

Case Report: The AtaxiTog System As An Adjunct To Traditional Physical Therapy Intervention For A 13-Year-Old With Postural Instability Post Non-Traumatic Cerebellar Injury; A Five-Week Program.

Ashley Sefecka, PT, DPT, NYU Langone Medical Center

BACKGROUND AND PURPOSE:

Cerebellar insults can drastically impact the ability to perform motor tasks. If the cerebellum is compromised through injury or disease, deficits relating to posture and movement such as ataxia, dysmetria, decreased muscle tone, decreased balance, and poor postural control will occur.¹ Traditional interventions to improve postural control resulting from cerebellar damage include strengthening of proximal musculature with emphasis on the ability to isometrically hold dynamic postures, balance training on stable and unstable surfaces, coordination activities, functional mobility,² and the use of external devices and garments.

TheraTogs are one such garment reported to positively influence body awareness, posture, balance, gait, and motor performance.³ TheraTogs are comprised of a suit and strapping system intended to apply prolonged gentle force and proprioceptive input impacting muscle recruitment strategies and mimicking muscle actions to facilitate alignment and stability.³

AtaxiTogs are a form of TheraTogs designed to address deficits from cerebellar dysfunction without musculoskeletal issues.³ Although all forms of TheraTogs are widely recommended for use by clinicians, it appears that support for TheraTogs is based on subjective reports and observation of improvement³ rather than on research. Research that supports the effectiveness of TheraTogs is limited with no published research regarding the effectiveness of AtaxiTogs on balance, postural control, and ataxia in any patient population. The purpose of this case report is to describe the use of AtaxiTogs as an adjunct intervention for a patient post cerebellar injury demonstrating decreased postural control over 5 weeks.

CASE DESCRIPTION:

A 13 year-old Guatemalan female found to have multiple cerebellar AVM's. The patient underwent multiple aneurysm resections with resection of 1/3 of the right side of the cerebellum, insertion of a G-tube for feeding, and VP shunt placement secondary to development of hydrocephalus. The patient had no prior past medical or surgical history and was reported to be a healthy and active girl.

Upon examination the patient presented with the following major deficits:

- Decreased overall sitting and standing balance with slowed balance reactions
- Poor postural control with decreased trunk and upper extremity strength with poor graded and eccentric control of movement
- Poor coordination and timing of movements (Jerky, rapid bursts)
- Low tone in the trunk
- Moderate truncal ataxia and dysmetria of the limbs right > left during all functional tasks
- Decreased functional independence
 - Contact guard to perform bed mobility, minimal to moderate assistance to transition to sitting, sit to and from standing, complete transfers with and without a walker, statically stand, and ambulate less than 20 feet with a walker.

INTERVENTION:

Traditional interventions including strengthening of the trunk and proximal musculature in varied dynamic positions was performed with emphasis on isometric holding, PNF techniques including alternating isometrics and rhythmic stabilization, balance training on varied surfaces and in altered positions, adapted tricycle riding, and functional training comprised the patient's treatment plan. The patient was seen 5 days a week for an hour and a half.

As an adjunct treatment, the patient was provided with an AtaxiTogs suit. The patient's mother was instructed to don the AtaxiTogs under clothing each morning 6 days a week, and were to leave them on for at least 8 hours per day over a five-week period. Strapping was configured from shoulders down diagonally across the hips and pelvis and anchored around the mid to lower thigh in order to increase proprioceptive input via downward joint compression through the torso and hips and to increase proximal stability, balance, and decrease ataxia.

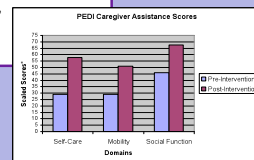
Please refer to Figures 1-3 below



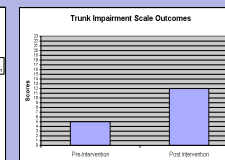
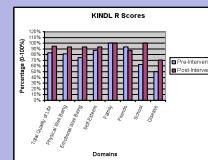
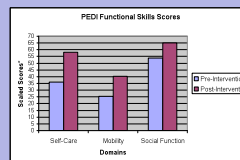
OUTCOMES:

Prior to commencing AtaxiTog intervention, objective measures including the Pediatric Evaluation of Disability (PEDI), the Trunk Impairment Scale (TIS), and the KINDL[®] Questionnaire for Measuring Health-Related Quality of Life in Children and Adolescents were administered to the patient. After 5 weeks of traditional intervention along with AtaxiTogs, substantial improvements were noted in all of the above objective measures with and without the AtaxiTogs donned, demonstrating increased functional capabilities, strength and control of movement, and increased perceptions of quality of life and confidence. Although the patient performed similarly with and without AtaxiTogs donned, it was noted that truncal ataxia appeared to have lessened with increased fluidity of and graded control of movements while wearing AtaxiTogs.

*Please refer to Charts 1-4 for pre and post intervention scores for the PEDI, KINDL[®], and TIS



*Scaled Score: Score from 0 to 100 possible points. Lower scores indicate lesser capabilities. Higher scores indicate higher capabilities



TIS Scores: A score of 23/23 indicates no trunk impairment

DISCUSSION:

The purpose of this case report was to describe the use of AtaxiTogs as an adjunct intervention for a patient post cerebellar injury demonstrating decreased postural control over 5 weeks. The patient demonstrated characteristic deficits associated with cerebellar dysfunction¹ with main limitations in postural control, balance, coordination, ataxia and dysmetria. The patient's performance on objective tests post intervention demonstrated considerable clinical and functional improvements. It remains unclear whether traditional treatment, AtaxiTogs, or a combination of both influenced patient performance. Additionally, natural healing cannot be discounted as a contributor to overall improvements. Subjective findings of increased steadiness and decreased ataxia, as well as increased confidence when using the AtaxiTogs demonstrated the positive influence of AtaxiTogs on the overall quality of and perception of patient movements.

In conclusion, this case supports the use of the AtaxiTogs system as an adjunct to traditional treatments for postural control in a patient with cerebellar dysfunction. Further research consisting of randomized controlled trials regarding the effectiveness of the AtaxiTogs system on balance, postural control, and ataxia on a large variety of patients is needed.

REFERENCES:

- O'Sullivan SB, Schmitz TJ. *Physical Rehabilitation Assessment and Treatment*. 4th ed. Philadelphia: F.A. Davis Co; 2001: 363-410,519-543,182-189.
- Campbell SK, Vander Linden DW, Palisano RJ. *Physical Therapy for Children*. 2nd ed. Philadelphia, WB Saunders, 2000.
- TheraTogs, therapy you wear. TheraTogs Inc. product page. 2007-2008. Available at: www.theratogs.com. Accessed March 24, 2008.

ACKNOWLEDGEMENTS:

A special thanks is extended to my patient who continually surprised me with her constant motivation, determination, hard work, and unwavering sense of humor, her ever present and caring family and friends, to my colleagues at New York University Langone Medical Center for their assistance and suggestions, and lastly, to Dr. Edmund Koshmahl at the University of Scranton for his direction and guidance.