Outcomes of spinal cord injuries in young children

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This commentary is on the original article by Schotter et al. on pages 1138–1143 of this issue.

The study by Schotter et al. provides critical information on a large population of children who sustained spinal cord injuries (SCI) at 5 years of age or younger and describes the outcomes for this unique population from the best of current standard practice. While the primary consequences of injury are similar to those in adults, in children the life-long impact is multiplied by the extended years of disability. The child’s life trajectory is dramatically changed, not only because of the initial consequences of the injury, but also because of the secondary consequences and complications associated with lack of weight bearing, compromised mobility, altered growth and development, and dysfunctional physiological systems. While this work highlights clinical directives, it is, more importantly, a critical foundation for reassessment of the standard practice of medical and rehabilitation care. It calls for focus on the immediate efforts of researching into and ultimately improving the quality of life and recovery of children injured at such a young age.

Of particular concern are the complications of SCI (e.g., scoliosis, hip dysplasia, pressure sores, autonomic dysreflexia, and the need for intermittent catheterization and bowel management strategies), which have a tremendous impact on quality of life, as well as on financial resources. How can we, the medical and rehabilitation communities, do better? The 96% occurrence of scoliosis in children with SCI (63% with curve ≥40°) is unacceptable and would be considered an epidemic in other realms of pediatric medicine. Knowledge of the time course of incidence and, thus, the rate of occurrence since injury, as well as noting clinical interventions, would better inform us of when a child’s musculoskeletal system is most susceptible across periods of growth. While bracing and seating with adaptations are the most recommended approaches for prevention of scoliosis, its persistent high incidence points to the failure of these strategies in this population resulting in frequent default to surgical intervention. The long-held assumption that passive positioning can impede the effects of gravity and leverage during skeletal growth and maintain spinal alignment must be reconsidered. We must go ‘back to the bench’ and rethink our approach for the very young. Activation of skeletal and postural muscles, whether in response to stimulation (externally-activated: functional electrical stimulation or internally-activated: locomotor training) may hold promise. As activity-based approaches to physical rehabilitation emerge, with the intent of activating muscles below the lesion, their role in children should be explored.

Of the 15% of this population that became community ambulators there is a marked decrease in skeletal complications, indicating that walking recovery even in the severely injured, may be key to decreasing the occurrence of these costly secondary musculoskeletal complications. Schotter et al. note that early promotion and achievement of wheelchair independence is likely to advance the child’s cognitive and social development. While such success is certainly indicative of the adaptability of children motivated to play and move in their environment, adaptability at the neuromuscular level needs to be explored as its potential may be most optimal in the youngest of those with SCI.

Clinical initiatives should be developed or further advanced in light of this study. As data from this study indicates a 77% occurrence of SCI in motor vehicle crashes when a car or booster seat was not in use, programs providing car seats to young children can certainly be better supported. Successful programs that effectively educate children and parents concerning autonomic dysreflexia (34% occurrence) should be determined and disseminated. The significance of the presence of spasticity is open to interpretation and its potential effects, positive and/or negative, need to be better understood.

This study of the state of outcomes for children who sustain SCI at 5 years of age or younger may best serve as a platform for launching the next critical research initiatives for pediatric medicine and rehabilitation. Each outcome from future research should be compared to this valuable, now historical, data set and benchmarks, to assess if the trajectory of the lives of the very youngest injured children can be improved by the next generation of therapies and interventions.

REFERENCES


