Data Analysis

Data were processed using the IBM Statistical Package for the Social Sciences (SPSS) version 21. Quantitative variables were summarized using means and standard deviations, while qualitative variables were summarized using frequencies and percentages. The Chi-square test was used to test for difference in proportions between the two treatment groups at baseline. The independent T test was used to test for significant differences in the means of the MAS and GMFM-88 scores in the two groups at pre- and post-intervention, while the repeated measures analysis of variance (ANOVA) was used to test for significant differences in the means of the MAS and GMFM scores in each of the respective groups at baseline, 12 weeks and 24 weeks. All levels of statistical significance were set at $p < 0.05$.

Ethical Consideration

Ethical clearance for the study was obtained from the Research and Ethics committee of the Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto, Nigeria. Permission to conduct the study was obtained from the management of the hospital, while informed written consent was obtained from the parents and caregivers. In addition to consent from parents and guardians, assent was also obtained from children that were aged ≥ 7 years.

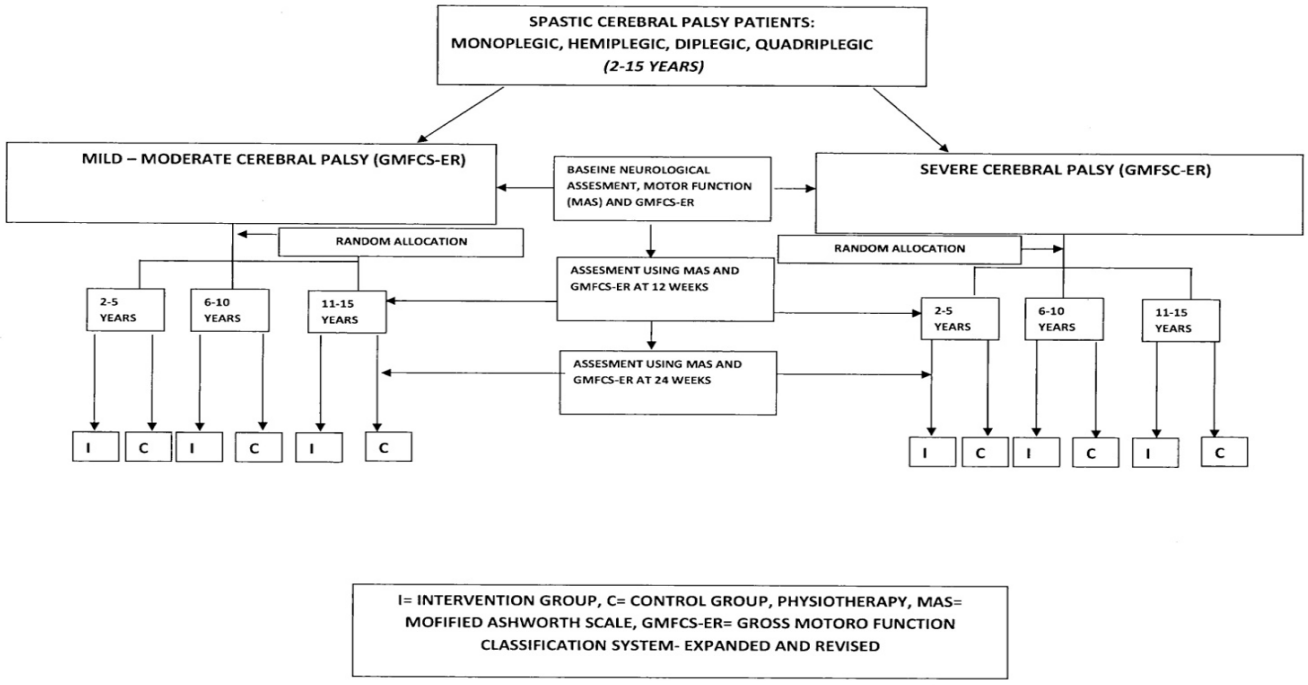

Figure 1: Skeletal framework of the study

RESULTS

Socio-demographic and clinical characteristics of participants

A total of 197 children were diagnosed with spastic cerebral palsy at the Paediatric Neurology Clinic of UDUTH, Sokoto, Nigeria over a period of 6 months. Of these 170 children that satisfied the inclusion criteria and fully complied with the schedules of physiotherapy in the 2 treatment groups (i.e., 85 participants per group) were included in the analysis. The mean age of the participants in the continuous group was 66.45 ± 47.7 months, while that of the intermittent group was 63.44 ± 44.29 months. There was no significant difference ($p > 0.05$) in the mean ages of the participants in both groups. Majority of the participants in both groups were aged 2-5 years, and there was no significant difference ($p > 0.05$) in the age distribution of both groups.

Majority of the participants in both groups were males (continuous group = 57.6%, Intermittent group = 60.0%) with an M:F ratio of 1.4:1; and there was no significant difference in the sex distribution of both groups. The quadriplegic type of CP predominated in both the continuous group (48.2%) and in the intermittent group (40%), and there was no significant difference ($p > 0.05$) in the distribution of type of CP in both groups. Close to half of the participants in both groups (47.1% in each group) had severe form of CP, and majority of the participants in both groups had moderate to severe spasticity. There was no significant difference in the severity of CP and spasticity in both groups. Likewise, there was no significant difference ($p > 0.05$) in the mean spasticity scores in the respective limbs in both groups, and in the overall mean GMFM-88 scores in both groups (Table 1).

Participants' spasticity and gross motor function status at baseline

The quadriplegic type of spastic CP showed more spasticity at baseline compared to the other types 3.39 ± 0.79 in the continuous group whereas the monoplegic type of spastic CP showed more spasticity in the intermittent group 3.67 ± 0.58. However, there was no significant difference in the spasticity scores of the various types of CP in both groups, except for the Lt hemiplegic type which had a significantly higher score ($p < 0.05$) in the intermittent group (2.75 ± 0.96) as compared to the continuous group (2.28 ± 0.71) [Table 2].The monoplegic type had the highest gross motor function scores compared to the other types in both groups, while the quadriplegic type had the lowest gross motor function scores; but there was no significant difference ($p > 0.05$) in the gross motor scores of the various types of CP in both groups (Table 3).

Effect of treatment on spasticity among participants

There was a steady reduction in the mean spasticity scores in all the children following physiotherapy in both the continuous and the intermittent groups after 3 months, but the reduction was statistically significant in only the quadriplegic type in both treatment groups. After 6 months of therapy, marked and statistically significant reductions were observed in the spasticity scores in the various spastic CP types in both groups (Table 4). The proportion of participants with severe spasticity reduced substantially after 3 months treatment in both groups from 36.5% at baseline to 18.8% after 3 months in the continuous group, and from 40.0% at baseline to 22.4% after 3 months in the intermittent group, but there was no significant difference in the reductions in the two treatment groups. After 6 months treatment, the proportion of participants with severe spasticity reduced drastically to 5.9% in both groups (Table 5).

Effect of treatment on gross motor function among participants

Most of the participants showed an increase in their motor function steadily at 3 months and 6 months, but the improvement observed was more remarkable at 6 months as compared to 3 months in both the continuous and intermittent treatment groups (Table 6). Whereas, significant differences in improvement in gross motor function were observed in the respective spastic CP types in the two treatment groups (Table 6), overall, there was no significant difference in improvement in gross motor function at 3 and 6 months in the two treatment groups (Table 7).

DISCUSSION

This study assessed motor function in children with spastic cerebral palsy subjected to two modalities of physiotherapy. Under-fives constituted a larger proportion of the children while 11-15years was the lowest. This may be due to the fact that mortality is high amongst CP patients and the older ones tend to die from associated complications of CP. Majority of the children belong to the 2-5 years age group, this is similar to what was reported in studies done amongst CP children in Nigeria.[1,3,4,27,28] Males predominated in this study 100 (58.8%) which is similar to the other studies conducted in Nigeria[1,3,4,29,30] and other parts of the world.[15,20]

Table 1: Socio-demographic and clinical characteristics of participants

Variables	Treatment group		Test of significance
	Continuous, n = 85 Frequency (%)	Intermittent, n = 85 Frequency (%)	
Age (months)			
Mean	66.45 ± 47.78	63.44 ± 44.29	t = 0.426
Range	24-180	24-180	p = 0.671
Age group (years)			
2 - <6	53 (62.4)	53 (62.4)	χ^2= 0.000,
6 - <11	22 (25.9)	22 (25.9)	p = 1.000
11 - <15	10 (11.8)	10 (11.8)	
Sex			
Male	49 (57.6)	51 (60.0)	χ^2= 0.970,
Female	36 (42.4)	34 (40.0)	p = 0.755
Type of spastic CP			
Monoplegia	6 (7.0)	3 (3.5)	χ^2= 5.013,
Hemiplegia	19 (22.4)	18 (21.2)	p = 0.286
Diplegia	16 (18.8)	26 (30.6)	
Triplegia	0 (0)	1 (1.2)	
Quadriplegia	44 (51.8)	37 (43.5)	
GMFCS-ER			
Mild CP	30 (35.3)	28 (32.9)	χ^2= 3.682,
Moderate CP	15 (17.6)	17 (20.0)	p = 0.451
Severe CP	40 (47.1)	40 (47.1)	
Spasticity			
Mild	13 (15.3)	10 (11.8)	χ^2= 0.530,
Moderate	41 (48.2)	41 (48.2)	p = 0.767
Severe	31 (36.5)	34 (40)	
Mean spasticity score			
RUE MAS	3.41 ± 0.77	3.34 ± 0.71	t = 0.180, p = 0.857
LUE MAS	3.34 ± 0.71	3.38 ± 0.75	t = 0.854, p = 0.789
RLE MAS	3.41 ± 0.83	3.55 ± 0.67	t = 0.854, p = 0.395
LLE MAS	3.34 ± 0.76	3.48 ± 0.74	t = 1.026, p = 0.307
Mean GMFM-88 score	42.75 ± 32.71	37.47 ± 31.03	t = 0.963, p = 0.338

CP: Cerebral palsy; GFMFCS-ER: Gross Motor Classification System-Expanded and Revised; MAS: Modified Ashworth Scale; RUE: Rt upper extremity; LUE: Lt upper extremity; RLE: Right lower extremity; LLE: Left lower extremity

Table 2: Participants' spasticity scores in different types of spastic cerebral palsy at baseline

Type of spastic cerebral palsy	Treatment group		Test of significance
	Continuous Mean ± SD	Intermittent Mean ± SD	
Monoplegia	3.17 ± 0.98	3.67 ± 0.58	t = 0.798, p = 0.451
Diplegia	3.36 ± 0.50	3.20 ± 0.76	t = 0.690, p = 0.494
Lt Hemiplegia	2.28 ± 0.71	2.75 ± 0.96	t = 0.000, p < 0.001*
Rt hemiplegia	2.91 ± 0.70	3.07 ± 0.70	t = 0.562, p = 0.858
Quadriplegia	3.39 ± 0.79	3.50 ± 0.12	t = 0.555, p = 0.581

*Statistically significant (p < 0.05)

Table 3: Participants' gross motor function scores in different types of spastic cerebral palsy at baseline

Type of spastic cerebral palsy	Treatment group		Test of significance
	Continuous Mean ± SD	Intermittent Mean ± SD	
Monoplegia	78.52 ± 20.34	82.55 ± 16.53	t = 0.279, p = 0.791
Diplegia	41.82 ± 28.07	43.58 ± 25.03	t = 0.710, p = 0.944
Hemiplegia	69.10 ± 19.49	50.38 ± 31.98	t = 1.936, p = 0.630
Quadriplegia	28.53 ± 30.60	28.53 ± 0.60	t = 0.125, p = 0.901

Table 4: Comparative assessment of spasticity at baseline, 3 months and 6 months according to subtypes of spastic CP

Type of spastic CP	Continuous group, n = 85		Intermittent group, n = 85	
	MAS Score Mean ± SD	Test of significance	MAS Score Mean ± SD	Test of significance
Monoplegia				
Baseline	3.170 ± 0.983		3.667 ± 0.577	
At 3 months	2.830 ± 0.752	t = 1.581, p = 0.175	3.000 ± 0.001	t = 2.000, p = 0.184
At 6 months	1.830 ± 0.983	t = 2.739, p = 0.041*	2.333 ± 1.154	t = 1.000, p = 0.423
Diplegia				
Baseline	3.360 ± 0.497		3.200 ± 0.764	
At 3 months	3.070 ± 0.616	t = 2.280, p = 0.400	2.760 ± 0.926	t = 4.342, p < 0.001*
At 6 months	2.360 ± 0.497	t = 5.701, p < 0.001*	2.160 ± 1.028	t = 6.000, p < 0.001*
Rt Hemiplegia				
Baseline	2.909 ± 0.701		3.071 ± 0.730	
At 3 months	2.636 ± 0.674	t = 1.936 p = 0.820	2.929 ± 0.616	t = 1.472, p = 0.165
At 6 months	1.727 ± 0.647	t = 5.590, p < 0.001*	2.142 ± 0.663	t = 6.904, p < 0.001*
Lt Hemiplegia				
Baseline	2.750 ± 0.707		2.750 ± 0.957	
At 3 months	2.125 ± 0.835	t = 3.416, p = 0.110	2.750 ± 0.957	t = 1.500, p = 0.165
At 6 months	1.727 ± 0.647	t = 2.646, p = 0.330	2.143 ± 0.663	t = 6.000, p < 0.001*
Quadriplegia				
Baseline	3.361 ± 0.761		3.432 ± 0.590	
At 3 months	3.138 ± 0.866	t = 2.935, p < 0.001*	3.189 ± 0.761	t = 2.145, p < 0.001*
At 6 months	2.583 ± 1.052	t = 5.488, p < 0.001*	2.513 ± 0.750	t = 6.191, p < 0.001*

*Statistically significant ($p < 0.05$)

Table 5: Comparison of grading of severity of spasticity at baseline, 3 months and 6 months

Phase of treatment	Severity of spasticity	Continuous group, n = 85 Frequency (%)	Intermittent group, n = 85 Frequency (%)	Test of significance
Baseline	Minimal – moderate	54 (63.5)	51 (60.0)	χ^2= 0.224; p = 0.636
	Severe	31 (36.5)	34 (40.0)	
3 months	Minimal – moderate	69 (81.2)	66 (77.6)	χ^2= 0.324; p = 0.569
	Severe	16 (18.8)	19 (22.4)	
6 months	Minimal – moderate	80 (94.1)	80 (94.1)	χ^2< 0.001; p = 1.000
	Severe	5 (5.9)	5 (5.9)	

Table 6: Comparative assessment of gross motor function at baseline, 3 months and 6 months according to subtypes of spastic CP

Variables	Continuous group Mean ± SD	Intermittent group Mean ± SD	Mean difference	Test of significance
Monoplegia				
Baseline	78.52 ± 20.34	82.55 ± 16.53	-4.03	
At 3 months	82.55 ± 17.60	84.54 ± 15.14	-3.38	t = 0.120, p = 0.034*
At 6 months	86.27 ± 11.60	86.27 ± 14.67	-2.16	
Diplegia				
Baseline	44.28 ± 27.82	43.58 ± 25.04	0.70	
At 3 months	48.09 ± 27.48	48.65 ± 25.20	-0.56	t = 0.038, p < 0.001*
At 6 months	51.03 ± 21.96	51.04 ± 21.96	-0.13	
Hemiplegia				
Baseline	69.10 ± 19.50	50.38 ± 31.99	1.94	
At 3 months	73.52 ± 19.19	56.89 ± 29.94	1.81	t = 0.044, p < 0.001*
At 6 months	75.03 ± 17.80	61.47 ± 28.54	1.56	
Quadriplegia				
Baseline	23.39 ± 27.59	24.46 ± 29.33	-0.13	
At 3 months	28.04 ± 28.20	28.51 ± 29.49	-0.05	t = 0.011, p < 0.001*
At 6 months	31.19 ± 24.96	31.19 ± 24.96	-0.12	

*Statistically significant (p < 0.05)

Table 7: Comparison of scores of GMFM-88 at pre- and post-treatment

Phase of treatment	Continuous group, n = 85 MAS Score Mean ± SD	Intermittent group, n = 85 MAS Score Mean ± SD	Test of significance
Baseline	42.75 ± 32.71	37.47 ± 31.03	t = 0.963, p = 0.338
3 months	47.17 ± 32.49	42.27 ± 31.01	t = 0.896, p = 0.372
6 months	49.75 ± 31.18	45.07 ± 28.82	t = 0.904, p = 0.368

The reasons why males tend to have more neurological problems remain uncertain, however, males differ in their response to brain injuries. They also tend to be at risk of more adverse perinatal events, and cultural values and practices in Africa tend to favor the male sex in terms of seeking for medical attention; and the fact that they are considered more valuable than the female children.[31,32]

Spastic quadriplegia was the commonest type of CP in this study which was more associated with severe forms of CP; it remains so in most of the studies conducted in Africa and world-wide.[1,3] Higher incidence of perinatal asphyxia and Central Nervous System infections are noted in Africa which may be responsible for the quadriplegic type.[3,4,28,29]GMFCS-ER assessment in this study revealed more severe form of CP which was also observed in similar studies conducted in Nigeria and other parts of the world.[8,33,34] There is still paucity of data concerning the functional classification of CP since only few hospital workers are aware of this simple tool and the fact that most of the studies done were hospital based.[33] However, this could be due to the fact that more severe forms present to the hospitals in Nigeria.[8] Higher levels of function were observed in other parts of the world in population based studies.[35,36,37]

Spasticity in the upper limbs was higher in this study at baseline than in the lower extremities. This is contrary to what was observed in a study conducted by Gigante et al.[35] who observed more spasticity in the lower limbs. This may be due to a more homogeneous group of children with spastic diplegia and quadriplegia that were included in that study.[35] Overall, in the present study, there was no significant difference in mean spasticity between the two physiotherapy groups. This observation is similar to that obtained by Owoeye et al.[29] at LUTH, Nigeria. Furthermore, in the present study, continuous

physiotherapy was not superior to intermittent physiotherapy in terms of reduction of spasticity. Few studies have been conducted in children in Nigeria using MAS as an outcome measure[38] and those that used it had interventional studies using other modalities of treatment other than physical therapy (neuromuscular electric stimulation, cryotherapy, dorsal rhizotomy, multiple Ayurveda treatment and intra-thecal baclofen).[35,39]

In this study continuous and intermittent physiotherapy were found to be equally effective. Both groups had statistically significant improvement in gross motor scores at 3 and 6 months which was similar to what was obtained by Christiansen et al.[23] who used a similar schedule for continuous and intermittent physiotherapy but for 30 weeks duration instead of the 24 weeks used in this study. However, Christiansen et al.[15] studied a smaller number of homogeneous group of children. None of the groups of physiotherapy in their study resulted in a different GMFM-88 outcome measure.[15,19] Contrary to this, other researchers observed that intermittent physiotherapy was better at improving gross motor function than continuous physiotherapy. Some of these studies were pilot studies[20,40] with the resting period extending for 8 weeks compared to 6 weeks in this study. Furthermore, these authors[20,40] used smaller sample size and more homogeneous group of children. In a meta-analysis which constituted randomized control trials addressing the controversy between the effectiveness of continuous and intermittent physiotherapy, Arpino et al.[16] observed that more intensive therapy may improve outcome measure better.

CONCLUSION

In conclusion, this study shows that there is no difference between continuous and intermittent physiotherapy in terms of reduction in spasticity and improvement in motor function. Children improved steadily at 3months with more marked improvement at 6 months following both types of physiotherapy. This gives Paediatric Neurologists and Paediatric Physiotherapists the option of tailoring the choice of therapy to what is more convenient for the patients and their caregivers. Also, considering the child's clinical presentation, needs and motivation, the choice of physiotherapy should be individualized.

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Nil.

Conflict of interest

None declared.

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