

Introduction to Special Issue

Neurodevelopmental Disorders

This issue of *Neurorehabilitation* focuses on various aspects of traumatic brain injury (a global perspective and functional MRI), cerebral palsy (feeding difficulties and baclofen pump complications) and pediatric stroke. As children under the age of 15 constitute 27% [2] of the worldwide population of 6.6 billion [1], emphasis on various neurological causes of morbidity and mortality is critical. While the most common worldwide cause of death and disability among children is primarily infections [3] – traumatic brain injury (TBI), stroke and cerebral palsy are a significant contributor to the worldwide impact of disease on children and society as a whole.

Hyder et al. provide a comprehensive review of “The impact of traumatic brain injuries: A global perspective.” From an epidemiological standpoint, one can consider TBI a global epidemic. Hyder points out that the diagnosis, medical treatment and costs vary significantly by region – as due the primary causes – road traffic accidents, violence, falls, unintentional injuries and war [5]. Those areas of the world with immediate access to acute care facilities fare much better than those without. Developed countries with rehabilitation offer more services to those with long term chronic needs compared to developing countries. Their efforts are focused on basic health care, immunizations, clean water and infrastructure. Prevention strategies such as seat belt use and alcohol prevention have shown success in various developed countries but may be nonexistent in developing countries [5]. Unfortunately, alcohol abuse is still involved in 39% of all motor vehicle deaths in the United States [4]. The implications of war, though only a small percentage of the global burden, appear to have been significantly increased with new military techniques. Adequately assessing the impact of TBI on children as Hyder clearly points out is confounded by poor data collection, definition, and treatment. Regardless, current data indicates the severe and growing consequences of this epidemic and will

require countries and organizations to work together to develop consistent treatment and prevention strategies of TBI [5].

Technological advances in medicine also provide for new diagnostic capabilities. In “Abnormalities in language circuitry in children with traumatic brain injury: an fMRI study”, Karunananya et al. describe changes in language task that was mirrored by brain activity during covert verb generation in a small cohort of moderate to severe traumatic brain injury [6]. The evolving future study and understanding of fMRI has the potential to help clinicians further understand, diagnose, and treat TBI in both children and adults.

Though this issue was not anticipated to be a comprehensive review of cerebral palsy, two important areas are addressed: complications of intrathecal baclofen and feeding disorders. Intrathecal baclofen has become an additional method of treatment in the developed world for the treatment of severe spasticity in children with cerebral palsy. Kolaski and Logan review a decades of outcomes including drug adverse effects, surgical complications, drug delivery system complications (DDS), ITB overdose and withdrawal. DDS is separated into catheter issues versus pump complications [7]. This review is critical to our current accepted treatment of patients with CP as it points out the reported high complication rates, though potentially decreasing with new surgical techniques, and a call for additional study and a national registry [7] – all critical to the evolving treatment, use and long term efficacy of ITB.

Those clinicians and researchers who have cared for children with cerebral palsy, will appreciate Clawson’s study “Use of behavioral interventions and parent education to address feeding difficulties in young children with spastic diplegic cerebral palsy.” As a colleague of hers at Children’s Hospital in Richmond, Virginia for four years, I was able to see first hand the promising results of the intensive day patient pediatric feeding pro-

gram the team has developed. This approach includes a pediatric gastroenterologist, pediatric nurse practitioner, behavioral psychologist, occupational therapist, speech-language pathologist, feeding technicians, registered dietician, diet technician, nurses, licensed clinical social worker and a case manager. An important finding was the improvements in weight percentile which were found to be significant and maintained [8]. These results should hopefully encourage insurance payors to support this interdisciplinary approach for treating these children.

Kirton et al. provide a comprehensive review in their article "Pediatric stroke: Rehabilitation of focal injury in the developing brain". The definitions and epidemiology, risk factors and pathophysiology, diagnosis and investigations along with outcomes, rehabilitation techniques (repetitive TMS, electrical stimulation, tone, assistive devices and impairment) are discussed. Common medical morbidities, neuropsychological impairment, and the importance of family support are also reviewed.

In conclusion, as approximately 1/3 of the world's population consists of children under the age of 15, it is critical that neurological morbidity and mortality be addressed appropriately in both the developed and developing countries. While economic disparities exist worldwide, the above articles point out the progress of advanced technology and the impact that prevention can have for the neurorehabilitation of children.

Jacob A. Neufeld

Guest Editor

Children's Hospital & Research Center Oakland

747 Fifty Second Street

Oakland, CA 94609-3655, USA

E-mail: jacobneufeld@yahoo.com

References

- [1] <http://www.census.gov/ipc/www/world.html>.
- [2] <http://www.census.gov/cgi-bin/ipc/idbagg>.
- [3] http://www.who.int/child-adolescent-health/New_Publications/Overview/CAHLeaflet.pdf.
- [4] <http://www.cdc.gov/ncipc/factsheets/drving.htm>.
- [5] A.A. Hyder, C.A. Wunderlich, P. Puvanachandra, G. Gururaj and O.C. Kobusingye, The impact of traumatic brain injuries: A global perspective, *Neurorehabilitation* **22**(5) (2007), 341–353.
- [6] P.R. Karunananya, S.K. Holland, W. Yuan, M. Altay, B.V. Jones, L.J. Michaud, N.C. Walz and S.L. Wade, Neural Substrate differences in language networks and associated language behavioral impairments in children with TBI: A Preliminary fMRI investigation, *Neurorehabilitation* **22**(5) (2007), 355–369.
- [7] K. Kolaski and L. Logan, A review of the complications of intrathecal Baclofen in patients with cerebral palsy, *Neurorehabilitation* **22**(5) (2007), 383–395.
- [8] E.P. Clawson, K.S. Kuchinski and R. Bach, Use of behavioral interventions and parent education to address feeding difficulties in young children with spastic diplegic cerebral palsy, *Neurorehabilitation* **22**(5) (2007), 397–406.