

**Title :** The effects of passive vestibular therapy using vestibular stimulator on balance in children with Cerebral Palsy

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### **Background and Objectives:**

Postural control dysfunction is a serious problem in children with cerebral palsy, and the vestibular system is known to play an important role. This Randomized Control Trial study with blinded evaluator was conducted to examine the effect of vestibular intervention on static balance in school aged (7-12 years) brain injured children. A special device based on ergonomics concern was redesigned and redeveloped called Vestibular Stimulator in the University of Social Welfare and Rehabilitation Sciences, Tehran, to stimulate vestibular organ passively in different directions with a digitally controlled speed. The effectiveness of vestibular stimulation was studied in a group of children with CP.

### **Methods:**

Fifty two children with Spastic CP with 1-2 level of Gross Motor Function Classification System (GMFCS) aged 7-12 years were enrolled and randomly assigned in to two groups: control and intervention. Berg and Bruniniks-Oserstsky Test of Motor Proficiency II (BOT II) and Force Plate (during eyes closed and open) were measured functional and laboratory parameters of balance changes, respectively. Participants at intervention group received passive vestibular stimulation using vestibular stimulator for 20 minutes and traditional Occupational Therapy (OT) program for 40 minutes. Children in control group received traditional OT program for 60 minutes. Interventions were provided 3 times /week for 6 weeks. Participants assessed at three stages: after, before and 8 weeks after intervention. Data analyzed by "Repeated Measure ANOVA.

### **Results:**

The passive intervention significantly increased Berg scores ( $p=0/006$ ), decreased the area ( $P=0.025$ ) and the range of Center of Pressure displacement in Anterior-Posterior plan during eyes closed ( $P=0.047$ ).

### **Conclusion:**

This study showed that passive stimulation using vestibular stimulator can improve some balance parameters in children with Spastic CP. It may be related to re-organization of vestibular system with controlled and precise application of stimuli.