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EFFECT OF ATTENTION ON GAIT PARAMETERS OF CHILDREN WITH CEREBRAL PALSY

(SPASTIC DIPLEGICS)

Authors

Poonam Sachdev,
Lecturer in Occupational Therapy,

Dr. Aruna Ravipati
Ex. Lecturer in Physiotherapy

Composite Regional Centre for Skill Development, Rehabilitation and Empowerment of Persons with Disabilities (CRC) – Bhopal, India

Abstract: To study the effect of attention on step length, width of walking and cadence in children with cerebral palsy- spastic diplegic. 20 children having cerebral palsy aged 5 to 10yrs who initiated independent walking were studied at composite regional centre for persons with disabilities Bhopal. Children underwent initial assessment for gait parameters in a calm environment. Later reassessment in the same environment was done but the subjects were asked to concentrate on their balance during gait. A third assessment was done in the same environment with an input of instrumental music, wherein children were asked to listen to the music while walking. Gait parameters were recorded. ANOVA was done to compare the findings of three assessments. No significant difference was found between first & second assessments with $p>0.05$. Significant difference with $p=0.03$ was found between 2nd and 3rd assessments. Step length reduced, width of walking and cadence increased when attention was distracted. Attention is an important factor that influences gait during initial phases of learning. Automatisation of motor skills is crucial during training of motor skills.

Keywords: Cerebral Palsy, Spastic Diplegia, Gait Parameters, Attention, Motor Control, Rehabilitation

INTRODUCTION

Normal human gait involves a high coordination between Neuro- muscular and Musculo- skeletal system of the body. Various parts of nervous system function with mutual synergy during normal human walking .Awareness of Surrounding, orientation, motor planning and Voluntary control are necessary during. Locomotion while learning any motor act automatisation is essential for perfection. Performance of a motor act during the initial phases of learning is related to attention during performance. The study concentrates on the importance of attention during performance of walking in initial phase and importance of automotisation.

REVIEW OF LITERATURE

Chiung – Yu-cho, et al compared the effects of two different cognitive tasks (an attention tasks and a memory task) on unrestricted fast walking and on narrow path walking. He reported that performance on a secondary task deteriorates when either young or old adults performs a demanding balance tasks. Overall there was a significant difference in gait speed between the single and dual task conditions.

METHODOLOGY

20 Children aged 5 to 10 years having cerebral palsy with diplegic type were selected for the study form the registration counter of Composite Regional Centre for Persons with Disabilities, Bhopal of the year 2007. Cases under Anti epileptic drugs and any sort of surgical corrections during the past 3 months and cases were excluded from the study. No therapeutic intervention was given to the subjects selected for this study. The children underwent the initial assessment for gait parameters in a calm environment.

The assessment included the following components.

1) Step length
2) Width of walking base
3) Cadence

Second assessment was done in the same environment but subjects concentrating on their balance during gait. A rest period of half hour is given between the individual trials. This was done by verbal commands and cues given by the same therapist for all children. The verbal commands were given only for maintaining balance and avoiding falls. The variables were measured for gait. The same children were made to walk in the same environment with an input of instrumental music, wherein children were asked to listen to the music with concentration during walking. Gait parameters were recorded during this third trial.

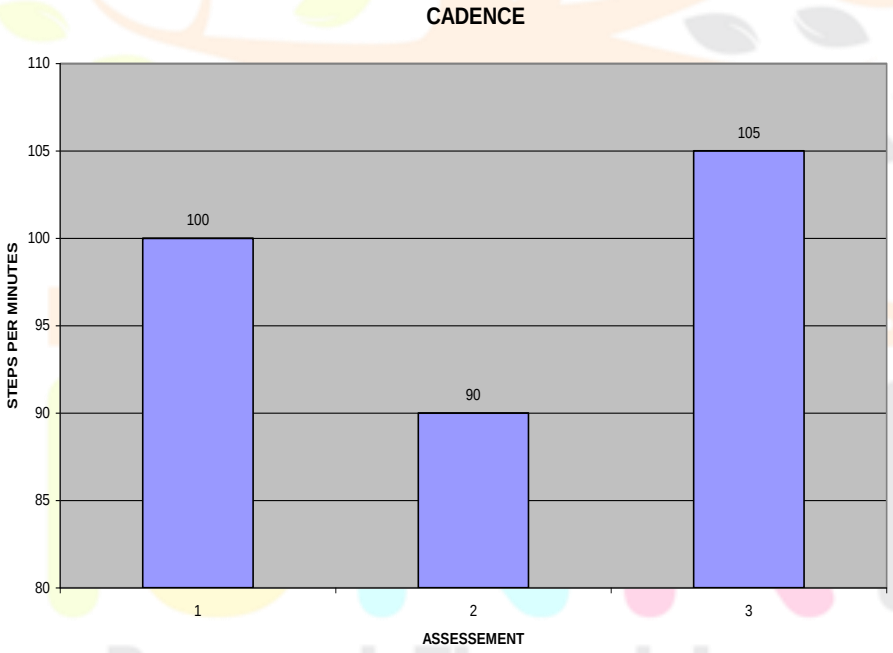
MEASURING TOOLS

Measuring tape, ink, paper and stop clock,

DATA ANALYSIS

ANOVA (Analysis of Variance) was used as a statistical test to compare the findings of three assessments using SPSS software. The three variables were compared for finding difference between the three assessments.

GRAPHICAL REPRESENTATION



RESULTS & DISCUSSIONS

No Significant difference was found between 1 and 2 Assessment with P>0.05. Significant difference was found between 2 and 3 assessments with P = 0.03 for step length P = 0.05 width of walking base and P= 0.002 for cadence. Step length reduced, width of walking base and cadence increased, when attention was distracted.

Gait requires cognitive resources for planning and execution. Gait performance decreases in children if cognitive load increases. These especially in the initial stages of learning the input are under greater demand. When the attention is diverted or divided these cognitive resources are distributed to the two tasks and hence insufficient to gain perfection in the individual tasks. This effect subsides after gaining automotisation of individual motor task. Hence a child may walk undisturbed in spite of environmental disturbances when walking is completely achieved. It is found that when a motor task is adequately learned the dedicated attentional resources are low which allows a second task to be applied concurrently.

CONCLUSION

It was observed from the study that walking style is better when children concentrate on the task of walking till their gait eventually becomes an automatic task. It can be enforced that attention is necessary for the children with cerebral palsy to walk properly during the phase when the child is learning to walk. This inference emphasizes on training for automatic movement which comes only by constant practice. Perfection in walking helps the children with cerebral palsy to do daily living more independently and effectively. This research study will suggest more effective rehabilitation strategies for early rehabilitation.

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