

Effectiveness of Standing Frame on Constipation in Children with Cerebral Palsy

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Abstract

Background: The effectiveness of standing frame has been investigated in cerebral palsy patients. The present study examine that stading frame was effective or not on constipation in cerebral palsy patient. The study is randomized controlled trial (RCT), enrolled 30 patients with cerebral palsy. All pateints received a standing frame programme, for 8 weeks 5 days a week. Main measures: Bristol stool chart and questionnaire on burden of care. **Result:** the result calculated individually by the scales. For Bristol stool chart 43.3% of the stool evacuated falls into type 2 in week 1 and 46.7% of stool evacuated in type 3 ($p = 0.000$) there was a significant difference. Regarding the questionnaire on burden of care table for que. 1 ($p = 0.001$), Que. 2.1 ($p = 0.002$), que 2.2 ($p = 0.000$), que 2.3 ($p = 0.002$), que 3 ($p = 0.001$) there shows significant difference and for que 4 ($p = 0.317$) were there is no significant difference finding. **Conclusion:** this study found the beneficial effects of standing frame for the management of constipation in cerebral palsy patient.

Keywords: cerebral palsy; constipation; standing frame.

Introduction

Cerebral palsy is a static neurological condition resulting from brain injury that occurs before cerebral development is complete because brain development continues during the first two years of life [1]. It is a broad term used for variety of non progressive motor signs [2]. Arising from an injury that prevents the full development of the central nervous system in utero [3]. It is characterized by the inability to control motor function [11], and affects the childs ability to explore, speak, learn, and become independent. Motor manifolds associated with sensory symptoms, intellectual deficits, and diseases of the digestive tract and other systems [4,5]. Children with severe

generalized cerebral palsy (CP) often experience comorbidities, Among which constipation is common [6].

Constipation can be defined according to the Roma III criteria and the diagnosis is established by the presence of two or, more of the following symptoms: fever than three evacuation per week at least one episode of fecal incontinence weekly if the child already presents control of sphincter. Almost all children with quadriplegia or severe diplegia show intrinestiic problems that limits their function and quality of life. Constipation is probably caused by the neurological abnormalities of the digestive system control and it might also be due to the limited mobility [3,11,12,13].

Methods

A total no. of 30 subjects of sex aged 3 to 17 yrs (23 males and 7 feamles) were recruited by random sampling method on basis of fulfillment of inclusion and exclusion criteria. The study is conducted in physiotherapy department of santosh medical college, hospital. The duration of the study is 8 weeks 5 days a week with the use of standing frame. To monitor the effects of the standing frame we measured the outcomes with the Bristol stool scale and questionnaire on burden of care.

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Outcome Measures

Bristol stool scale – the scale allow to identify the stools using seven different images with accompanying written descriptors. The scores is widely used in order to verify the presence of a constipation [7,8,9].

Questionnaire on burden of care – it is used in collection data regarding the burden on caregivers due to to the evacuation management and to test the load on caregivers of children with cerebral palsy (CP) using the four- category rating scale [10].

Procedure

Prior to testing subjects were received and caregivers were asked to signed a consent form approved by santsoh medical college.

Initial testing included all the demographics of the subjects. Subjects caregiver were interviewed to ask if any prior injury history or any other health problem. Reading were calculated in pre and post weeks. Week 1 and week 8. The subjects was participated to stand on standing frame for 60 min daily for 8 weeks. The treatment usually took place at morning hours. During the ongoing treatment the subject was instructed to report any kind of symptoms or discomfort feeling. After 8 weeks of daily standing on standing frame the readings were re assessed on the basis of Bristol stool scale and questionnaire on burden of care.

Data Analysis

Descriptive statistics (mean and standard deviation) were computed for all relevant variables and their respective confidence interval of 95% was analysed using statistical package for social sciences (SPSS) version 17. The independent variable is standing frame and dependent variables are Bristol stool chart and questionnaire on burden of care. Wilcoxon signed rank test is non parametric statistical hypothesis test used in samples.

Result

A total no. of convinent subjects of either sex age of 3 to 17 yrs were recruited and randomized. The pre and post of week 1 and week 8 was done. The study took place on standing frame to check the effectiveness. The outcome measures by using Bristol stool scale and questionnaire of burden on care.

Data collected from the initial questionnaire told us about the subject habitual evacuation frequency and which was different in every single subject and it was also necessary for some subject to induce the evacuation by stimulation, an enema associated to a facilitative posture, because he/she could not evacuate spontaneously. Frequency (%) 43.3% of the stool evacuated falls into the Type 2 class of Bristol stool scale in week 1 and in week 8 frequency (%) 46.7% of the stool evacuated falls into Type 3 class. So the p value is (≤ 0.000) and test value is (4.34) which shows the significant effect of standing frame. Regarding the questionnaire on burden of care table, The daily load due to the management of the evacuation was 4 (a lot) as per the rating scale during the week 1 and it was decreased to 3 (moderate) as per rating scale in week 8. The p value is (< 0.001) and test value is (3.46). The financial cost of the stimulation were minimal in both week 1 and week 8. So the p value is (<0.002) and test value is (3.16). The impact on the care giver due to the time spent doing the stimulation and the discomfort decreased by one and two points, respectively. The P value for both is (<0.000) and (<0.002) and test value for both is (3.74) and (3.16). Notably, the discomfort was totally eliminated when the subject started to use the standing frame. The physical fatigue due to the management of evacuation changes from 4 (a lot) in week 1 to 3 (moderate) in week 8. The p value is (<0.001) and test value is (3.31).

Discussion

The constipation among cerebral palsy children is more common and a reason to worry as they suffer from highly reduced mobility and consequent constipation. The assumption is there that upright position may facilitates intestinal transit although the present study supports this fact. The reason of this further study was done to determine the effects of standing frame on evacuation, and to study the characteristics of stool. And it is the common opinion among expert that the standing frame can be beneficial in number of areas in internal medicine, because it shows now the significant effect on gastrointestinal function.

The inability to pass a stool or have a bowel movement as often or as easily as one would like. It usually involves the difficult passage of dry, hard, and or painful stools, no matter how often. The involvement of constipation in cerebral palsy is when these signs and symptoms occurs like infrequent and incomplete bowel movement, hard,

ball shaped stools (may be very large or like “rabbit pellets”), pain and sometimes bleeding when having a bowel movement, abdominal pain or distention, diarrhea, “leaking or skid marks” in underwear, irritability or other unexplained change in behaviour, poor appetite, gasrtroesophageal reflux.

Children with A typical skeletal muscle tone and poor coordination of the muscles around their anus, such as children with cerebral palsy, stool may stay in the colon longer in children with cerebral palsy because their abnormal tone does not let the bowel work right.

Not being able to get in upright position, squatting position make it harder to push the stool out of the rectum. Poor sitting position make it hard for the intestine to work right because it is too crowded. Not being in the upright position throughout the day and not working around enough also make it harder to have a bowel movement.

Because of the poor coordination some children know they have to have a bowel movement, but due to the poor coordination or communication deficit or inability to express they do not want to do and due to this reason stool build up and cause the colon to become too big. Prolonged periods of constipation can lead to impaction (a blockage of the colon by large amounts of stool) that also can stretch the colon, known as mega colon. The muscle of mega colon does not work right, which make it hard to pass a bowel movement. Children with mega colons do not feel the need to have a bowel movement.

Involving a child into the standing position and to upright position of a gastrocolic reflex which can only be achieved by using standing frame it helps in moving the stool through the colon.

The results of this study support the hypothesis that the use of the standing frame in children with CP and quadriplegia or severe diplegia has significant effects on constipation, well it permits lower extremity weight-bearing, which increases muscle strength and postural control. At the same time, weight-bearing activites improves the physiological status of the gastrotntestinal system. The reason for constipation among cerebral palsy children is some how the lack of mobility or lack of postural change. The controlled activity or performing least activity cause the GI system to function less. A common problem in neurologically impaired children and a manifestation of a probable underlying defect in gut innervation. A contributory factor to undernutrition intake are widely accepted as a risk factor of constipation.

The daily use of this device improves the frequency of spontaneous evacuation happened with minimal or without any kind of induction. On the basis of this data, we can presume a positive effect between the habitual use of the standing frame and the improvement in the intestinal transit. However, we cannot postulate the timely effect of verticalization because spontaneous evacuation occurred at various times of the day, whereas the device was always used during the morning. During the study, not to be underestimated was a noticeable reduction in the pain felt by the child due to constipation and/or evacuation, as reported by the principal caregiver (spontaneous moaning, crying and facial grimaces). our data strongly suggest that the use of the standing frame might have increased both these important outcomes, as well as the level of participation in meaningful activities. We hypothesized that the use of the standing frame would induce a noticeable change of the type of stool, because the improvement of the intestinal stasis.

Finally, on the basis of the questionnarie we noticed that the burden on the parents decreased with the introduction of the standing frame and reported discomfort was totally eliminated.

Conclusion

This study found the benificial effects of standing frame for the treatment of constipation in quadriplegic or severe diplegic children with cerebral palsy (CP). hence, the regular use of standing frame decreases the level of constipation suffered by the children and therefore it can be the choice of treatment for cerebral plasy children.

Appendix

Questionnaire on Burden of Care

Que. No. 1. How much is the daily load due to the management of your child’s evacuation?

Que. No. 2.1. How much is the impact on you about:the financial cost of the stimulation?

Que. No. 2.2. How much is the impact on you about:the time spent doing the stimulation?

Que. No. 2.3. How much is the impact on you about:the uneasiness caused by the discomfort of your child during the stimulation?

Que. No. 3. How much is your physical fatigue due to the management of the evacuation?

Que. No. 4. How much is your physical fatigue due to the management of the diaper change?
 (if your child uses diaper)
 1 - not at all, 2 - minimal , 3 - moderate , 4 - a lot.

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