

Novel strategies for battling obesity and reducing cardiometabolic disease risk in those with paralysis

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The Obesity rate for individuals with SCI has been reported to be as high as 66% with a 2-3 fold increased risk of cardiometabolic diseases including heart disease, stroke and diabetes mellitus. Physical activity has been shown to be important in battling obesity and cardiometabolic disease risk, however in the SCI population, typically only the upper extremities retain voluntary muscle activity and 60-90% report shoulder pain. Thus, functional electrical stimulation lower extremities cycling (FES-LEC) has become a viable alternative for increasing physical activity levels while sparing the often over-used upper extremities. Constant cadence (FES-LEC) has been shown to provide modest improvements in increased muscle mass and decreased fat mass, especially in the lower extremities. Like-wise there is evidence of increased blood flow and enhanced arterial health in the paralyzed lower extremities. However, we have developed a resistance-guided high intensity interval FES (RG-HIIT-FES) cycling protocol that may provide equal or greater benefits with less time commitment.

Our proof-of-principle study in 3 obese persons with SCI confirmed that RG-HIIT-FES cycling 3 times per week for 8 weeks without dietary monitoring can increase legs lean mass (5-9%), increase cardiovascular health markers (58% on average) and decrease HbA1c blood levels (2-4%). Information will also be provided on preliminary results from a current follow-up study combining RG-HIIT-FES cycling and nutritional counseling on obese individuals with spinal cord injury.

Biography

David R Dolbow is currently an Assistant Professor in the School of Kinesiology at the University of Southern Mississippi. He received his bachelor and master degrees in human movement with specialization in kinesiotherapy/exercise science from Boston University, Boston, Massachusetts. He completed his PhD in Exercise Physiology/Exercise Science at Middle Tennessee State University, Murfreesboro, Tennessee and his doctorate in Physical Therapy at Belmont University, Nashville, Tennessee. He has over 30 years of clinical physical rehabilitation experience and has been a Physical Therapist Research Specialist for the past eight years. He has over 50 peer reviewed publications in scientific journals and has been a featured speaker at numerous national and international scientific meetings. His research interests include improving the quality of life in those with spinal cord injuries and other paralytic conditions through improving functional mobility and decreasing secondary morbidities such as obesity and cardiometabolic disease. Primary investigative modes of treatment include activities-based restorative therapies with lower extremities functional electrical stimulation cycling, arm ergometry and intermittent pneumatic compression being the primary focus currently. He is currently completing a funded study on electrically induced cycling and nutritional counseling for counteracting obesity after SCI.

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