Vestibular Stimulation in Children with Cerebral Palsy

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Introduction/Background

- Balance
  - Visual system
  - Proprioceptive information
  - Vestibular system
  - Somatosensory
- Good sensory integration → better balance
- Vestibular system plays a role in:
  - postural control
  - motor development
Introduction/ Background

- Children with Cerebral Palsy (CP) may have:
  - Dysfunctional postural control
  - Dysfunctional movement patterns
  - Limits in participation for activities

- Current conventional treatment
  - Traditional physical therapy
  - Vojta method
  - Neurodevelopment treatment
  - Sensory integration
  - Sensory motor development
PICO Question

• Will children with cerebral palsy have better outcomes regarding balance and center of pressure with vestibular stimulation rather than conventional therapy?
Methods

- **Databases:** Medline, CINHAL, PubMED, Google Scholar
- **Terms searched:** Vestibular stimulation, cerebral palsy, balance function, children
- **Number of articles found:** 23
Research Synthesized

• 1 Case study
• 1 Cohort study
• 2 Randomized control trials
Results

• Improved mental and motor scores
  – increased sitting balance

• Faster reactions to center of pressure displacement
  – increase in velocity parameters

• Postural stability and gross motor age are significantly correlated
  – eyes-closed condition

• Vestibular stimulation improved
  – functional outcomes
  – dynamic and static balance
Discussion

- Using a swing as vestibular input improved postural control\(^3\)
- Implementing postural control with somatosensory and vestibular feedback\(^2\)
- Increases in velocity parameters lead to increase reactions and ability to manage perturbations.\(^1\)
- Vestibular training can improve static and dynamic balance\(^4\)
Areas for Future Research

• Training with eyes closed condition can improve gross motor function \(^2\)
• Assess the effects of head and neck position on vestibular training and on postural positioning \(^1,^4\)
• Is linear or circular vestibular stimulation more effective? \(^1\)
• Test swing protocol with larger population \(^3\)
• Remove cognitive factors associated with object fixation during vestibular stimulation \(^4\)
References


