

Pediatric Spinal Cord Injury and Functional Electrical Stimulation Cycling

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Introduction

The purpose of this case report and evidence-based analysis is to present information and discuss current and future interventions that were performed with a 7-month-old baby girl, Baby A, who sustained an incomplete spinal cord injury (SCI) due to non-accidental trauma. Baby A was referred for inpatient rehabilitation at Carrie Tingley Children's Hospital and received approximately 9 weeks of rehabilitation before being discharged to a foster home where she eventually received Early Intervention services through Inspirations. Research was performed to explore possible future interventions for Baby A.

Methods

Several search engines were used including PubMed, CINAHL, PEDro and Cochrane. Keywords: Pediatric, Spinal Cord Injury, Functional Electrical Stimulation (FES), Cycling, Bike were all used in various combinations during the search for articles. Eight articles were used for final review, analysis and comparison to the PICO question.

PICO Question: In children with SCI, does the implementation of FES cycling prevent secondary complications such as muscle atrophy, weakness and contractures compared to traditional SCI therapy not utilizing electrical stimulation?

Findings

Functional electrical stimulation cycling is a good option for intervention for patients that have sustained a spinal cord injury. Functional electrical stimulation has many benefits including but not limited to producing a muscular contraction, which maintains muscle size thus addressing the issue of muscle atrophy. It also maintains and/or improves the strength of the stimulated muscle, addressing the issue of weakness. Also, increased joint mobility is observed, keeping the joint healthy and without contractures. When she is old enough incorporating the use of FES cycling into her outpatient therapy sessions is

anticipated. With continued and enhanced interventions including FES cycling in the future, the young child may not improve her functional status, but continue to maintain her status and prevent future secondary complications.

Conclusions

Spinal cord injuries frequently result in at least some incurable motor impairment even with the best possible treatment. There is also a high probability of prolonged issues including but not limited to GI, bowel/bladder, weakness, decreased range of motion, pathological fractures, skin integrity, heterotrophic ossifications, spasticity, scoliosis, etc. Continued traditional spinal cord injury therapy and eventual functional electrical stimulation cycling is anticipated for Baby A. Baby A may not improve her functional status, but continue to maintain her status and prevent future secondary complications as she learns how to live with her spinal cord injury.