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EFFECT OF NEURODEVELOPMENTAL THERAPY ON HEAD CONTROL IN CHILDREN WITH CEREBRAL PALSY

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ABSTRACT

Cerebral Palsy [CP] is a common pediatric disorder occurring in about 2 to 2-5 per 1000 live birth. An initial problem with head and oral control will generate other problems at the shoulder, trunk and pelvic girdle. Present study was carried out to find out the efficacy of Neuro developmental therapy on head control in children with cerebral palsy. Fifty children with cerebral palsy with poor head control in the age group of 5-13 month were selected. They were treated with neuro developmental approach for head control for a period of 6 weeks. The evaluation of impairment of head control was made by using gross motor functional measure scale, before treatment, after 6, 10 and 14 weeks of treatment. Out of 50 children 22 were girls, and 28 were boys'. The observation collected has been analyzed using non-parametric test to test the null- hypothesis. The performance scores of head control on the average differ significantly between the initial scores, and after 6, 10 and 14 weeks of initiating treatment. The average score improves with the increase in the duration of head control exercises. This proves the effectiveness of Neuro Developmental Therapy exercises given to cerebral palsy child.

Keywords: Cerebral Palsy, Neurodevelopment Therapy, Friedman Test

INTRODUCTION

Cerebral palsy is one of the most common disabling conditions of childhood. It is a disorder of movement and posture that is caused by a non-progressive abnormality of the developing brain **[1]**. Head control is the first sequence of developmental milestones and to initiate the sequence of movement maintains equilibrium, vision, communication and breathing pattern. Proper positioning and repetition of sensory motor information is necessary to improve child's function and maintain the normal position of head in space, and in relation to the child's body, trunk and limbs. An appropriate positioning facilitates the optimal use of existing motor skills, as well as being the most functional, practical and socially acceptable position. There are number of therapeutic approaches to treat cerebral palsy, among which neurodevelopment therapy was selected for this study. This approach inhibits the abnormal reflexes and improves the quality and control of movement which will assist to support the child in developing efficient and safe movement in gravity **[2]**.

Scherzer (1990) recognized that lack of head control is often the first sign of abnormality in children with atypical development. Thus attaining head control is a frequently used as a starting point in therapeutic intervention for children with cerebral palsy .It also enables the child to explore the environment effectively in play and to develop more advanced skills .Hence this study was initiated with the aim to analyze the efficacy of neurodevelopment therapy on head control in children with cerebral palsy **[3]**.

Method of Data Collection

Fifty children with cerebral palsy with poor head control in the age group of 5-13 month were selected. Initial evaluation included a history, physical examination and the development of gross motor function, treated with neurodevelopment approach for head control for a period of 6weeks **[4, 5]**.The evaluation of impairment of head control was functionally assessed by gross motor functional measure scale for head control before treatment, after 6, 10 and14 weeks of treatment.

Statistical Analysis of Data

The number of children taken as the sample for study is fifty to examine the effectiveness and influence of the recommended exercise for head control.

Initially, it was proposed to examine whether the exercises for head control are effective and improve the head control after 6 weeks. For this purpose the following null hypothesis has been formulated.

$$Ho = m1 = m2$$

It means that, there is no significant difference between the average score of head control before treatment and after.

Since the observations are scores and are taken on the same set of children before and after, Wilcoxson's signed Rank Test for paired observations has been used **[6, 7]**.

RESULTS AND INTERPRETATIONS

The analysis of the data and computation of test statistics give the results which are given in **Table 1**.

From this **Table 1**, it is observed that, the Z. Statistics value is Z = 6.159, with the corresponding significance value P = 0.

Hence the null hypothesis is getting rejected and so, it can be concluded that there is a significance difference between the mean scores before the treatment and after the treatment. It is also seen from the **Table 1** that the average of the scores before treatment is 16.26 and the average is 38.86, after the treatment.

Therefore the average of the scores of head control is larger after the treatment in relation to the average, before the treatment.

Therefore, it may be concluded that the activities for gaining head control are really effective and useful.

As a next step it is proposed to examine whether the duration of exercises has any influence on the level of head control achieved, namely after 6, 10 and14 weeks. Since the level of achievement is in terms of scores, a non- parametric test is used to test the null- hypothesis. The null- hypothesis to be tested is

Ho: There is no significance difference between the average levels of achievement after, different durations of head control exercises.

The test for equality of means of correlated observations namely Friedman's Test has been used. It has been examined whether the scores obtained after the three duration respectively are inter- correlated.

For this purpose, the correlation analysis has been carried out and the results are given in **Table 2**.

From this **Table 2a** of correlations it is observed that, the scores on successive occasions of test namely, 6 weeks,10 weeks,14 weeks are inter- correlated and the correlation co-efficient are significant.

It is observed that the Chi-square value is 147.95 with P = 0. It implies that the Chi-square value is highly significant and hence the null-hypothesis H_0 is rejected. Therefore the performance score of head control on the average differs significantly between the initial scores, after 6 weeks, after 10 weeks and after 14 weeks. Also, it is observed from **Table 1** is that the average initial score is 16.26. It is equal to 35.86, after 6 weeks, 45.76, after 10 weeks and 50.24 after 14 weeks. So the average score increases with the increase in the duration of head control exercises. This proves the effectiveness of the neurodevelopment exercise given to cerebral palsy children.

Table 1: Test Statistics [b]

	Y – X
Z	-6.159[a]
Asymp. Sig. (2-tailed)	P = 0.000

a: Based on positive ranks; b: Wilcoxon Signed Ranks Test

Table 2: Descriptive Statistics

	Mean	Std. Deviation	N
Initial Score	16.26	6.395	50
After 6weeks	35.86	5.518	50
After 10 weeks	45.76	4.529	50
14 weeks	50.24	1.744	50

Table 2a: Correlations

		Initial score	After6weeks	After10weeks	14weeks
Initial score	Pearson correlation	1	-.054	-.118	-.207
	Sig (2-tailed)	.	.710	.416	.149
	N	50	50	50	50
After6 weeks	Pearson correlation	-.054	1	.921**	.661**
	Sig (2-tailed)	.710	.	.000	.000
	N	50	50	50	50
After10weeks	Pearson correlation	-.118	.921**	1	1
	Sig (2-tailed)	.416	.000	.	
	N	50	50	50	
14weeks	Pearson correlation	-.207	.661**	.726**	1
	Sig (2-tailed)	.149	.000	.000	.
	N	50	50	50	50

**** Correlation is significant at the 0.01 level (2-tailed)**

Table 3: Friedman Test Ranks

	Mean Rank
Table 1Y	2.00
Table 1X3	3.08
Table 1X4	3.92
Table 1X5	1.00

Table 4: Test Statistics[a]

N	50
Chi-square	147.951
df	3
Asymp. Sig.	P = 0.000

a. Friedman Test

DISCUSSION

The study was to focus on the efficacy of neurodevelopmental therapy on head control in children with cerebral palsy. In total 50 children have been given treatment for impaired head control. Out of 50 children, 28 are boys and 22 are girls in the age group of 5-13 months. The evaluation was made by using Gross motor functional measure scale for head control before treatment, after 6, 10 and 14 weeks of treatment.

Initially, it is proposed to examine whether the exercises for head control are effective and improve the head control after 6 weeks.

The null hypothesis has been rejected, since the chi-square test statistics is found to be significant with P=0.

The average of the scores of head control is larger after the treatment in relation to the average, before the treatment. Therefore, it may be concluded that the activities for gaining head control are really effective and useful.

It is further proposed to examine whether the duration of exercise has any impact on the level of head control achieved by these children. Therefore the duration has been extended to 10 weeks and then for 14 weeks.

The pre and post treatment of head control scores for all children were statistically analyzed by using Friedman's Test. The performance score of head control on the average differs significantly between the initial score, after 6, 10 and14 weeks of treatment. Here also the null hypothesis has been rejected. Hence duration of exercises has any impact on impairment of head control.

In previous researchers, the results of current study showed a significant improvement in head control.

However the earlier therapeutic intervention is important and mandatory for these children to promote development.

CONCLUSION

From this study, it is shown that by giving Neurodevelopmental therapy for impaired head control in children with cerebral palsy is statistically proven that the average score improves with increase in the duration of head control exercises. This proves the effectiveness of Neuro Developmental Therapy exercises given to cerebral palsy child.

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