CHILD WITH TRAUMATIC BRAIN INJURY IMPROVED GAIT ABILITIES FOLLOWING INTERVENTION WITH PEDIATRIC MOTOR-ASSISTED ELLIPTICAL TRAINING: A CASE REPORT

Guilherme M. Cesar, PhD, PT; Sonya L. Irons, PT, DPT, CCS; Alexander J. Garbin, DPT; Erin Eckels, BS; Thad W. Buster, MS; Judith M. Burnfield, PhD, PT

Movement and Neurosciences Center, Institute for Rehabilitation Science & Engineering, Madonna Rehabilitation Hospitals, Lincoln, NE, USA

Contents of this research were developed, in part, under a grant (H133G070209) from the Department of Education, National Institute on Disability and Rehabilitation Research. However, contents do not necessarily represent the policy of the Department of Education, and endorsement by the federal government should not be assumed. Support also provided by funding from The Donald and Pearl Winkler Institute Endowment. Three patents have been issued to J.M. Burnfield and T.W. Buster for the ICARE technology. Patented technology has been licensed to SportsArt for commercial distribution and any sales could lead to a royalty distribution.

Introduction

Children with physical disabilities, including traumatic brain injury (TBI), sometimes have difficulty walking and engaging in physical/ play activities. A motor-assisted elliptical (ICARE) is used in rehabilitation, medical fitness, and home settings to address walking and fitness in adults.[1,2,3] Recent pediatric modifications (Pedi-ICARE) listed below enabled mass repetition of the gait-like activity[5] in children[6].

Objective

Evaluate impact of 24-session intervention with Pedi-ICARE on walking and fitness of child with TBI.

Methods

Participant: 9-year old child with TBI. Study approved by Institutional Review Board. Intervention: Motor-assisted elliptical training parameters (i.e., total exercise time, speed, motor assistance) manipulated across 24 sessions (3 days/week) to progressively challenge participants’ walking and fitness. Main Outcome Measures: Fitness level measured by changes in training capacity (exercise time, speed, time overriding motor). Walking ability measured by GAITRite (speed, cadence, functional ambulation profile, and bilateral step length).

Results

Post-intervention improvements in walking and fitness for one child with TBI are encouraging. Future clinical studies are required to elucidate impact of Pedi-ICARE training on function, fitness and community participation for children with neurologic disorders including TBI.

Conclusion

References


Acknowledgement

Contents of this research were developed, in part, under a grant (H133G070209) from the Department of Education, National Institute on Disability and Rehabilitation Research. However, contents do not necessarily represent the policy of the Department of Education, and endorsement by the federal government should not be assumed. Support also provided by funding from The Donald and Pearl Winkler Institute Endowment. Three patents have been issued to J.M. Burnfield and T.W. Buster for the ICARE technology. Patented technology has been licensed to SportsArt for commercial distribution and any sales could lead to a royalty distribution.