ORIGINAL RESEARCH PAPER

Volume-7 | Issue-3 | March-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

EFFECT OF SUSPENSION THERAPY TO IMPROVE TRUNK CONTROL IN HYPOTONIC CEREBRAL PALSY CHILDREN.

Physiotherapy

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ABSTRACT

Background: Impaired trunk control has common incidence in cerebral palsy. It is associated with loss of postural control. Which indirectly affects the ability to maintain the balance in sitting and standing positions. These findings highlight the magnitude of problem of poor trunk control in cerebral palsy.

Objective: Effect of Suspension Therapy to Improve Trunk Control in Hypotonic Cerebral Palsy children

Methodology: Total of 20 subjects of the age group 5-10 years were randomly allocated in study. All subjects received the intervention for 5 times/week, for 4 weeks. Assessment of trunk control was recorded by Trunk Control Measurement Scale and Gross Motor Function Measure-66.

Results: There was significant difference in trunk control after 4 weeks of intervention. Data was analysed by paired t test and results recorded were extremely significant.

Conclusion: Suspension therapy is highly effective in the improvement of trunk control of hypotonic cerebral palsy children.

KEYWORDS

Cerebral Palsy, Hypotonia, Trunk Control, Suspension Therapy

1. Introduction

Cerebral palsy is known to be a primary disorder of movement and posture .In Cerebral palsy the clinical pattern of presentation may change with time due to developmental plasticity, growth and maturation of the Central Nervous System.[1]The Incidence of cerebral palsy is 2 to 2.5 per 1000 live births.[1] Based on type of neuromuscular deficit cerebral palsy is classified into Spastic, Dyskinetic, Ataxic, Hypotonic and Mixed[1] Hypotonic cerebral palsy children have weak head control, weakness in trunk stabilization and control, insufficiency of correction , equilibrium and protective reactions , joint hypermo bility.[2]It can affect control of limbs, head, trunk and overall posture.[3]

The trunk plays a vital role in the organization of postural reactions. The primary function of the trunk muscles is to stabilize the spine and trunk.

The stabilization of the spine and trunk is essential for free and selective movements of the head and the extremities.[4] Trunk is the central key point of the body. Proximal trunk control is essential for control of distal limb movement, balance and functional activities as well as it plays crucial role in functional movement by preparing the body for the motion of the extremities against gravity.[3,5] Any change in the movement of the body segments leads to change in the location of the Centre of Mass of the body.[6]

Poor postural control can cause secondary compensation by other muscles to assist in providing postural stability, reducing the effectiveness of muscles that typically function as primary movers of the extremities[7] Various biomechanical problems makes it difficult for the head and trunk to be controlled in sitting and standing position and also affects the ability of the balance which is caused by compensatory mechanism of the postural control.[8] Suspension is the means whereby parts of the body are supported with slings and elevated by the use of variable length ropes fixed.[9] A sling exercise can enhance stability, maintain co-contraction of trunk muscles, and thereby improve postural stability of the deep trunk musculature.[10]

Previous study shows the sling based exercises are helpful for impaired trunk control in infants having spastic cerebral palsy. But same intervention is not yet proved specifically in hypotonic cerebral palsy children.

2. Methodology

Subjects fulfilling the inclusion criteria were included in this study and others were excluded. Informed assent was taken from parents or caregivers and a verbal consent was taken from every subject prior to participation. Mean age of subjects included in study was 4.526. Both females and males were included.

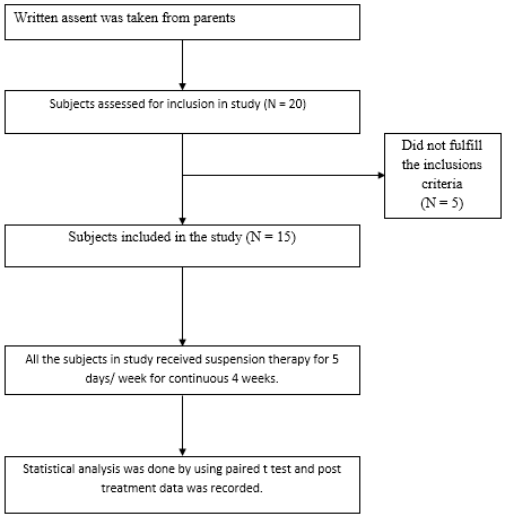
Baseline assessment was done with Trunk control Measurement scale and Gross Motor Function Measure 66. All the subjects received suspension therapy as an intervention. Each treatment session was of 30 minutes. Treatment was given for 5 days in a week for continuous 4 weeks.

Following positions were given with the help of suspension frame and slings for treatment to improve trunk control.

1. High sitting
2. Side sitting
3. Kneeling
4. Quadripod

Trunk flexion, extension, side flexion and rotation were maintained in all these positions with the support provided by therapist for 10 seconds and gradually time was increased but treatment was carried without support.

Post treatment data was recorded at the end of 4th week with both of the outcome measures and statistical analysis was done.



3. Results and Discussion

3.1 Comparison of effect; Trunk Control Measurement Scale

Variables	Mean	SD	Mean Difference	P value
TCMS Pre	19.2	7.166	11.53	<0.0001
Post	30.73	8.11		ES

Table 3.1 shows comparison of pre and post effect of suspension therapy by Trunk Control Measurement Scale. In this study pre interventional mean and standard deviation was 19.2 +7.166 and post interventional mean and SD was 30.73+8.11 with mean difference of 11.53

3.2 Comparison of Effect; Gross Motor Function Measure-66

Variables	Mean	SD	Mean Difference	P value
GMFM Pre Post	44.98	14.39	19.01	<0.0001
	63.99	14.44		ES

Table 3.2 shows comparison of pre and post effect of suspension therapy by Gross Motor Function Measure-66. Pre interventional mean and standard deviation was 44.98 +14.39 and post interventional mean and SD was 63.99+14.44 with mean difference of 19.01.

Dissucion

Cerebral Palsy is a non-progressive neuro developmental disorder that includes a wide spectrum of symptoms related to the early onset of posture and motor impairment.[11]It causes activity limitations that are attributed to non progressive disturbances that occurred in the developing fetal or infant brain. In Cerebral Palsy, abnormal posture and loss of selective motor control, poor trunk control and balance which contributes to poor postural control with limited activities of daily living. To execute functional activities, trunk control is required to stable base of support.[11]

Children with cerebral palsy have weak trunk control which makes other muscles to maintain stability of posture. There is difficulty for head and trunk to be controlled in sitting and standing due to various biomechanical problems. For activity and participation stability of trunk muscle is required.[8] Challenge for physiotherapist is to improve trunk control and its impacts on personal and social life of a child and parents also.

Studies have shown that a sling exercise enhance deep muscles which maintain co-contraction of trunk muscles to improve stability and postural stability[8]According to previous studies, sling exercise can be useful to improve trunk control and is considered supplementary treatment strategy for children having various neurological disorders.

Suspension Therapy is the means whereby parts of the body are supported in slings and elevated by the use of variable length ropes fixed to a point above the body. There are three types of suspension frame axial, pendular and vertical.[9]

In the present study we focused on sling exercise as a key treatment strategy and are used for severe loss of trunk control in case of hypotonic cerebral palsy children. In this vertical type of suspension is used to improve trunk control.

The aim of the study was to find the effect of suspension therapy to improve trunk control in hypotonic cerebral palsy children of age group between 5 to 10 years. We hypothesized that significant improvement in outcome measure will be observed after the treatment of sling exercise.

Subjects were included according to inclusion criteria. Both males and females were included. (Males were 7 and females were 8) Mean Age of subjects included in study was 4.526 .The suspension therapy was given to the subjects for 20 days (5 days per week for continuous 4 weeks).

Baseline data was collected, intervention was given for 4 weeks and post treatment data was collected. According to Trunk Control Measurement Scale and Gross Motor Function Measure 66, there was significant improvement in trunk control after an entire treatment programme. Suspension therapy significantly improved trunk control in hypotonic cerebral palsy children. Extremely significant improvement was noted

1. Conclusion

Suspension Therapy is highly effective in the improvement of trunk control of hypotonic cerebral palsy children

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