Background

Spinal cord impairments, including spina bifida and spinal cord injury (SCI), have significant effects on a child’s ability to ambulate. Approximately 1,500 children each year are born with the neural tube defect, spina bifida (CDC, 2015), and 10% of traumatic SCIs occur in individuals under the age of 15 (Parent et al, 2010). The most common causes of pediatric SCI include motor vehicle accidents in children and sports injuries in adolescents. Research of interventions to improve gait in this population is limited, and most systematic reviews of gait facilitation in pediatrics have addressed other disorders (Domiano et al, 2009).

Purpose

The purpose of this study was to review the current literature and determine trends for interventions to improve gait in children with spinal cord impairments.

Methods

A scoping review was conducted to identify relevant citations from PubMed, Embase, and CINAHL.

● Inclusion criteria: English written papers only, human research, pediatric population (age ≤ 21), diagnosis of spinal cord impairment (spinal cord injury or spina bifida), intervention performed, gait as an outcome

● Exclusion criteria: systematic reviews, scoping reviews

This scoping review examined interventions for gait in individuals with pediatric spinal cord impairments, which, to our knowledge, had not been previously reported. Interventions studied included orthotic intervention, electric stimulation, soft tissue release, and treadmill training, with benefits reported on various components of gait for each intervention. The review revealed that interventions tended to target specific outcomes, highlighting the importance of identifying individual patient characteristics and goals appropriate for each intervention to help guide clinical practice. The studies included were primarily low level evidence, and only one article was a randomized controlled trial, which suggests the need for further research.

Conclusions

Determining the appropriate orthotic support for each child, as well as incorporating treadmill training and/or electrical stimulation is recommended. Infant stepping on a treadmill in the spina bifida population showed promising effects in increasing movement; however, future research to determine long term effects on gait and mobility is still needed. Individualized assessment is important in determining the optimal combination of interventions based on individual characteristics and response to intervention. All treatment decisions should consider each child’s lesion level, current and previous level of function and ambulation goals, as well as considering physical, social, and environmental factors.

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