

Monday 20 September 2010

This free weekly bulletin lists the latest research on cerebral palsy (CP), as indexed in the NCBI, PubMed (Medline) and Entrez (GenBank) databases. These articles were identified by a search using the key term "cerebral palsy".

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## Interventions

### 1. Clin Linguist Phon. 2010 Oct;24(10):759-70.

#### Frequency of consonant articulation errors in dysarthric speech.

Kim H, Martin K, Hasegawa-Johnson M, Perlman A.

Beckman Institute, University of Illinois, Urbana-Champaign, IL, USA. [hkim17@illinois.edu](mailto:hkim17@illinois.edu)

This paper analyses consonant articulation errors in dysarthric speech produced by seven American-English native speakers with cerebral palsy. Twenty-three consonant phonemes were transcribed with diacritics as necessary in order to represent non-phoneme misarticulations. Error frequencies were examined with respect to six variables: articulatory complexity, place of articulation, and manner of articulation of the target phoneme; and change in articulatory complexity, place, and manner resulting from the misarticulation. Results showed that target phonemes with high articulatory complexity were most often misarticulated, independent of intelligibility, but low-intelligibility speakers reduced the complexity of target consonants more frequently. All speakers tended to misarticulate to the adjacent place of the target place, but this pattern was most prominent for high-intelligibility speakers. Low- and mid-intelligibility speakers produced more manner errors than high-intelligibility speakers. Based on these results, a two-part model of consonant articulation errors is proposed for CP-associated spastic dysarthria.

PMID: 20831376 [PubMed - in process]

### 2. Phys Ther. 2010 Sep 16. [Epub ahead of print]

#### Muscle Architecture Predicts Maximum Strength and Is Related to Activity Levels in Cerebral Palsy.

Moreau NG, Simpson KN, Teefey SA, Damiano DL.

Department of Health Professions, Medical University of South Carolina, 77 President St, MSC 700, Charleston, SC 29425 (USA).

Background: Muscle architecture is known to be predictive of muscle function. However, it is unknown whether this relationship is similar in children and adolescents with and without cerebral palsy (CP). Objective The objective of this study was to determine whether the architecture of the rectus femoris (RF) and vastus lateralis (VL) muscles was predictive of maximum voluntary knee extensor torque in children and adolescents with and without CP and whether these measures were related to activity and participation levels. Design: A case-control design was used. METHODS: Eighteen participants with CP (mean age=12.0 years, SD=3.2) at Gross Motor Function Classification System (GMFCS) levels I through IV and 12 age-matched peers with typical development (mean age=12.3 years, SD=3.9) were evaluated. Muscle thickness, fascicle length, and fascicle angle of the RF and VL muscles were measured with 2-dimensional, B-mode ultrasound imaging. The activity and participation measures used for participants with CP were the Pediatric. OUTCOMES: Data Collection Instrument (PODCI) and the Activities Scale

for Kids, Performance Version (ASKp). RESULTS: When age and GMFCS level were controlled for, VL muscle thickness was the best predictor of knee extensor isometric torque in the group with CP ( $R(2)=.85$ ). This prediction was similar to the prediction from VL muscle thickness and age in participants with typical development ( $R(2)=.91$ ). Rectus femoris muscle fascicle length was significantly correlated with the Sports and Physical Functioning Scale of the PODCI ( $p=.49$ ), and VL muscle fascicle angle was correlated with the Transfers and Basic Mobility Scale ( $p=.47$ ) and with ASKp Locomotion ( $r=.50$ ). Limitations A limitation of this study was the small sample size. CONCLUSIONS: Ultrasound measures of VL muscle thickness, adjusted for age and GMFCS level, were highly predictive of maximum torque and have the potential to serve as surrogate measures of voluntary strength (force-generating capacity) in children and adolescents with and without CP.

PMID: 20847035 [PubMed - as supplied by publisher]

### 3. Lang Speech Hear Serv Sch. 2010 Sep 15. [Epub ahead of print]

#### Functional Seating for School-aged Children with Cerebral Palsy: An Evidence-Based Tutorial.

Costigan FA, Light J.

The Pennsylvania State University.

PURPOSE: This tutorial will prepare speech-language pathologists in evidence-based practices to support functional seating of children with cerebral palsy in the classroom and school-based therapy sessions. Speech-language pathologists will learn to: (a) recognize the positive effects of seating intervention, (b) identify the characteristics of functional seating that may produce these positive effects, and (c) realize their role in supporting functional seating for school-aged children with cerebral palsy.

METHOD: The research reporting positive effects of seating intervention for school-aged children with cerebral palsy is discussed according to the International Classification of Functioning, Disability and Health. Recommended guidelines for functional seating for school-aged children with cerebral palsy are gleaned from the research evidence. The specific role of the speech-language pathologist is then discussed. CONCLUSIONS: Seating intervention may produce positive body structure and function, activities, and participation effects for school-aged children with cerebral palsy when appropriate equipment is provided for weight bearing, the pelvis is positioned for stability and mobility, and the body is aligned. Speech-language pathologists can support functional seating for school-aged children with cerebral palsy by communicating with professionals with seating expertise and by invoking and monitoring recommended guidelines for children with basic and complex seating needs respectively.

PMID: 20844273 [PubMed - as supplied by publisher]

### 4. J Child Neurol. 2010 Sep 14. [Epub ahead of print]

#### ASKing the Kids: How Children View Their Abilities After Perinatal Stroke.

Barkat-Masih M, Saha C, Golomb MR.

Division of Pediatric Neurology, Department of Neurology, Indiana University School of Medicine, Indianapolis, Indiana.

A total of 19 children with a history of perinatal stroke were asked how they saw their own motor abilities and disabilities using the Activities Scale for Kids (ASK) performance and capability questionnaires. The median ASK performance score was significantly lower (86.7) than the median ASK capability score (93.4;  $P = .03$ ), suggesting children felt they were not doing everything they were capable of doing. Performance and capability total scores were not associated with gender or stroke type; lower performance and capability scores were associated with cerebral palsy. Within groups, performance scores were significantly lower than capability scores in girls ( $P = .02$ ), children with presumed perinatal stroke ( $P = .02$ ), children with unilateral stroke ( $P = .02$ ), and children with large versus small branch unilateral middle cerebral artery stroke ( $P = .03$ ). Further work is needed to understand why these children's performance does not match perceived capability.

PMID: 20841467 [PubMed - as supplied by publisher]

**5. Dev Med Child Neurol. 2010 Sep;52 Suppl 5:1-99.**

**Abstracts of the American Academy for Cerebral Palsy and Developmental Medicine 64th Annual Meeting. September 22-25, 2010. Washington DC, USA.**

[No authors listed]

PMID: 20831521 [PubMed - in process]

**6. Spec Care Dentist. 2010 Sep;30(5):206-10. doi: 10.1111/j.1754-4505.2010.00151.x. Epub 2010 Aug 17.**

**Caries prevalence in patients with cerebral palsy and the burden of caring for them.**

Santos MT, Biancardi M, Guare RO, Jardim JR.

Discipline of Dentistry, Persons with Disabilities Division, Cruzeiro do Sul University, São Paulo, Brazil Associate Professor of Respiratory Diseases, Federal University of São Paulo, São Paulo, Brazil.

The aim of this study was to investigate the correlation between caries prevalence in individuals with cerebral palsy (CPG) and the burden on their caregivers (CGCP) compared to nondisabled individuals (CG) and their caregivers (CGCG). In a cross-sectional assessment, 65 subjects with cerebral palsy were evaluated for their caries prevalence. The CGCP answered the Caregiver Burden Scale (CBS) questionnaire. Using the same methodology, 58 CG were evaluated and CGCG replied to the questionnaire. The CGCP had statistically significant higher scores on general strain, isolation, disappointment, environment, and total scores using the CBS questionnaire. The CPG had significantly higher values using the Decayed, Missed and Filled (DMF) index than the CG. Values for the CBS domains in general strain and disappointment and DMF index were found to have a statistically significant correlation. Taking care of an individual with CP is a potential source of continual burden for caregivers, and there is a positive correlation between caries prevalence in individuals with CP and the burden on their caregivers.

PMID: 20831739 [PubMed - in process]

**7. Hastings Cent Rep. 2010 Jul-Aug;40(4):14-5.**

**Case study. Conflicting beliefs. Commentary.**

Gupta VB.

Comment on:

Hastings Cent Rep. 2010 Jul-Aug;40(4):14.

PMID: 20672460 [PubMed - indexed for MEDLINE]

**8. Hastings Cent Rep. 2010 Jul-Aug;40(4):14.**

**Case study. Conflicting beliefs.**

[No authors listed]

Comment in:

Hastings Cent Rep. 2010 Jul-Aug;40(4):15.

Hastings Cent Rep. 2010 Jul-Aug;40(4):14-5.

PMID: 20669776 [PubMed - indexed for MEDLINE]

**9. J Clin Pediatr Dent. 2010 Summer;34(4):355-60.****Relation of salivary risk factors to dental caries in children with cerebral palsy.**

Subramaniam P, Babu KL, Rodriguez A.

Department of Pedodontics and Preventive Dentistry, The Oxford Dental College, Hospital and Research Centre, Bommanahalli, Hosur Road, Bangalore-560068, Karnataka, India. drpriyapedo@yahoo.com

One of the primary handicapping conditions of childhood is cerebral palsy (CP). Controversy exists about the incidence of dental caries and its associated salivary risk factors in cerebral palsied children. Thus the present study evaluated the correlation between dental caries and certain salivary risk factors in these children. One hundred non-institutionalized children in the age group of 5-12 years having cerebral palsy were selected. The W.H.O. criteria was used for diagnosis and recording of dental caries. Determination of the unstimulated salivary pH, buffering capacity and flow rate of stimulated saliva was carried out. The mean deft and DMFT values were 2.51 and 0.73, respectively. Salivary pH was 6.83, buffering capacity 10.84 and salivary flow rate 1.08ml/per min. A significant correlation was observed only between salivary pH and dental caries in the primary dentition of CP children.

PMID: 20831141 [PubMed - in process]

**10. Acta Ortop Mex. 2010 Mar-Apr;24(2):70-5.****Spastic hip surgery in children [Article in Spanish]**

Zamudio Carrera JE, Legorreta Cuevas G.

Hospital Shriners para Niños, México, D.F. drzamudio@hotmail.com

**BACKGROUND:** Spasticity in patients with infantile cerebral palsy may lead to progressive subluxation and/or hip dislocation. **MATERIAL AND METHODS:** Retrospective, cross-sectional trial of a cohort of patients with infantile cerebral palsy who underwent subtrochanteric osteotomy of the hip at the Shriners' Hospital for children in Mexico City, with a 5-year follow-up. X-ray evaluation was conducted pre- and postoperatively and at the 5-year follow-up using the Settecerri classification. **RESULTS:** Twenty cases were analyzed; mean age was 8.8 years. They included spastic quadriplegia, spastic diplegia, spastic paraplegia. Good results accounted for 50%, fair 30% and poor 20%. Good results in patients with quadriplegia represented 50%, with diplegia 25%, and with paraplegia 75%. Among patients undergoing single osteotomy, good results were 28%, fair 57%, and poor 14%; among those undergoing osteotomy plus cotyloplasty, good results were 63%, fair 9%, and poor 27%. Results with osteotomy plus soft tissues were good and fair in 50% of patients. **DISCUSSION:** Spasticity and its effects are always present, regardless of surgery, treatment or no treatment; this is the reason for the recurrence of deformities or articular problems of the hip. The benefit of treatment cannot be denied despite spasticity. **CONCLUSIONS:** The best results were seen among the youngest patients with spastic diplegia and spastic paraplegia. Osteotomy as a single procedure is insufficient and therefore cotyloplasty is recommended.

PMID: 20831013 [PubMed - in process]

**11. J Indian Med Assoc. 2010 Feb;108(2):114-5.****Lissencephaly--not an uncommon cause of intractable seizure in children: report of 3 cases.**

Ghosh T, Barik K, Nayek K, Ghosh M, Datta AK, Mitranityogi S.

Department of Paediatrics, Burdwan Medical College, Burdwan 713101.

Lissencephaly or azyria, a rare disorder characterised by the absence of cerebral convolutions and poorly formed sylvian fissures giving the appearance of a foetal brain with smooth cerebral surface, thickened cortical mantle and microscopic appearance of incomplete neuronal migration. It is to consider lissencephaly in the diagnosis of developmental delay with seizure disorder as many patients may be diagnosed as cerebral palsy. Several lissencephaly syndromes have been described, Here three cases of lissencephaly with developmental delay and intractable sei-

zures are reported.

PMID: 20839570 [PubMed - in process]

## Epidemiology / Aetiology / Diagnosis & Early Treatment

*Please note: This is not yet a comprehensive outline of cerebral palsy prevention literature. It is expected that more research will be included when the search terms are expanded to include key terms other than "cerebral palsy". It is a work-in-progress and it will be expanded in coming months.*

**12. J Paediatr Child Health. 2010 Sep 16. doi: 10.1111/j.1440-1754.2010.01880.x. [Epub ahead of print]**

### **Therapeutic hypothermia for newborn infants with hypoxic-ischaemic encephalopathy.**

Jacobs SE, Tarnow-Mordi WO.

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Peripartum asphyxia complicated by moderate or severe hypoxic-ischaemic encephalopathy is a devastating global health issue. A therapeutic 'window of opportunity' exists after resuscitation of the asphyxiated newborn and before the delayed phase of neuronal loss. Animal studies demonstrated that neuronal injury following hypoxia-ischaemia can be prevented or reduced by a mild reduction in brain temperature. Human infant pilot studies confirmed feasibility, without major adverse effects. Randomised trials and systematic reviews comprising term infants with moderate or severe encephalopathy and peripartum asphyxia have established the neuroprotective benefit of therapeutic hypothermia. Hypothermia reduces mortality or major disability to 18 months of age, as well as cerebral palsy, and neuromotor and cognitive delay. Importantly, mortality is reduced without any increase in major neurodevelopmental disability in survivors, and with only minor adverse effects. The evidence supports therapeutic hypothermia when used within strict protocols in tertiary centres to improve the outcome for term and near-term newborns with moderate or severe hypoxic-ischaemic encephalopathy. Equally strict protocols in non-tertiary nurseries will enable earlier initiation of hypothermia under guidance of the regional neonatal intensive care unit and transport team.

PMID: 20846275 [PubMed - as supplied by publisher]

**13. Brain. 2010 Sep 13. [Epub ahead of print]**

### **Deviations of the visual upright in three dimensions in disorders of the brainstem: a clinical exploration.**

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Department of Clinical Neuroscience and Rehabilitation, Institute of Neuroscience and Physiology, The Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden.

Deviations of the subjective visual vertical in the roll or fronto-parallel plane occur commonly in disorders of the brainstem and have been extensively explored. In contrast, little is known about deviations in other directions. The present retrospective study focused on deviations in the pitch (sagittal) direction in 176 patients with a wide variety of disorders. The test task was to set a self-illuminated rod in the apparent upright position, in total darkness. Abnormal results (outside  $\pm 4^\circ$ ) were recorded in 58% of the subjects. Negative (top backward) deviations were the most common, particularly with mass lesions in the pineal region, obstructive hydrocephalus, cerebellar lesions and crowding at the craniocervical junction. Positive and negative deviations were about equally common with focal intra-axial lesions. Negative deviations appeared related to dorsal locations of lesions and vice versa. Normal pressure hydrocephalus, Parkinson's disease and progressive supranuclear palsy were associated with smaller deviations, without a clear directional preponderance, and a larger individual variability. Most subjects lacked overt clinical corollaries. The most common ocular signs were aqueduct syndromes ( $n = 17$ ) and ocular tilt reactions ( $n =$

12), which were associated with deviations in 47 and 92% of instances, respectively. Subjective corollaries of deviation were never reported, not even by those subjects who showed a dramatic improvement upon resolution of the underlying condition. Deviations were also assessed in roll in a subgroup of 40 patients with focal lesions. Thirty subjects returned abnormal results: 13% in roll, 47% in pitch and 40% in pitch and roll. The direction of roll deviation appeared primarily related to laterality, with clockwise deviations with right-sided lesions and vice versa. All subjects with ocular tilt reactions had combined pitch and roll deviations, implying a common neural substrate. Correlation analyses, geometrical modelling and experimental self-observations indicated that deviations in pitch were attributable to cyclotorsional asymmetries between the eyes. The frequent co-existence of abnormal pitch and roll results implies that the true axis of deviation in focal brainstem disorders commonly falls outside traditional reference planes. The term 'visual upright in three dimensions' is suggested to identify unrestricted measurements, preserving the established term 'visual vertical' for measurements confined to the roll plane. Assessment of the visual upright in three dimensions provides a new, quantitative angle on brainstem disorders. The test appears useful for identifying a ubiquitous yet clinically silent feature of brainstem disease and also for monitoring the evolution of underlying conditions. More detailed explorations appear well motivated.

PMID: 20837501 [PubMed - as supplied by publisher]

#### **14. Pediatrics. 2010 Sep 13. [Epub ahead of print]**

##### **Open-Label Glucocorticoids Modulate Dexamethasone Trial in Preterm Infants.**

Onland W, van Kaam AH, De Jaegere AP, Offringa M.

Department of Neonatology, Emma Children's Hospital, Academic Medical Center, Amsterdam, Netherlands; and.

Context: Open-label glucocorticoids (OLGs) were often used in trials that investigated postnatal dexamethasone treatment in ventilated preterm infants. Objective: To determine if OLG use modulates the dexamethasone treatment effect on mortality, bronchopulmonary dysplasia (BPD), and neurodevelopmental outcome. Methods: Electronic databases, s from the Pediatric Academic Societies, and results of manual reference searches were used as data sources. Fifteen randomized controlled trials comparing dexamethasone with placebo in 721 ventilated preterm infants older than 7 days were identified. The interaction between dexamethasone treatment effect and OLG use was assessed by meta-regression analysis and subgroup meta-analysis according to the percentage of OLG use in the placebo group. Trials with a moderately early (7- to 14-day) or delayed (>3-week) treatment onset were analyzed separately. Results: Moderately early, but not delayed, dexamethasone treatment significantly reduced mortality rates in trials with OLG use at <30% in the placebo arm. Meta-regression analysis revealed that this reduction was inversely related to OLG use. Increasing OLG use strengthened the positive effect of dexamethasone on BPD in the moderately early trials but attenuated the effect in the delayed-treatment trials. In trials with <30% OLG use, dexamethasone increased the risk for cerebral palsy in the delayed, but not the moderately early, treatment trials. Conclusions: When OLG use is taken into account moderately early dexamethasone treatment reduced mortality rates and the combined outcome mortality and BPD without increasing the risk of adverse neurodevelopmental outcome in ventilated preterm infants. A large randomized controlled trial is needed to confirm or refute these findings.

PMID: 20837588 [PubMed - as supplied by publisher]

#### **15. Life Sci. 2010 Sep 11. [Epub ahead of print]**

##### **Intrahippocampal injection of TsTX-I, a beta-scorpion toxin, causes alterations in electroencephalographic recording and behavior in rats.**

Teixeira VF, Conceição IM, Lebrun I, Nencioni AL, Dorce VA.

Laboratory of Pharmacology, Butantan Institute, Av. Dr. Vital Brasil, 1500, 05503-900 São Paulo, SP, Brazil; Laboratory of Pharmacology, School of Veterinary Medicine - São Paulo University, 05508-900 São Paulo, SP, Brazil.

AIMS: TsTX-I scorpion toxin, also known as  $\gamma$ -toxin, is a  $\beta$ -toxin which binds to site 4 of the sodium channel, shifting its activation potential. There are few studies about its pharmacological action in the central nervous system. The objective of this work was to determine the electroencephalographic, behavioral and histopathological effects of

intrahippocampal injection of TsTX-I. **MAIN METHODS:** Rats were anesthetized and fitted with cannulae for injection into the hippocampus and with electrodes for cerebral recording. The animals were treated with Ringer solution, some doses of TsTX-I, DMSO 0.1% or veratridine. Behavioral and electrographic recordings were observed for 4 hours after the injection. After 7 days, the rats were perfused, and their brains removed for histological analysis. **KEY FINDINGS:** Increasing doses of the toxin evoked epileptic-like discharges, wet dog shakes, and in some cases hind limb paralysis and intense respiratory difficulty followed by death. The histopathological analysis demonstrated no cell loss. Animals injected with veratridine developed epileptiform activity in the electrographic recording and neuronal loss. **SIGNIFICANCE:** The results suggest that TsTX-I toxin may be responsible, at least in part, for the epileptic and behavioral effects observed with the crude venom, and although veratridine and TsTX-I act on Na-channel, the differences between them are remarkable, demonstrating that toxins can have different functional effects depending on the site of action in the channel. Thus, animal neurotoxins are often highly selective and may be useful for the identification of the sequence of events underlying neurotransmission.

PMID: 20840850 [PubMed - as supplied by publisher]