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EFFECT OF NEURODEVELOPMENTAL THERAPY ON STANDING BALANCE OF CHILDREN WITH CEREBRAL PALSY

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ABSTRACT

Postural stability is defined as the ability to maintain and control the center of mass of the body within the support base in order to prevent falls and control desired movements. Posture control is fundamental to the efficient performance of all activities of daily living and is a complex process that depends on the integration of vision, vestibular and peripheral sensations, commands of the central nervous system and neuromuscular responses, particularly muscle strength and reaction time. The control of an erect posture requires the adaptation capacity of motor responses to the mutable demands of the task at hand as well as the environment and the body itself. Deficits in posture control have been identified as the greatest limitation to the motor development of children with cerebral palsy. Cerebral palsy refers to permanent, but mutable motor development disorders stemming from a primary brain lesion, leading to secondary musculoskeletal alterations and limitations in activities. To improve postural control of the involved trunk, arm and leg, child must be active participation during treatment to achieve functional goals in standing posture. On the basis of the above Neuro developmental therapy is appropriate for children with cerebral palsy. To find out the efficacy of neuro developmental therapy on standing balance in children with cerebral palsy. Fifty three cerebral palsied children with impaired standing balance of age range between 12 months to 60 months were selected and

were treated with neuro developmental approach for standing balance for a period of six weeks. The evaluation of impairment of standing balance was made by using gross motor functional measure scale for standing balance, before treatment, after 10 weeks treatment and after 14 weeks of treatment. Out of 53 children 27 were girls and 26 were males. The observations were collected and the non-parametric test, to test the null-hypothesis, H_O : The performance scores of standing control on the average differ significantly between the initial scores, and after 6, 10 and 14 weeks of initiating treatment. As the duration of exercise increases, there is greater uniformity of achievement and hence, with the increase in the duration, of the treatment, proves to be more effective with regard to achievement in the case of all children.

Keywords: Cerebral Palsy, Neurodevelopment Therapy, Friedman Test

INTRODUCTION

According to WHO definition cerebral palsy is a permanent but not unchanging postural impairment of posture and movement resulting from non-progressive neurological disorder due to prenatal, parenatal and postnatal factors. As efficient postural control is important for the performance of voluntary skills, postural abnormalities could contribute to the delays and impairments seen in the motor skills of the child with cerebral palsy.

At the same time, abnormal postural attitudes might result from the need to cope with specific primary deficits such as poor balance control or muscle weakness, so that adaptive or substitutory postural changes will become part of the clinical picture of cerebral palsy. Hence this study was initiated with the aim to analyze the efficacy of neurodevelopment therapy on standing balance in children with cerebral palsy.

METHODOLOGY

Method of Data Collection

53 cerebral palsied children with impaired standing balance of age range between 12 months to 60 months were selected. Initial evaluation including a history, physical examination and the development of gross motor function was assessed and treated with neurodevelopment approach for standing balance for a period of 6 weeks. The evaluation of impairment of standing balance was functionally assessed by Gross Motor Functional Measure Scale for standing balance before treatment, after 6 weeks, 10 weeks, and 14 weeks of treatment.

Statistical Analysis of Data

The number of children taken as the sample for study is 53 to examine the effectiveness and influence of the recommended exercise for standing balance.

One of the interesting aspects of study is to examine the improvement in standing balance due to the duration of the treatment given to the children. It is generally an observation that the duration of training given influences the degree of improvement achieved in any characteristic attributed to the children with cerebral palsy. With view to examine the level of improvement achieved, the equality of mean scores of standing balance achieved after different durations of training is tested. To test the equality of means of several groups, the suggested statistical method is the so called analysis of variance. But here the non-parametric test namely **Friedman's test** for equality of means is used, for the following reasons.

The scores of achievement in standing balance, before training, after 6 weeks of treatment, after 10 weeks and after 14 weeks are given as scores in terms of whole numbers. Also the scores of the different durations are likely to be correlated because, the scores, measured after the previous duration are likely to be correlated with the scores, after the next duration. This is also proved statistically by computing the intercorrelation between the scores of achievement for different durations. This is given in **Table 1**.

The correlation co-efficients are all significant and so, **Friedman's test** is applied. The results of the Friedman's test obtained by analysis are given in **Table 2**.

Friedman Test

The computed value of **chi-square statistic is 153.345** with a corresponding significance value **P=0.**

Hence the null hypothesis of equality of means is rejected.

It implies that there is a significant difference between the average scores of achievement after different durations of training for standing balance. Hence, it may be concluded that, as the duration of training increases there is a significant difference in the means values of scores of achievement. This implies that the standing balance level increases when the period of training is increased. Also the mean values and standard deviations computed are given in **Table 3**.

From this table, it is observed that the average scores of achievement increases as the period of training increases. The maximum achievement is, after 14 weeks of treatment also the standard deviation decreases, when the duration of treatment increases. This implies that there is uniformity in the rate of achievement by the children, after different durations of treatment.

The standard deviation of scores is the smallest, after 14 weeks of treatment and, it may be concluded, that as the duration of exercise increases, there is greater uniformity of achievement and hence, with the increase in the duration, the treatment, proves to be more effective with regard to achievement in the case of all children.

Table 1: Correlations

	Table1X2	Table1X1	Table1X3	Table1X4
Table1X2 Pearson Correlation	1	.992**	.954**	.558**
Sig. [2-tailed]		.000	.000	.000
N	53	53	53	53
Table1X1 PearsonCorrelation	.992**	1	.937**	.540**
Sig. [2-tailed]	.000		.000	.000
N	53	53	53	53
Table1X3 Pearson Correlation	.954**	.937**	1	.641**
Sig. [2-tailed]	.000	.000		.000
N	53	53	53	53
Table1X4 Pearson Correlation	.558**	.540**	.641**	1
Sig. [2-tailed]	.000	.000	.000	
N	53	53	53	53

****Correlation is Significant at the 0.01 Level [2-Tailed]**

Table 2: Ranks

	Mean Rank
Table 1X1	1.00
Table1X2	2.04
Table1X3	3.16
Table1X4	3.80

Test Statistics [a]

N	53
Chi-Square	153.345
df	3
Asymp.Sig.	.000

a. Friedman Test

Table 3: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std.Deviation
Table1X1	53	6.00	37.00	18.3019	8.70364
Table 1X2	53	12.00	39.00	25.0189	8.29386
Table1X3	53	22.00	39.00	33.1132	6.01172
Table1X4	53	35.00	39.00	38.6604	.85358
Valid N [list wise]	53				

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