



ORIGINAL RESEARCH PAPER

Physiotherapy

EFFECTIVENESS OF BEHAVIOR THERAPY ON DROOLING IN CHILDREN WITH SPASTIC CEREBRAL PALSY

KEY WORDS: Cerebral palsy, Drooling, Oromotor interventions, behavior therapy

Sayali Gijare*	Dept. of Pediatrics, Faculty of Physiotherapy, KIMS, Dhebewadi Road Malkapur, 415539 (Karad), India *Corresponding Author
Sneha Suresh	Dept. of Cardiopulmonary Sciences, Faculty of Physiotherapy, Vikas College of Physiotherapy, Mangalore 575008, India
Mandar Malawade	Dept. of Pediatrics, Faculty of Physiotherapy, KIMS, Dhebewadi Road Malkapur, 415539 (Karad), India

ABSTRACT

Background: Drooling is a common associated problem in cerebral palsy. With the prevalence of 40%, drooling is important co morbidity in cerebral palsy. Poor oromotor function is associated with drooling. These findings highlight the magnitude of the problem of drooling in cerebral palsy.

Objective: To determine the effectiveness of oromotor interventions on drooling and the effects of combined oromotor interventions and behavior therapy on drooling.

Methods: 40 cerebral palsy children who fulfilling the selection criteria were selected and were divided into two groups by using block randomization. Controlled group received conventional oromotor interventions and the experimental group received both oromotor interventions and behavior therapy both together. Impact of drooling was assessed by using Drooling Impact Scale before and finally after 4 weeks of interventions.

Results: Mean difference of score of Drooling Impact Scale in controlled group on baseline and after intervention of one month is 14.65 which shows highly significant difference and that of experimental group is 22.90 which is considered as highly significant difference. Comparison between the controlled and experimental group shows highly significant difference in percentage after 1 month of intervention. (Controlled group 22.33% and experimental group 33.63%)

Conclusion: Combination of oromotor interventions and behavior therapy is more beneficial to reduce drooling in cerebral palsy children.

1. INTRODUCTION

"Cerebral palsy describes a group of permanent disorders of the development of movement and posture, causing activity limitations that are attributed to non-progressive disturbances that occurred in the developing fetal or infant brain. The motor disorders of cerebral palsy are often accompanied by disturbances of sensation, perception, cognition, communication and behavior, by epilepsy and by secondary musculoskeletal problems."(1) Worldwide incidence of CP is 2-2.25/1000 birth, males have been found to have a higher prevalence of CP than females.(2) Approximately 50% of children with CP have some degree of cognitive impairment, and seizures and impairment of sensory modalities such as hearing, vision, pain, and touch are common. Oromotor dysfunction, communication impairment, and excessive drooling are also often reported in children with cerebral palsy. (1)

Drooling is defined as salivary incontinence or the involuntary spillage of saliva over the lower lip.(3) It is a significant social problem, potentially leading to loss of self-esteem and social isolation.(4) Drooling is normal in infants but it usually stops by 15-18 months of age. After the age of 04 years it is considered as abnormal.(3,4,5,6,7) Drooling is a common problem in cerebral palsy.(8) In drooling usually secretion rate is normal but due to the inability to coordinate and improper control of the oral muscles and tongue, oral secretions accumulate in the oral cavity and lead to the pouring.(9)

Risk of social rejection, constant soiled clothing, unpleasant odor, irritated facial skin, Perioral and oral mouth infections, Dehydration, Impaired masticatory function, Interference with speech, Damage to books, communication aids, electronic communication devices, computers, audio equipments, social isolation are the few reported side effects of drooling.(10)

With the prevalence of 40%, drooling is important co morbidity in cerebral palsy. Poor oromotor function is associated with drooling.(5)

Oromotor intervention is the basic, conventional and fundamental treatment used for drooling among the pediatric population. Main focus of oromotor therapy is in on mandibular stability, lip closure, better tongue position, and swallowing. (11)

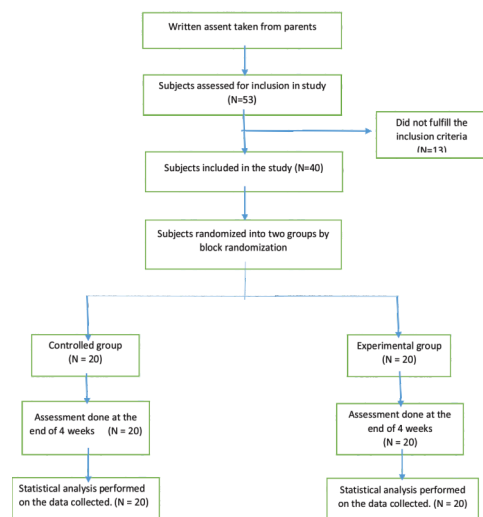
Behavior therapy involves teaching the child to recognize the feeling of wetness and be able to either swallow more frequently or wipe the saliva from the lips and chin. It can also include assisting the child to develop lip closure and saliva suction.

Developing the ability to suck up the secretions in the mouth using straws having different thicknesses, and liquids of varying consistencies are few of the strategies.(4)

Previous evidence based systematic review shows that there is insufficient evidence to determine the effect of oromotor interventions alone on children with oromotor deficits and swallowing problems. But there is no literature available showing the combination of behavior therapy and oromotor interventions are useful in reducing drooling(12)

2. METHODOLOGY

After getting approval from scientific committee and college ethical committee, study was conducted on the subjects of age 4-10 years with spastic cerebral palsy. All parents and caregivers were asked to sign the written assent form. Forty subjects of both genders from the age of 04-10 years were screened for inclusion and exclusion criteria by using Drooling Severity Scale as a prescreening assessment tool. Before intervention, subjects were randomized into controlled group (group 1) and experimental group (group 2) by block randomization method. Prior to treatment, baseline data was collected by using Drooling Impact Scale, which is a caregiver questionnaire.



3. RESULTS AND DISCUSSION

Table 3.1: Comparison within the controlled and experimental group

Group	Mean	Std. deviation	Mean difference	SD of difference	Change	p value
Controlled Pre	65.60	12.26	14.65	7.96	22.33 %	0.000 <0.001 HS
Post	50.95	14.22				
Experimental Pre	68.10	9.05	22.90	7.55	33.63 %	0.000 <0.001 HS
Post	45.20	10.15				

Comparison within controlled and experimental groups. In controlled group, mean difference of the pre and post test score was 14.65 with standard deviation of 7.96. In experimental group, mean difference of the pre and post test score was 22.90 with standard deviation of 7.55 which suggests high significance.

Table 3.2: Comparison between the controlled and experimental group

Group	Mean	SD of difference	Change	p Value
Controlled group	14.65	7.96	22.33 %	0.002 HS
Experimental group	22.90	7.55	33.63 %	

Comparison between controlled and experimental group. Mean difference in controlled group was 14.65 with standard deviation of 7.96. Change in percentage after intervention was 22.33. Mean difference in experimental group was 22.90 with standard deviation of 7.55. Change in percentage after intervention was 33.63 which suggests high significance.

DISCUSSION

Cerebral palsy is a group of permanent disorders of the development of movement and posture. It causes activity limitations that are attributed to non-progressive disturbances that occurred in the developing fetal or infant brain. Worldwide incidence of CP are 2-2.25/1000 birth, males have been found to have a higher prevalence of CP than females.(2) Oromotor dysfunction, communication impairment, and excessive drooling are also often reported in children with cerebral palsy. (1)

Drooling is a significant social problem, potentially leading to loss of self-esteem and social isolation. (4) In case of cerebral palsy, there may be a lack of appreciation of external salivary loss, intra-oral sensory dysfunction, intra-oral motor impairment or a combination of these factors.(4) Drooling is more commonly associated with dysfunction of the oral phase of the swallowing with inadequate lip closure, disorganized tongue movements exacerbated by lack of oral and perioral sensory perception, head-down posture, reduced frequency of swallowing and dysphasia. (8) Drooling can be distressing for children, as well as for their parents and caregivers.(8)

The challenge for physiotherapist is to minimize drooling and its impacts on personal and social life of a child and parents also. Studies have shown that Oromotor intervention is the basic, conventional and fundamental treatment used for drooling among the pediatric population. Main focus of oromotor therapy is in on mandibular stability, lip closure, better tongue position, and swallowing. According to previous studies, behavior therapy can be useful to control the minimal amount of drooling present drooling and is considered as a supplementary treatment strategy for children having various neurological disorders.(11)

In the present study we have focused on behavior therapy as a key treatment strategy and is used for severe drooling in case of spastic cerebral palsy children. It is combined with the conventional treatment i.e. oromotor interventions and given as a combination therapy to the experimental group in the study.

The aim of this study was to determine the combined effect of oromotor interventions and behavior therapy against oromotor

interventions alone on drooling in spastic cerebral palsy children of age between 04-10 years. We hypothesized that significant improvement in outcome measure will be observed after the combined treatment of behavior therapy and oromotor interventions between the experimental and controlled group.

Oral-motor intervention involved different exercises and activities to improve strength of the oral and facial muscles, to improve oral-motor skills (lip mobility, tongue mobility, and jaw stability), to improve lip closure, to normalize oral sensitivity and awareness, and to improve saliva swallowing.(13,14,15) It helped to improve oral motor control, sensory awareness and frequency of swallowing including different techniques which improve muscle tone and saliva control.

Behavior therapy involved teaching the child to recognize the feeling of wetness and be able to either swallow more frequently or wipe the saliva from the lips and chin. It also involved encouraging the child to develop lip closure and saliva suction.(4) Strategies were developing the ability to suck up the secretions in the mouth using straws having different thicknesses, and liquids of varying consistencies.(4)

In controlled group significant effect was seen with mean difference of the pre and post test score was 14.65 with standard deviation of 7.96 Children in the experimental group showed significant effect with, mean difference of the pre and post test score was 22.90 with standard deviation of 7.55 Conventional therapy was beneficial in reducing the rate of drooling but combination of conventional treatment with behavior therapy was more significant. Hence it was concluded that combination of oromotor interventions and behavior therapy is highly significant in reducing drooling and its impacts on personal and social life of a child.

However the results are showing significant difference in impact of drooling, there is a lack of specific criteria to indicate child's poor performance to maintain good posture and initiate swallowing. Despite of this limitation, assessment and management of drooling is useful in clinical practice. Further research need to be done to assess effectiveness of each treatment strategy described in the study on various pediatric populations. The limitations of this study were lack of follow up and small sample size.

4. CONCLUSION

Combination of Behavior therapy and oromotor interventions shows a highly significant effect on impacts of drooling as compared with oromotor interventions alone.

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