

Abstract #31421

Advanced Recovery from Acute Inflammatory Demyelinating Polyneuropathy Utilizing an Anti-Gravity Treadmill

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Abstract Text:

Background and Purpose:

A 32-year-old male marathon runner with a history of Chronic Granulomatous Disease who had undergone a bone marrow transplant then partial recovery from a severe case (3 weeks in “locked-in syndrome,” 2 months ventilator, 7 months acute care/inpatient rehab, 1 year in wheelchair/outpatient rehab) of Acute Inflammatory Demyelinating Polyneuropathy (AIDP) or Guillain–Barré Syndrome presented with functional deficits in single-tip cane gait, endurance, balance, and fatigue that interfered with his daily activities of living, ability to play with his children, and goals as an athlete to return to running. The purpose of this case report is to determine the effectiveness of anti-gravity treadmill (AlterG) aerobic training on the physiological indicators, limits of stability, fatigue, and functional gait of a recreational runner recovering from AIDP.

Case Description:

Baseline measures included the Modified Fatigue Impact Scale (MFIS), Functional Gait Assessment (FGA), Berg Balance Scale, 6-Minute Walk Test (6 MWT), Balance Error Scoring System (BESS), and Biodex Biosway balance platform data. Intervention consisted of eight weeks of training two times a week for a total of 16 sessions with outcomes retested at week four and the end of training. An agreed goal range regarding time (from 10 to 30 minutes) and body weight support (from 65 to 10%) changed every two weeks to increase intensity of training. Heart rate (HR), oxygen saturation (SaO₂), and rate of perceived exertion (RPE) were recorded every two minutes, and the participant increased his speed during each session if his RPE and vitals were not contra-indicative. Distance and speed were recorded at the end of each training session.

Outcomes:

A two-band standard deviation analysis determined statistically significant changes for distance on the 6MWT and limits of stability on the Biosway. Minimal clinically important difference (MCID) was used with scores on the FGA, Berg, and the MFIS. The BESS was analyzed by comparing change in total time (in seconds) of each standing position before the first error occurred. MCID was demonstrated on the Berg with improvements from 53 to 56, and the FGA progressing without an assistive device from 18 to 26. The research participant showed a significant change on the 6 MWT distance (from 1210 to 1514 feet), however not on the MFIS. The forward left quadrants (73 to 87%) and backward right quadrants (52 to 89%) Biosway balance results were also significant. Lastly, an improvement of +11.74 seconds was noted on the BESS while the patient was on a firm surface in the tandem stance but other stances showed no clinical improvements.

Discussion:

The findings suggest that training on the AlterG anti-gravity treadmill is a safe and practical method of exercise for individuals recovering from AIDP that can be successfully used to increase gait endurance, distance, limits of stability, and functional balance. Further research is needed to generalize our findings and explore the long-term impact AlterG training has on the AIDP recovering body.

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References:

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Speaker Bio: Jacob F. Brewer, Ph.D., DPT, PT (Board Certified Clinical Specialist in Neurologic Physical Therapy) is Program Director and Professor at Hardin-Simmons University (HSU) with primary teaching responsibilities in neuroscience, neuroanatomy, clinical neurological physical therapy, and pediatrics with secondary teaching responsibilities in gross anatomy and healthcare management as well as serving on the core faculty of the HSU Doctor of Leadership (Ed.D.) program. Prior to academia Brewer served as Administrative Director of Rehabilitation Services at Hillcrest Health Systems (now Baylor Scott & White). He has also served as program and curriculum consultant for the University of Texas at El Paso, the University of Texas at San Antonio, Touro University Nevada, and Rocky Mountain University. Dr. Brewer is an American Physical Therapy Association (APTA) McMillan Scholar and has state and national research presentations in both neuroscience and leadership, and has published and presented courses in diverse areas such cardiopulmonary and ergonomics. He completed a Leadership Internship at the APTA headquarters and has presented an evidence-based, holistic approach to leadership at various health care systems, APTA and Texas Physical Therapy Association conferences, the Texas Physical Therapy Faculty Summit, and as a faculty member of the APTA Health Policy and Administration section's Institute for Leadership in Physical Therapy: Leadership, Administration, Management and Professionalism or L.A.M.P.

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