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CP Research News

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1: *Pediatr Neurol.* 2008 Jul;39(1):22-32.

Selective dorsal rhizotomy in Hong Kong: multidimensional outcome measures.

Chan SH, Yam KY, Yiu-Lau BP, Poon CY, Chan NN, Cheung HM, Wu M, Chak WK.

Child Assessment Service, Department of Health, Central Kowloon Child Assessment Centre, Kowloon, Hong Kong.

We prospectively case series study evaluated the short-term effectiveness of selective dorsal rhizotomy plus physiotherapy. Twenty children with spastic cerebral palsy, selected for selective dorsal rhizotomy (mean age, 8.57 years; range, 5.96-11.18 years), were assessed before, and 6 and 12 months after, selective dorsal rhizotomy. Main outcome measures included the Modified Ashworth Scale, passive range of joint movement, the Gross Motor Function Measure, the Pediatric Evaluation of Disability Inventory, the Canadian Occupational Performance Measure, and three-dimensional gait analysis. The results confirmed that selective dorsal rhizotomy plus physiotherapy provided a statistically significant reduction of spasticity, functional improvements in mobility and self-care performance, and increased participation in social situations in our study group (85% exhibited normal intelligence, and 90% belonged to Gross Motor Function Classification System levels I-III). The Gross Motor Function Measure proved to be sensitive in documenting motor functional changes, except for children at Gross Motor Function Classification System level I. Instrumental three-dimensional gait analysis with kinematics and kinetics data analysis confirmed gait improvements in children of higher motor function. The Canadian Occupational Performance Measure indicated improvements in social participation.

PMID: 18555169 [PubMed - in process]



Please join us in February 2009 at the 3rd International Cerebral Palsy Conference in Sydney, Australia. Hosted by the CP Institute, keynote speakers include some of the world's leading cerebral palsy researchers. Call for abstracts and more details at www.cp2009.com.au

2: Gait Posture. 2008 Jun 17. [Epub ahead of print]**The gait deviation index: A new comprehensive index of gait pathology.**

Schwartz MH, Rozumalski A.

Gillette Children's Specialty Healthcare, MN, United States; University of Minnesota, Department of Orthopaedic Surgery, MN, United States; University of Minnesota, Department of Biomedical Engineering, MN, United States.

This article describes a new multivariate measure of overall gait pathology called the Gait Deviation Index (GDI). The first step in developing the GDI was to use kinematic data from a large number of walking strides to derive a set of mutually independent joint rotation patterns that efficiently describe gait. These patterns are called gait features. Linear combinations of the first 15 gait features produced a 98% faithful reconstruction of both the data from which they were derived and 1000 validation strides not used in the derivation. The GDI was then defined as a scaled distance between the 15 gait feature scores for a subject and the average of the same 15 gait feature scores for a control group of typically developing (TD) children. Concurrent and face validity data for the GDI are presented through comparisons with the Gillette Gait Index (GGI), Gillette Functional Assessment Questionnaire Walking Scale (FAQ), and topographic classifications within the diagnosis of Cerebral Palsy (CP). The GDI and GGI are strongly correlated ($r(2)=0.56$). The GDI scales with FAQ level, distinguishes levels from one another, and is normally distributed across FAQ levels six to ten and among TD children. The GDI also scales with respect to clinical involvement based on topographic CP classification in Hemiplegia Types I-IV, Diplegia, Triplegia and Quadriplegia. The GDI offers an alternative to the GGI as a comprehensive quantitative gait pathology index, and can be readily computed using the electronic addendum provided with this article.

PMID: 18565753 [PubMed - as supplied by publisher]

3: J Paediatr Child Health. 2008 Jun 12. [Epub ahead of print]**Effect of upper limb botulinum toxin-A therapy on health-related quality of life in children with hemiplegic cerebral palsy.**

Redman TA, Finn JC, Bremner AP, Valentine J.

Telethon Institute for Child Health Research, University of Western Australia, Perth, Western Australia, Australia.

Aim: Currently, the use of upper limb botulinum toxin-A (UL BTX-A) is based on evidence of functional efficacy without supporting evidence of positive change in health-related quality of life (HRQOL). While function may improve, this cannot be directly correlated with an improvement in HRQOL. Most paediatric studies use caregiver/parent proxy reports. The inclusion of child self-reports is increasing as poor correlation with proxy reports is being demonstrated. This paper aims to study the effect of UL BTX-A therapy on HRQOL in children with hemiplegic cerebral palsy (CP). **Method:** Design: Pilot prospective randomised trial. Participants: 22 children with hemiplegic CP aged 7 years 0 month-13 years 11 months (12 treatment, 10 control). Treatment: One series BTX-A injections into UL. HRQOL assessed at baseline, and 1, 3 and 6 months post-injection by completion of Pediatric Quality of Life (PedsQL) 4.0 Generic Core Scales and PedsQL 3.0 CP Module. **Outcome:** 1. Change in PedsQL scores. 2. Concordance between child self-report and parent proxy-report scores. **Results:** No statistically significant difference between treatment and control groups was observed for any domain of HRQOL. Intraclass concordance was good for the PedsQL CP Module Daily Activities, and Speech and Communication scores ($P = 0.0005$). **Conclusion:** This pilot work adds to the emerging evidence that UL BTX-A therapy has no statistically significant effect on the HRQOL of children with hemiplegic CP. With the increasing use of this therapy in children with CP, further research across the broader CP population is needed to identify whether this therapy is indicated in other target populations. Both child and parent proxy reports should be collected when assessing HRQOL in this population.

PMID: 18557810 [PubMed - as supplied by publisher]

4: Dev Med Child Neurol. 2008 May;50(5):398.

Comment on:

Dev Med Child Neurol. 2008 Mar;50(3):237; author reply 238-9.

Pass the torch, please!

Scrutton D.

Publication Types:

* Comment

* Letter

PMID: 18416724 [PubMed - indexed for MEDLINE]

5: Transplant Proc. 2008 May;40(4):1145-7.

Subarachnoid placement of stem cells in neurological disorders.

Mehta T, Feroz A, Thakkar U, Vanikar A, Shah V, Trivedi H.

Department of Anesthesiology and Critical Care, Dr H.L. Trivedi Institute of Transplantation Sciences (ITS)-G.R. Doshi and K.M. Mehta Institute of Kidney Diseases and Research Centre (IKDRC), Civil Hospital Campus, Asarwa, Ahmedabad, Gujarat, India.

BACKGROUND: "Medically untreatable neurological disorders" is an area where stem cell (SC) therapy has generated hope in the last decade. Among various routes for SC infusion, subarachnoid placement via the lumbar route is particularly challenging because of technical difficulties in this group of patients. We carried out a prospective, single-center, clinical study to analyze the technical difficulties and short- and long-term effects of SC infusion in various neurological conditions. **PATIENTS AND METHODS:** One hundred eighty patients underwent subarachnoid placement of SCs between December 2005 and October 2007. Technical difficulties in the form of localization of subarachnoid space, number of attempts, and postprocedural complications were evaluated. Functional evaluation was done with Hauser Ambulation Index by the SC transplant team on a regular basis. The Institutional Review Board approved of informed consent forms and study protocol. **RESULTS:** Of 180 patients, we encountered technical difficulties in 52 (29%) in the form of general anesthesia supplementation and difficulty localizing the lumbar space. In 102 (56.6%) patients, side effects were observed (headache, low-grade fever, and meningism), which resolved with symptomatic treatment within 24 hours. On long-term follow-up, functional indices improved in 57 (31.67%) patients, including 54 patients with traumatic paraplegia/quadriplegia, two with cerebral palsy, and one with viral encephalitis. **CONCLUSION:** Subarachnoid placement of SCs is safe with no long term adverse effects.

PMID: 18555135 [PubMed - in process]

6: Int J Psychophysiol. 2008 Apr;68(1):1-5. Epub 2007 Nov 29.

Centrally controlled heart rate changes during mental practice in immersive virtual environment: a case study with a tetraplegic.

Pfurtscheller G, Leeb R, Friedman D, Slater M.

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A tetraplegic patient was able to induce midcentral localized beta oscillations in the electroencephalogram (EEG) after extensive mental practice of foot motor imagery. This beta oscillation was used to simulate a wheel chair movement in a virtual environment (VE). The analysis of electrocardiogram (ECG) data revealed that the induced beta oscillations were accompanied by a characteristic heart rate (HR) change in form of a preparatory HR acceleration followed by a short-lasting deceleration in the order of 10-20 bpm (beats-per-minute). This provides evidence that mental practice of motor performance is accompanied not only by activation of cortical structures but also by central commands into the cardiovascular system with its nuclei in the brain stem.

Publication Types:

- * Case Reports
- * Research Support, Non-U.S. Gov't

PMID: 18187220 [PubMed - indexed for MEDLINE]

7: J Oral Rehabil. 2008 Mar;35(3):203-8.

Accumulated oropharyngeal water increases coughing during dental treatment with intravenous sedation.

Kohjitani A, Egusa M, Shimada M, Miyawaki T.

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In dental procedures performed under intravenous sedation in patients with intellectual disabilities, procedures are sometimes interrupted by the cough reflex, which may be triggered by intraoral use of water and/or increased secretion stimulating the pharyngeal/laryngeal mucosa, or by those irritating the tracheal mucosa directly through anesthetics-induced impairment of the laryngeal closure reflex. We investigated relationships between frequency of coughing episodes and intraoral use of water, water remaining in the oropharyngeal space, and mean infusion rate of propofol during dental treatments performed under intravenous sedation with midazolam and propofol. Twenty-one intellectually disabled patients were enrolled. After induction, a 14 Fr. suction catheter was inserted nasally, which was fixed where oropharyngeal suction could be done most effectively. Patients were divided into three groups according to the amount of intraoral use of water, amount of oropharyngeal suction and mean infusion rate of propofol. The amount of oropharyngeal suction significantly correlated with intraoral use of water. Frequency of coughing episodes significantly correlated with amount of oropharyngeal suction per minute. However, coughing episodes correlated neither with intraoral use of water nor with infusion rate of propofol. These findings suggested that accumulation of water in the oropharynx increased vulnerability to the cough reflex in dental treatments performed under intravenous sedation.

Publication Types:

- * Comparative Study

PMID: 18254798 [PubMed - indexed for MEDLINE]

8: J Pediatr Orthop B. 2008 Mar;17(2):69-72.

Iliac apophyseal displacement: an alternative in pediatric pelvic osteotomies.

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The traditional surgical exposure for a Salter or Chiari pelvic osteotomy involves splitting the iliac

apophysis to facilitate subperiosteal separation of the muscles of the inner and outer table of the ilium. With healing, the iliac crest frequently becomes broad and prominent, and the iliac wing hypoplastic. We addressed this issue by separating the whole iliac apophysis laterally at the junction of cartilage and bone and displacing it medially. The ilium was then exposed by subperiosteal dissection of the inner and outer table musculature. From February 1988 to June 2000, twenty-five pelvic osteotomies were performed utilizing this approach. Satisfactory exposure was achieved in each case. All osteotomies healed without iliac growth disturbances, leaving excellent cosmetic results. Resuturing the previously elevated external oblique abdominus over the iliac apophysis further improved contour and appearance, Iliac apophyseal displacement rather than splitting provided appropriate access and consistently good function and cosmesis.

PMID: 18510161 [PubMed - indexed for MEDLINE]

9: Proteomics. 2008 Mar;8(6):1221-36.

Proteasome subunit proteins and neuropathology in tauopathies and synucleinopathies: Consequences for proteomic analyses.

Zouambia M, Fischer DF, Hobo B, De Vos RA, Hol EM, Varndell IM, Sheppard PW, Van Leeuwen FW.

Faculté des Sciences Biologiques, Université des Sciences et des Technologies Houari Boumediène, Algiers, Algeria.

Accumulation of proteins in inclusions in neurological disorders is partly due to dysfunction of the ubiquitin-proteasome system. Proteasomal dysfunction may be caused by misexpression of one or more of its subunits. A large number of antibodies reactive with proteasome subunits were screened on material from patients exhibiting tau- and synucleinopathies. Many antisera against proteasomal subunits (11S activator, 19S regulator ATPase/non-ATPase, and 20S alpha and beta) resulted in a distinct nuclear and/or cytoplasmic staining of the entorhinal-hippocampal area and the temporal cortex of Alzheimer's disease (AD) patients. In particular an antibody directed against 19S regulator ATPase subunit 6b (S6b) specifically stained the neurofibrillary tangles and dystrophic neurites in AD, Down syndrome and aged nondemented controls. In other tauopathies (Pick's disease, frontotemporal dementia, progressive supranuclear palsy and argyrophilic grain disease), neuronal and/or glial inclusions were also S6b immunoreactive. In contrast, in synucleinopathies (Lewy body disease (LBD) and multiple system atrophy) no S6b staining was seen. Real time quantitative PCR on the temporal cortex of AD patients revealed a significant increase in S6b subunit mRNA. This increase was not found in the gyrus cinguli anterior of patients with LBD. This differential expression of S6b most likely will result in different proteomic patterns. Here we present evidence to show that S6b coexists with a reporter for proteasomal dysfunction (ubiquitin(+1)), and we conclude that S6b transcript up-regulation and the dysfunction in tauopathies may be functionally related.

Publication Types:

* Research Support, Non-U.S. Gov't

PMID: 18283660 [PubMed - indexed for MEDLINE]

10: J Rehabil Res Dev. 2008;45(1):53-72.

How many people would benefit from a smart wheelchair?

Simpson RC, Lopresti EF, Cooper RA.

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Independent mobility is important, but some wheelchair users find operating existing manual or powered

wheelchairs difficult or impossible. Challenges to safe, independent wheelchair use can result from various overlapping physical, perceptual, or cognitive symptoms of diagnoses such as spinal cord injury, cerebrovascular accident, multiple sclerosis, amyotrophic lateral sclerosis, and cerebral palsy. Persons with different symptom combinations can benefit from different types of assistance from a smart wheelchair and different wheelchair form factors. The sizes of these user populations have been estimated based on published estimates of the number of individuals with each of several diseases who (1) also need a wheeled mobility device and (2) have specific symptoms that could interfere with mobility device use.

PMID: 18566926 [PubMed - in process]

11: NeuroRehabilitation. 2008;23(3):199-205.

Ultrasound-guided botulinum toxin type A injection to the iliopsoas muscle in the management of children with cerebral palsy.

Depedibi R, Unlü E, Cevikol A, Akkaya T, Cakci A, Cerekçi R, Köse G, Unlüsoy D.

Ministry of Health Diskapi Research and Education Hospital, Clinic of Physical Medicine and Rehabilitation, Ankara, Turkey.

Objective: To determine the effect of botulinum toxin type A (BTX-A) on spasticity and functional development in children with cerebral palsy (CP) in conjunction with a physiotherapy program. **Method:** In this prospective study, 18 CP patients were evaluated. Multilevel BTX-A injection was applied to children at a dose of 15 U/kg. Children were assessed before and at the 5th and 12th week post-injection using Thomas test, Duncan-Ely test, passive range of motion (pROM) measurement, Distance Between Knee (DBK), Selective Motor Control (SMC) scale, modified Ashworth Scale (MAS) and modified Physician Rating Scale (mPRS). To assess functional improvement, Gross Motor Function Measure (GMFM) and Functional Independence Measure for Children (WeeFIM) were used before and at the 12th week post-injection. **Results:** At 5th week post-injection, a statistically significant decrease was determined in spasticity ($p < 0.01$). Improvement was observed in mPRS and pROM, but not in SMC. At the 12th week post-injection, GMFM ($p < 0.001$) and WeeFIM improved significantly ($p < 0.001$). The improvement in pROM and mPRS ($p < 0.01$) lasted until the 12th week post-injection, but the improvement in MAS ($p > 0.05$) and in the Tardieu test of hip adductors ($p > 0.05$) did not last after the 5th week. **Conclusion:** BTX-A injection enhances functional and motor abilities in the development process.

PMID: 18560136 [PubMed - as supplied by publisher]



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