Case Report

Health benefits of seated speed, resistance, and power training for an individual with spastic quadriplegic cerebral palsy: A case report

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Accepted 9 April 2015

Abstract. Children with moderate to severe cerebral palsy are at risk for low bone mass for chronological age, which compounds risk in adulthood for progressive deformity and chronic pain. Physical activity and exercise can be a key component to optimizing bone health. In this case report we present a young adult male with non-ambulatory, spastic quadriplegia CP whom began a seated speed, resistance, and power training exercise program at age 14.5 years. Exercise program continued into adulthood as part of an active lifestyle. The individual had a history of failure to thrive, bowel and bladder incontinence, reduced bone mineral density (BMD) for age, and spinal deformity at the time exercise was initiated. Participation in the exercise program began once a week for 1.5–2 hours/session, and progressed to 3–5 times per week after two years. This exercise program is now a component of his habitual lifestyle. Over the 6 years he was followed, lumbar spine and total hip BMD Z-scores did not worsen, which may be viewed as a positive outcome given his level of gross motor impairment. Additionally, the individual reported less back pain, improved bowel and bladder control, increased energy level, and never sustained an exercise related injury. Findings from this case report suggest a regular program of seated speed, resistance, power training may promote overall well-being, are safe, and should be considered as a mechanism for optimizing bone health.

Keywords: Cerebral palsy, quadriplegia, bone mineral density, exercise

1. Introduction

Children with moderate to severe cerebral palsy (CP) are at risk for low bone mineral density for chronological age [1], which increases risk for fractures, deformity, and chronic pain in adolescence and adulthood [2–5]. Of particular concern is the neurogenic pain experienced from progressive spinal deformity [6]. Physical activity in childhood may be a key component to optimizing skeletal health across the lifespan [7]. Exercise that produces high ground reaction forces creates increased bone mass in the hips and spine of pre-pubescent children with typical develop—