

Feeding Problems at Different Level of Gross Motor Function in Children with Cerebral Palsy

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Author's Contribution

^{1,2 & 3} Conception and design, Collection and assembly of data, Analysis and interpretation of the data, ^{1&2}Critical revision of the article for important intellectual content, Statistical expertise ^{1&2}Final approval and guarantor of the article.

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A B S T R A C T

Objective: To determine the Association and frequency of feeding problems at different level of Gross Motor Function among Cerebral Palsy children.

Methodology: The study design was cross-sectional study; Data was collected from Rising Son and Children Hospital Lahore and completed within 4 months (from March 2019 to July 2019) after approval of synopsis. 41 children, age 2-8 years of age were selected. Data collected using Standardized variables by Nonprobability sampling & analyzed by SPSS-25.

Results: Significant association was found between the level of GMFCS and feeding difficulties (Refuse to eat (P=0.007) and takes >20 minutes to finish meal (P=0.047). No Significant association was found between level of GMFCS and feeding difficulties including (food sits in child's mouth (P=0.788), Child chokes or gags at mealtimes (P=0.723), child's eats only ground, strained or soft food (P=0.620) and require NG feed (P=0.582)). Feeding problems including difficulty in chewing 26.8%, Choking during meal 29.26%, Takes >20 minutes for meal 68.3%, NG feeds 4.9%. food sits in child's mouth and does not swallow it 26.83% Occasionally and 24.4% Regularly. 78.0% child's eats only ground, strained or soft food. 22.05% refuse to eat but requests food immediately after the meal.

Conclusion: Significant association was found between level of GMFCS and feeding difficulties (Refuse to eat and takes >20 minutes to finish a meal). No Significant association was found between level of GMFCS and feeding difficulties including (food sits in child's mouth, Child chokes or gags at mealtimes, child's eats only ground, strained or soft food and require NG feed).

Keywords: Cerebral Palsy, Dysphagia Gross Motor Function Classification System

Introduction

Cerebral Palsy (CP) is a group of permanent movement as well as posture disorder that causes limitation of activity. It is a disorder in brain that is non progressive and occurs at the early stage of development of children.¹ 3-4 children per 1000 are affected with cerebral palsy and it is the commonest motor impairment in children's.^{2,3}

Oropharyngeal dysphagia (OPD) effect the nutritional status, breathing process, and results in increased stress in parents of 2/3 children of CP.⁴ there is inadequate attention on Oropharyngeal Dysphagia and its progression is not well known.⁵ It is very significant to

acknowledge the initial history of difficulty in Swallowing for management of dysphagia and its consequences on health, and development of suitable interventions prompting the dietary and breathing Issues for Cerebral Palsy children.

Difficulty in swallowing is very prevalent in Cerebral Palsy children that results in improper liquid and food intake and decreases the safety of mealtime.⁶ It may further cause respiratory complications, poor dietary intake and poor growth and the affected children also have mealtime prolonged.⁷

On functional activities The Gross motor Function Classification System (GMFCS) has helped the research and it provides classification of the children's current level of Gross Motor Function.^{8, 9} On the base of functional activities of CP child in everyday life, the movement quality, using any of assistive devices including wheel chair mobility or hand held, discrepancies are present within the five levels of Gross Motor Function.¹⁰

Among children, Cerebral Palsy is the major cause of physical problems that are mostly associated with oromotor Function. It is thought that it is the major cause of increased frequency of nutrition problems in children as well as difficulty in mastication, swallowing, impaired respiratory function, and facial expressions and due to this it may interrupt the wellbeing of CP children.¹¹

This Study addressed the feeding problem in the context of the overall development of the child, describes behavioral Feeding problems.

Methodology

A Cross-Sectional Study was done. Data was gathered from the Rising son and Children Hospital Lahore. The study was completed within 04 months from March 2019 to July 2019. The sample size was calculated by sample size determination in health studies version 2.0.21 WHO and number of Cerebral Palsy children registered in this research N=41 keeping the margin of error is equal to 5% and the level of significance is equal to 95%. Nonprobability Consecutive sampling technique was used collect the sample for this study. Children between 2 to 8 years of age having a medical diagnosis of Cerebral palsy and they can understand the questioning process were included in this study whereas those who have warning signs (Hydrocephalus, Microcephalus, Seizures Disorder and Unexplained focal neurologic features And without feeding problem and oral

motor dysfunction were excluded from the study. patients selected were interrogated to make sure that they fulfill the criteria of inclusion in the study. After the synopsis was approved by the ethical committee of the University of Lahore and authorization of all related departments. Participants was explained thoroughly about the testing procedure. The survey questionnaire was called as per the criteria of inclusion of the study. Permission was taken from the authorities of the institution and university committee and then survey was conducted. Data was analyzed using IBM SPSS Statistics 25. Participants responses was collected and all data was entered in SPSS file. Data analyzed by using SPSS and interpreted further results. Demographics was analyzed as Number, percentages, and frequency. Qualitative variables were presented in the form of frequency and percentage (frequency tables and Bar charts). Chi Square Test was applied. The descriptive measure for each variable was calculated and Crosstabulation was performed to check the Association between Gross Motor Function Classification System and Feeding Problems.

Results

Total 41 children with Cerebral Palsy (CP) of age range 2 to 8 years were part of study. The mean age of children was 4.00 ± 1.0 Years. Among the total sample 28 (68.3%) were males and female children were 13(31.7%). Children with Spastic Cerebral Palsy 19 (46.3%), children with Athetosis Cerebral Palsy 10(24.4%), Children with Dyskinetic (Ataxic Cerebral Palsy) 7(17.1%) and children with Hypotonic Cerebral Palsy were 5(12.2%). According to Gross Motor Function Classification System children in GMFCS Level-I were 4(9.8%), in Level II were 9(22%), in Level III were 11(26.8%), in Level IV were 7(17.1%) and in Level V were 10(24.4%) children.

Chi Square Test was applied between Gross Motor Function and different feeding problems. Total

Table I: Comparison of Gross Motor Function Classification System (GMFCS) with Child chokes or gags at mealtimes

Gross Motor Function Classification System (GMFCS)	Child chokes or gags at mealtimes			Total	P-Value
	Rarely	Occasionally	Regularly		
Level-I	2(50.0%)	0(0.0%)	2(50.0%)	4(100.0%)	0.723
Level-II	5(55.5%)	1(11.1%)	3(33.3%)	9(100.0%)	
Level-III	5(45.5%)	2(18.2%)	4(36.4%)	11(100.0%)	
Level-IV	3(42.9%)	2(28.6%)	2(28.6%)	7(100.0%)	
Level-V	5(50.0%)	4(40.0%)	1(10.0%)	10(100.0%)	
Total	20(48.28%)	9(22.5%)	12(29.26%)	41(100%)	

participants were 41 out of which, 20(48.78%) participants reported food sits in child's mouth Rarely, 11(26.83%) Occasionally and 10(24.4%) participants reported that food sits in child's mouth and gag at mealtime (Table I). No significant association ($P>0.05$) was observed. 9(22%) participants reported child's eats only ground, strained or soft food Rarely, 25(61.0%) reported occasionally and 7(17.0%) reported that child's eats only ground, strained or soft food Regularly (Figure 1). When child feeding time was compared with gross motor function classification system, significant association ($p<0.05$) was founded between them (Table II). Similarly, a comparison was done between gross motor function classification system and Child refuses to eat but requests food immediately after the meal, there was a significant ($p<0.05$) association noted between them (Table III). Furthermore, the results showed that there was no significant ($P>0.05$) association between Gross Motor Function Classification System (GMFCS) and Child who required Nasal-Gastric

(NG) feeds to maintain proper nutritional status (Table IV)

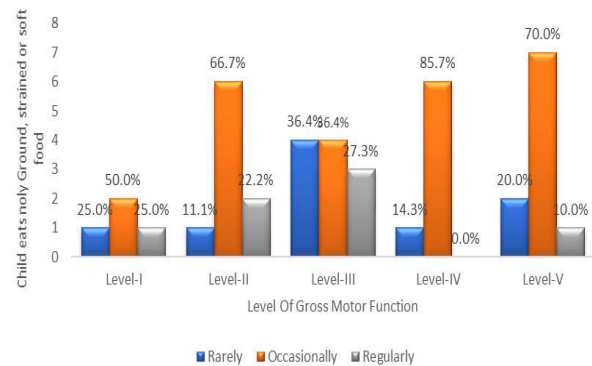


Figure 2. Gross Motor Function Classification System (GMFCS) * Child eats only ground, strained or soft food.

Discussion

Many cerebral palsy children have multiple feeding problems along with other neurological problems, difficulty in swallowing that results in impairments of

Table II: Gross Motor Function Classification System (GMFCS) * Child takes longer than 20 minutes to finish a meal

Gross Motor Function Classification System (GMFCS)	Child takes longer than 20 minutes to finish a meal			Total	P-Value
	Rarely	Occasionally	Regularly		
Level-I	1(25.0%)	2(50.0%)	1(25.0%)	4(100.0%)	0.047
Level-II	1(11.1%)	1(11.1%)	7(77.7%)	9(100.0%)	
Level-III	0(0.0%)	1(9.1%)	10(90.9%)	11(100.0%)	
Level-IV	1(14.3%)	2(28.6%)	4(57.2%)	7(100.0%)	
Level-V	1(10.0%)	3(30.0%)	6(60.0%)	10(100.0%)	
Total	4(9.7%)	9(22.0%)	28(68.3%)	41(100.0%)	

Table III: Gross Motor Function Classification System (GMFCS) * Child refuses to eat but requests food immediately after the meal

Gross Motor Function Classification System (GMFCS)	Child refuses to eat but requests food immediately after the meal			Total	P Value
	Rarely	Occasionally	Regularly		
Level-I	2(50.00%)	2(50.00%)	0(0.00%)	4(100%)	0.007
Level-II	0(0.00%)	3(33.30%)	6(66.70%)	9(100%)	
Level-III	3(27.30%)	8(72.70%)	0(0.00%)	11(100%)	
Level-IV	2(28.60%)	4(57.10%)	1(14.30%)	7(100%)	
Level-V	6(60.00%)	2(20.00%)	2(20.00%)	10(100%)	
Total	13(31.7%)	19(46.3%)	9(22.05%)	41(100%)	

Table IV: Gross Motor Function Classification System (GMFCS) *Child has required Nasal-Gastric (NG) feeds to maintain proper nutritional status.

Gross Motor Function Classification System (GMFCS)	Child has required Nasal-Gastric (NG) feeds to maintain proper nutritional status			Total	P Value
	Rarely	Occasionally	Regularly		
Level-I	3(75.0%)	1(25.0%)	0(0.0%)	4(100.0%)	0.582
Level-II	7(77.8%)	1(11.1%)	1(11.1%)	9(100.0%)	
Level-III	11(100%)	0(0.0%)	0(0.0%)	11(100.0%)	
Level-IV	6(85.7%)	1(14.3%)	0(0.0%)	7(100.0%)	
Level-V	9(90.0%)	0(0.0%)	1(10.0%)	10(100.0%)	
Total	36(87.8%)	3(7.3%)	2(4.9%)	41(100%)	

growth and development of children and other pulmonary infections are most common.^{6, 12}

A study conducted in 2016 that intended to determine the profile of different impairments in CP children according to this study distribution of GMFCS was in Level-I (34%) children, Level-II (25%) children, Level-III (12%) children, Level-IV (13%) children and in Level-V (16%) children. As per our study children in GMFCS Level-I are 4(9.8%), in Level II are 9(22%), in

Level III are 11(26.8%), in Level IV are 7(17.1%) and in Level V are 10(24.4%) children.¹³

A study conducted in 2016 that aimed to determine the Oropharyngeal dysphagia in preschool children, reported that 30% of CP children had moderate and 4% of children had severe Difficulty in swallowing and Gross Motor Function was strongly associated with Oropharyngeal Dysphagia. As per our study 20(48.78%) participants reported food sits in child's mouth and does not swallow it Rarely, 11(26.83%) Occasionally and 10(24.4%) participants reported that Regularly food sits in child's mouth and does not swallow it.¹⁴

Feeding difficulties are common in CP children's with about 89% of children having difficulty in feeding and Gross Motor Function Classification System is a good measure for motor impairments level. CP children may have difficulty in sucking, improper chewing, poor lip closure, and increased risk of aspiration. As per our research Children having feeding problems frequently including Chewing difficulty 26.8%, Choking during meal 26.8%, Takes >20 minutes for meal 41.5%, Irritabilities at mealtimes 39%, Poor appetite 34.1%, NG feeds 4.9%. Current difficulties in spooned purees 26.8%, Difficulty with solids 34.1%. 70% had clinically significant Oral Motor Dysfunction.^{5, 7, 15}

A study was conducted to determine the feeding characteristics of children's. According to this study mealtime was reported >45 minutes in about 40% of children's, 9% children refuse to eat and about 70% of children require Naso-gastric feeds to maintain their nutritional status. As per our study 36(87.8%) Rarely, 3(7.3%) Occasionally and 2(4.9%) Children Regularly required Nasal-Gastric (NG) feeds to maintain proper nutrition's, 4(9.7%) Rarely, 9(22.0%) Occasionally and 28(68.3%) Children Regularly takes longer than 20

minutes to finish a meal. 13(31.7%) Rarely, 19(46.3%) Occasionally and 9(22.05%) Children Regularly refuses to eat but requests food immediately after the meal.¹⁶

Cerebral palsy Children have multiple feeding difficulties at a time, due to lack of awareness in parents of these children these difficulties can further progress. Nutritional deficiencies were present in these children guide the parents of children about how to maintain a proper diet and nutritional status. CP child should be provided with foodstuff that they can easily eat without frustration and stress.

Conclusion

Significant association was found between level of GMFCS and feeding difficulties (Refuse to eat and takes >20 minutes to finish meal). No Significant association was found between level of GMFCS and feeding difficulties including (food sits in child's mouth, Child chokes or gags at mealtimes, child's eats only ground, strained or soft food and require NG feed).

Disclaimer: This article is part of thesis presented in 2019 at The University Institute of Physical Therapy, The University of Lahore.

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