

Monday 21 March 2011

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. Dev Med Child Neurol. 2011 Mar 17. doi: 10.1111/j.1469-8749.2011.03952.x. [Epub ahead of print]

Botulinum toxin type B for sialorrhoea in children with cerebral palsy: a randomized trial comparing three doses.

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Aim: The aim of the present study was to evaluate the efficacy and safety of three doses of botulinum toxin type B (BoNT-B) in reducing persistent sialorrhoea in children with cerebral palsy (CP). **Method:** Children with CP and refractory sialorrhoea were randomized to one of four groups: a control group and three experimental groups receiving a low (1500 mouse units [MU]), medium (3000MU), or high (5000MU) dose of BoNT-B respectively, into bilateral salivary glands. Drooling was measured using the Thomas-Stonell rating scale, and the weight and the number of bibs used per day were counted in all children at baseline, 4, and 12 weeks after BoNT-B injection. **Results:** Twenty-seven children (15 males, 12 females; mean age 7y 10mo, SD 1y 6mo; range 5-15y) were randomized into a control (seven children: four males, three females) and experimental groups receiving low (six children: four males, two females), medium (seven children: four males, three females), and high (seven children: three males, four females) doses of BoNT-B respectively. All children had mixed neurological disorders consisting of spastic paraparesis, tetraparesis, dystonic movements, and ataxia. Gross Motor Function Classification System levels ranged from III to V, and all children had moderate or severe intellectual disability. Estimated means with their standard errors (SEM) of drooling were at baseline, 4, and 12 weeks respectively, as follows: control group, 12.1 (2.1), 11.9 (2.1), 11.8 (2.2), p for trend 0.992; low dose group, 13.8 (2.3), 11.4 (2.3), 13.9 (2.3), p for trend 0.952; medium dose group, 13.9 (2.1), 6.7 (2.1), 7.1 (2.1) p for trend 0.008; and for the high dose group 14.4 (2.1), 5.0 (2.1), 5.6 (2.1), p for trend 0.002. Side effects included dense saliva, xerostomia, and difficulty in swallowing, and were more frequent in the high-dose group. **Interpretation:** A 3000MU injection of BoNT-B into the salivary glands significantly improved the frequency and severity of sialorrhoea in children with CP. The lower dose was ineffective, and the higher dose produced no greater benefit and more side effects.

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2. Dev Med Child Neurol. 2011 Mar 17. doi: 10.1111/j.1469-8749.2010.03896.x. [Epub ahead of print]

Development and evidence of validity for the Children's Hand-use Experience Questionnaire (CHEQ).

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Aim: To describe the development of the Children's Hand-use Experience Questionnaire (CHEQ), and investigate the evidence of its validity based on test content and internal structure of the three scales in it. **Method:** The selection of items and questions was based on a literature review, expert opinion, and interviews with families. Data on the final questionnaire were collected from 86 children and adolescents (42 males, 44 females) aged 6 to 18 years (mean 12y, SD 3y), with unilateral cerebral palsy, upper limb reduction deficiency, or obstetric brachial plexus palsy. **Results:** After item reduction and evaluation, CHEQ was designed to include 29 bimanual activities, each rated on three scales of perceived efficacy of the grasp, time taken to perform the activity, and degree of feeling bothered. The appropriateness of the included activities was confirmed by their reported relevance and bimanual nature. The internal structure of the scales was confirmed by Rasch analysis. **Interpretation:** CHEQ can be used to assess children and adolescents with a unilateral hand dysfunction on their experiences of using the affected hand to perform bimanual tasks. In clinical work, CHEQ has the potential to become a useful tool for treatment planning and follow-up.

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3. Dev Med Child Neurol. 2011 Apr;53(4):313-320. doi: 10.1111/j.1469-8749.2010.03859.x.

Randomized trial of constraint-induced movement therapy and bimanual training on activity outcomes for children with congenital hemiplegia.

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Aim: To determine if constraint-induced movement therapy (CIMT) is more effective than bimanual training (BIM) in improving upper limb activity outcomes for children with congenital hemiplegia in a matched-pairs randomized trial. **Method:** Sixty-three children (mean age 10.2, SD 2.7, range 5-16y; 33 males, 30 females), 16 in Manual Ability Classification System level I, 46 level II, and 1 level III and 16 in Gross Motor Function Classification level I, 47 level II) were randomly allocated to either CIMT or BIM group day camps (60 hours over 10 days). The Melbourne Assessment of Unilateral Upper Limb Function assessed unimanual capacity of the impaired limb and Assisting Hand Assessment evaluated bimanual coordination at baseline, 3 and 26 weeks, scored by blinded raters. **Results:** After concealed random allocation, there was no baseline difference between groups. CIMT had superior outcomes compared with BIM for unimanual capacity at 26 weeks (estimated mean difference [EMD] 4.4, 95% confidence interval [CI] 2.2-6.7; $p < 0.001$). There was no other significant difference between groups post-intervention. Both groups demonstrated significant improvements in bimanual performance at 3 weeks, with gains maintained by BIM at 26 weeks (EMD 2.3; 95% CI 0.6-4.0; $p = 0.008$). **Interpretation:** Overall, there were only small differences between the two training approaches. CIMT yielded greater changes in unimanual capacity of the impaired upper limb compared with BIM. Results generally reflect specificity of practice, with CIMT improving unimanual capacity and BIM improving bimanual performance. Considerable inter-individual variation in response to either intervention was evident. Future research should consider serial sequencing unimanual then BIM approaches to optimize upper limb outcomes for children with congenital hemiplegia.

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4. Dev Med Child Neurol. 2011 Apr;53(4):295-6. doi: 10.1111/j.1469-8749.2010.03882.x. Epub 2011 Jan 14.

Time demands of caring for children with cerebral palsy: what are the implications for maternal mental health?

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PMID: 21401583 [PubMed - in process]

5. Dev Med Child Neurol. 2011 Apr;53(4):293-4. doi: 10.1111/j.1469-8749.2010.03881.x. Epub 2011 Jan 14.

Bracing and splinting interventions in the upper limbs of people with cerebral palsy.

Imms C.

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PMID: 21401581 [PubMed - in process]

6. Dev Neurorehabil. 2011;14(2):87-93.

Body weight supported treadmill training improves the regularity of the stepping kinematics in children with Cerebral Palsy.

Kurz MJ, Stuberger W, Dejong SL.

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Objective: To examine if body weight supported treadmill training (BWSTT) improves the regularity of stepping kinematics in children with cerebral palsy (CP). Methods: Twelve children with CP who had Gross Motor Function Classification Scores that ranged from II-IV participated in 12 weeks of body weight supported treadmill training that was performed 2 days a week. The primary outcome measure was the regularity of the stepping kinematics, which was assessed with Fourier analysis methods. The secondary measures were the preferred walking speed, step length, lower extremity strength and section E of the GMFM. Results: BWSTT improved the rhythmical control of the stepping kinematics, preferred walking speed, step length and GMFM score. The improvements in the regularity of the stepping kinematics were strongly correlated with changes in the preferred walking speed, step length and GMFM score. Conclusion: BWSTT can improve the motor control of the walk performance of children with CP.

PMID: 21410400 [PubMed - in process]

7. Dev Neurorehabil. 2011;14(2):79-86.

Exploring the relationship of family goals and scores on standardized measures in children with cerebral palsy, using the ICF-CY.

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Aim: To explore the relationships of family selected goals and scores on standardized measures using the ICF-CY as a classification system. Methods: Goal attainment scaling (GAS)-goals (n = 110) of 22 children, 11 girls, 1-6

years, bilateral or unilateral cerebral palsy, GMFCS I-IV and MACS I-IV were linked to the ICF-CY. The children had participated in goal-directed therapy during 12 weeks. GAS-goals, baseline assessments and change scores from PEDI and GMFM-66 were used to explore the relationships. Results: All GAS-goals were classified in the Activity and Participation domain within ICF-CY. The number of GAS-goals correlated to baseline scores in PEDI and GMFM-66. The change scores in PEDI and GMFM-66 correlated to goal attainment in the Mobility and the Self-Care chapter. Conclusions: The family goals were reflected in standardized measures. The combined use of standardized and individual measures offers a possibility to explore the focus in therapy and the impact in children with cerebral palsy.

PMID: 21410399 [PubMed - in process]

8. Disabil Rehabil. 2011 Mar 14. [Epub ahead of print]

The effects of Kinesio® taping on sitting posture, functional independence and gross motor function in children with cerebral palsy.

Simşek TT, Türkücüoğlu B, Cokal N, Ustünbaş G, Simşek IE.

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Purpose: The aim of this study was to investigate the effects of Kinesio® tape (KT) application on sitting posture, gross motor function and the level of functional independence. **Method:** The study included 31 cerebral palsied children scored as level III, IV or V according to gross motor functional classification system (GMFCS). Children were randomly separated into two groups as study ($n = 15$, receiving KT and physiotherapy) and control ($n = 15$, receiving only physiotherapy). KT application was carried out for 12 weeks. Gross motor function measure (GMFM), functional independence measure for children (WeeFIM) and Sitting Assessment Scale (SAS) were used to evaluate gross motor function, independency in the activities of daily living and sitting posture, respectively. **Results:** Compared to initial assessments, both groups showed a significant difference in parameters of GMFCS sitting sub-scale, GMFCS total score and SAS scores ($p < 0.05$). At the end of 12 weeks, only SAS scores were significantly different in favour of the study group when the groups were compared ($p < 0.05$). Also, post-intervention WeeFIM scores of the study group were significantly higher compared to initial assessment ($p < 0.05$), however, no difference was detected in the control group ($p > 0.05$). **Conclusions:** No direct effects of KT were observed on gross motor function and functional independence, though sitting posture (head, neck, foot position and arm, hand function) was affected positively. These results may imply that in clinical settings KT may be a beneficial assistive treatment approach when combined with physiotherapy.

PMID: 21401336 [PubMed - as supplied by publisher]

9. Eur Spine J. 2011 Mar 15. [Epub ahead of print]

Surgical treatment of neurological scoliosis using hybrid construct (lumbar transpedicular screws plus thoracic sublaminar acrylic loops).

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In the nineties, most spinal surgeons supported the validity of segmental spine instrumentation, but this procedure has progressively been abandoned because difficult and with a high risk of neurological complications, in favor of the Cotrel-Dobousset (CD). The CD instrumentation is based on segmentation of curves, thus improving the angular correction and actuates sagittal profile. Sublaminar acrylic loops (Universal Clamp) shows the same resistance to stress as steel or titanium alloy sublaminar wires. The simple procedure and the tensioning of the strips allows re-tensioning and progressive correction. The increased contact area, improves corrective forces, thus reducing the risk of laminar fractures. The aim of this study was to verify the validity of this spinal fixation implant in the surgical treatment of a consecutive series of patients affected by neurologic scoliosis. The authors treated surgically 84 patients affected by neurologic scoliosis with an average age of 14 years (range 10-17). Universal Clamps associated

with Socore TM spinal assembly, transpedicular lumbar screws and thoracic hooks at the upper end of the curve were used. The etiology of disease was cerebral palsy in 81 cases, Friedreich ataxia in two cases and Aicardi syndrome in one case. The average preoperative angular value was $73^\circ \pm 16^\circ$. It was implanted a mean of seven Clamps for each procedure (range 5-9). The average percentage of correction was 72%. Mean operative time was 240 ± 30 min with mean blood loss of 1200 ± 400 ml. No intra-operative complications occurred. Mean follow-up was 36 months. At one-year follow-up the mean loss of correction was $7^\circ \pm 2^\circ$ with no re-intervention required. This is the first report on treatment of neurological scoliosis with this hybrid construct (lumbar screws, thoracic acrylic clamps, thoracic hooks at the upper end of the curve). In this group of patients the Universal Clamps technique appeared safe and effective and its mechanical performance is comparable to all-level screws construct. Furthermore, the kyphotic component can be better managed in case of thoracic lordosis. The most important aspect of this technique is a short operative time and low vascular and neurologic risks combined with a satisfying stability in the short-postoperative period. Nevertheless, it is important to value results on a long-term follow-up to analyze correction loss, pseudoarthrosis, and mechanical failure of the strips.

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10. Eur Spine J. 2011 Mar 15. [Epub ahead of print]

Cotrel-Dubousset instrumentation in neuromuscular scoliosis.

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The study design is retrospective. The aim is to describe our experience about the treatment of patients with neuromuscular scoliosis (NMS) using Cotrel-Dubousset instrumentation. Neuromuscular scoliosis are difficult deformities to treat. A careful assessment and an understanding of the primary disease and its prognosis are essential for planning treatment which is aimed at maximizing function. These patients may have pelvic obliquity, dislocation of the hip, limited balance or ability to sit, back pain, and, in some cases, a serious decrease in pulmonary function. Spinal deformity is difficult to control with a brace, and it may progress even after skeletal maturity has been reached. Surgery is the main stay of treatment for selected patients. The goals of surgery are to correct the deformity producing a balanced spine with a level pelvis and a solid spinal fusion to prevent or delay secondary respiratory complications. The instrumented spinal fusion (ISF) with second-generation instrumentation (e.g., Luque-Galveston and unit rod constructs), are until 1990s considered the gold standard surgical technique for neuromuscular scoliosis (NMS). Still in 2008 Tsirikos et al. said that "the Unit rod instrumentation is a common standard technique and the primary instrumentation system for the treatment of pediatric patients with cerebral palsy and neuromuscular scoliosis because it is simple to use, it is considerably less expensive than most other systems, and can achieve good deformity correction with a low loss of correction, as well as a low prevalence of associated complications and a low reoperation rate." In spite of the Cotrel-Dubousset (CD) surgical technique, used since the beginning of the mid 1980s, being already considered the highest level achieved in correction of scoliosis by a posterior approach, Teli et al., in 2006, said that reports are lacking on the results of third-generation instrumentation for the treatment of NMS. Patients with neuromuscular disease and spinal deformity treated between 1984 and 2008 consecutively by the senior author (G.D.G.) with Cotrel-Dubousset instrumentation and minimum 36 months follow-up were reviewed, evaluating correction of coronal deformity, sagittal balance and pelvic obliquity, and rate of complications. 24 patients (Friedreich's ataxia, 1; cerebral palsy, 14; muscular dystrophy, 2; polio, 2; syringomyelia, 3; spinal atrophy, 2) were included. According the evidence that the study period is too long (1984-2008) and that in more than 20 years many things changed in surgical strategy and techniques, all patients were divided in two groups: only hooks (8 patients) or hybrid construct (16 patients). Mean age was 18.1 years at surgery (range 11 years 7 months-max 31 years; in 17 cases the age at surgery time was between 10 and 20 years old; in 6 cases it was between 20 and 30 and only in 1 case was over 30 years old). Mean follow-up was 142 months (range 36-279). The most frequent patterns of scoliosis were thoracic (10 cases) and thoracolumbar (9 cases). In 8 cases we had hypokyphosis, in 6 normal kyphosis and in 9 hyperkyphosis. In 8 cases we had a normal lordosis, in 11 a hypolordosis and in 4 a hyperlordosis. In 1 case we had global T4-L4 kyphosis. In 8 cases there were also a thoracolumbar kyphosis (mean value 24° , min 20° -max 35°). The mean fusion area included 13 vertebrae (range 6-19); in 17 cases the upper end vertebra was over T4 and in 11 cases the lower end vertebra was over L4 or L5. In 7 cases the lower end vertebra was S1 to correct the pelvic obliquity. In 5 cases the severity of the deformity (mean Cobb's angle 84.2°) imposed a preoperative halo traction treatment. There were 5 anteroposterior and 19 posterior-only procedures. In 10 cases, with low bone quality, the arthrodesis was performed using iliac grafting technique while in the other (14 cases) using

autologous bone graft obtained in situ from vertebral arches and spinous processes (in all 7 cases with fusion extended until S1, it was augmented with calcium phosphate). The mean correction of coronal deformity and pelvic obliquity averaged, respectively, 57.2% (min 31.8%; max 84.8%) and 58.9% (mean value preoperative, 18.43°; mean value postoperative, 7.57°; mean value at last follow-up, 7.57°). The sagittal balance was always restored, reducing hypo or hyperkyphosis and hypo or hyperlordosis. Also in presence of a global kyphosis, we observed a very good restoration (preoperative, 65°; postoperative, 18° kyphosis and 30° lordosis, unmodified at last f.u.). The thoracolumbar kyphosis, when present (33.3% of our group) was always corrected to physiological values (mean 2°, min 0°-max 5°). The mean intraoperative blood lost were 2,100 cc (min 1,400, max 5,350). Major complications affected 8.3% of patients, and included 1 postoperative death and 1 deep infection. Minor complications affected none of patients. CD technique provides lasting correction of spinal deformity in patients with neuromuscular scoliosis, with a lower complications rate compared to reports on second-generation instrumented spinal fusion.

PMID: 21404030 [PubMed - as supplied by publisher]

11. J Pediatr Orthop. 2011 Apr-May;31(3):277-83.

Transverse-plane Pelvic Asymmetry in Patients With Cerebral Palsy and Scoliosis.

Ko PS, Jameson PG 2nd, Chang TL, Sponseller PD.

Department of Orthopaedic Surgery, The Johns Hopkins University, Baltimore, MD.

BACKGROUND: Pelvic obliquity and loss of sitting balance develop from progressive scoliosis in cerebral palsy (CP) and are indications for surgery. Our goal was to quantify pelvic asymmetry to help understand skeletal deformity in CP and its surgical correction. **METHODS:** We assessed pelvic angles and transverse plane symmetry in 27 consecutive patients with scoliosis and severe CP who had undergone computed tomography for spinal surgery (subjects). The program used allowed measurement of angles in the true transverse plane, compensating for any obliquity present. Measurements included angles of the upper and lower ilium with respect to the sacrum, acetabular anteversion, and sacroiliac joint angles. We compared subject measurements with those of 20 age-matched controls and used Student t test to determine whether subjects had greater asymmetry and if the asymmetry direction was correlated with the adducted hip and/or the scoliosis in subjects with windswept hips. **RESULTS:** Subjects had significantly more iliac angle asymmetry ($P=0.01$) and asymmetry of at least 10 degrees in these categories: upper ilium, 15 (mean difference, 18); above sciatic notch, 14 (mean difference, 17); just below sciatic notch, 15 (mean difference, 19); sacroiliac joint, 5; and acetabular anteversion, 6. No control had asymmetry greater than 10 degrees. Comparing subjects with and without windswept hips, the former had more asymmetrical upper iliac angles. In 16 subjects with windswept hips, the scoliosis curve convexity was ipsilateral to the more internally rotated ilium. In 4 of the 5 subjects with severely windswept hips, the side of the adducted hip had more inward iliac rotation than did the contralateral (abducted) hip. **CONCLUSIONS:** Transverse pelvic asymmetry, a little-recognized deformity in patients with severe CP, is most pronounced above the acetabulum and is more common in patients with windswept hips. Spine surgeons should be aware of such asymmetry because it may make iliac fixation challenging and account for some persistent postoperative deformity.

LEVEL OF EVIDENCE: Case-control study, Level III.

PMID: 21415687 [PubMed - in process]

12. No To Hattatsu. 2011 Mar;43(2):136-8.

Botulinum toxin in the treatment of cerebral palsy: case conference [Article in Japanese]

Nezu A, Takahashi Y.

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PMID: 21409836 [PubMed - in process]

13. *Pediatr Dent.* 2011 Jan-Feb;33(1):29-36.**Unmet dental needs and barriers to care for children with significant special health care needs.**

Nelson LP, Getzin A, Graham D, Zhou J, Wagle EM, McQuiston J, McLaughlin S, Govind A, Sadof M, Huntington NL.

Department of Developmental Biology, Harvard School of Dental Medicine, Boston, Mass, USA; Director of Post-doctoral Pediatric Dentistry, Department of Dentistry, Children's Hospital Boston, Boston, Mass, USA.

PURPOSE: The purpose of this study was to conduct the first known large scale survey of parents of children with special health care needs (CSHCN) to determine their child's: oral health status; access to dental care; perceived barriers (environmental/system and nonenvironmental/family); and oral health quality of life, accounting for each child's medical diagnosis and severity of diagnosis.

METHODS: A 72-item survey was sent to 3760 families of CSHCN throughout urban and rural Massachusetts. **RESULTS:** The study yielded 1,128 completed surveys. More than 90% of the children had seen a dentist within the past year; 66% saw a pediatric dentist, and 21% needed intense behavioral interventions. Although most families had high education levels, private dental insurance, and above average incomes, 20% of CSHCN had an unmet dental need. Children with craniofacial anomalies had twice as many unmet needs and children with cystic fibrosis had fewer unmet needs. Children with cerebral palsy, autism, developmental delay, and Down syndrome had more aversions to dental treatment, more treatment complications posed by their medical conditions, and more difficulty finding a dentist willing to provide care. Children with cystic fibrosis, metabolic disorders, or hemophilia encountered fewer barriers to care. **CONCLUSIONS:** The data paint a picture of high unmet dental needs with subpopulations of children with special health care needs who are more at risk for system barriers and internal family barriers to care based on their medical diagnoses.

PMID: 21406145 [PubMed - in process]

14. *J Anesth.* 2011 Mar 13. [Epub ahead of print]**Use of a laryngeal mask airway to stop a supraglottic air leak which prevented adequate ventilation via a tracheostomy in a patient with cerebral palsy and pneumonia.**

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We report an adolescent developing ventilation failure due to supraglottic air leakage with the use of an uncuffed hand-made tracheal tube fit to her tracheobronchial deformity. To eliminate the supraglottic air leakage, a size 2.5 laryngeal mask airway (LMA) was inserted into the oral pharynx. Most of air leakage arose from the LMA. Supraglottic air leakage was not detected under mandatory mechanical ventilation following sealing of the 15-mm connector of the LMA with a piece of tape, and the respiratory condition of the patient gradually improved. The combination of a hand-made Y-shaped tube and the LMA was useful in restoring adequate ventilation. In conditions where air leaks through the glottis during mechanical ventilation interfere with adequate ventilation or the maintenance of airway pressure, the use of an LMA may be adequate to stop or significantly decrease the leak.

PMID: 21400211 [PubMed - as supplied by publisher]

15. *Pediatr Neurol.* 2011 Apr;44(4):239-53.**Care for child development: basic science rationale and effects of interventions.**

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The past few years have witnessed increasing interest in devising programs to enhance early childhood development. We review current understandings of brain development, recent advances in this field, and their implications for clinical interventions. An expanding body of basic science laboratory data demonstrates that several interventions, including environmental enrichment, level of parental interaction, erythropoietin, antidepressants, transcranial magnetic stimulation, transcranial direct current stimulation, hypothermia, nutritional supplements, and stem cells, can enhance cerebral plasticity. Emerging clinical data, using functional magnetic resonance imaging and clinical evaluations, also support the hypothesis that clinical interventions can increase the developmental potential of children, rather than merely allowing the child to achieve an already predetermined potential. Such interventions include early developmental enrichment programs, which have improved cognitive function; high-energy and high-protein diets, which have increased brain growth in infants with perinatal brain damage; constraint-induced movement therapy, which has improved motor function in patients with stroke, cerebral palsy, and cerebral hemispherectomy; and transcranial magnetic stimulation, which has improved motor function in stroke patients.

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PMID: 21397164 [PubMed - in process]

16. *Acta Ortop Mex.* 2010 Nov-Dec;24(6):376-84.**Evaluation of the functional results in the treatment of pelvic limbs with multiple level surgery in spastic ICP patients [Article in Spanish]**

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The purpose of this study is to assess the effects of multiple level surgery of the pelvic limbs in patients with spastic infantile cerebral palsy seen at the National Rehabilitation Institute and show that their clinical improvement is comparable to the reports in the national and international literature. MATERIAL AND METHODS: This is a longitudinal, prospective, descriptive, self-controlled, before-and-after clinical trial that included patients with spastic infantile cerebral palsy who underwent multiple-level single-stage surgery from January 2007 to August 2008. The inclusion criteria were as follows: both genders, ages 4 to 16 years, with a complete clinical file, with preoperative and 8-12 month postoperative rehabilitation. Elimination criterion: any event not related with multiple-level surgery. Exclusion criterion: any surgeries prior to admission. A descriptive statistical analysis was used, together with the Student t-test and the chi-square test. RESULTS: 81 patients with a mean age of 7 +/- 3.2, an age range of 4-16 years; 60.5% males and 39.5% females. The subtypes of spastic infantile cerebral palsy were as follows: biparesis 64.2%, quadriparesis 22.2%, hemiparesis 8.6%, double hemiparesis 4.9%. The clinical-surgical classification (14) changed as a result of improvement and according to the number of surgical procedures: 6 patients (7.4%) had significant improvement ($p = 0.13$) with one procedure; 44 patients (54.3%) had significant improvement ($p = 0.002$) with two procedures; 28 patients (34.6%) had significant improvement ($p = 0.04$) with three procedures, and 3 patients (3.7%) had significant improvement ($p = 0.19$) with four procedures. On the other hand, when the number of surgical procedures was related with the diagnostic subtype of spastic infantile cerebral palsy, in those undergoing one procedure the clinical-surgical classification did not change in the cases of biparesis ($p = 0.26$), hemiparesis ($p = 0.18$), and double hemiparesis ($p = 0.50$). In those undergoing two surgical procedures the significant changes occurred for the cases of biparesis ($p = 0.20$), quadriparesis ($p = 0.007$), and double hemiparesis ($p = 0.16$). In those undergoing four procedures no changes occurred in the cases of biparesis ($p = 0.26$) and hemiparesis ($p = 0.50$). DISCUSSION: An improvement in the clinical-surgical classification was observed ($p = 0.0001$) based on the results of Gazi Zorer, as well as a significant improvement ($p < 0.001$) and an improvement reported by the gait analysis by the following authors: Ugur Sayli, Gouth, MA Khan.

PMID: 21400759 [PubMed - in process]

Epidemiology / Aetiology / Diagnosis & Early Treatment

17. Dev Med Child Neurol. 2011 Mar 17. doi: 10.1111/j.1469-8749.2011.03923.x. [Epub ahead of print]

Racial disparities in health-related quality of life in a cohort of very low birthweight 2- and 3-year-olds with and without cerebral palsy.

McManus BM, Robert SA, Albanese A, Sadek-Badawi M, Palta M.

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We examine racial differences in health-related quality of life (HRQoL) among 2- and 3-year-olds born very low birthweight (VLBW, <1500g). The sample included 611 children (290 males and 321 females) from the Newborn Lung Project, a cohort of VLBW infants hospitalized in Wisconsin's newborn intensive care units during 2003 to 2004. Of the 611 children, 14% (86/611) were black, non-Hispanic and 86% (525/611) were white, non-Hispanic and 4% (23/611) had cerebral palsy. HRQoL was measured using the Pediatric Quality of Life Inventory. Black children scored nearly four points lower (mean difference -3.6, 95% confidence interval [CI]: -6.9 to -0.3) on HRQoL than their white peers. Cerebral palsy is associated with lower HRQoL (mean difference -24.4, 95% CI: -29.3 to -19.5), especially among black children, but does not explain racial differences in HRQoL. Living in a neighborhood with lowest levels of female education is associated with lower HRQoL (mean difference -5.6, 95% CI: -9.2 to -2.1), but does not explain the racial difference in HRQoL.

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18. Disabil Rehabil. 2011 Mar 14. [Epub ahead of print]

Parental views from rural Cambodia on disability causation and change.

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Purpose. This study explored the beliefs of Cambodian parents of children with cerebral palsy regarding disability causation and their perceptions of the effectiveness of interventions in bringing about change in their child. **Results.** Beliefs around disability causation were mixed, with equal numbers of participants attributing their child's disability to biomedical causes as to traditional causes incorporating elements of Theravada Buddhism, animism and Brahmanism. While many participants had initially sought traditional interventions for their child, few found them to be effective and most had subsequently utilised medical and rehabilitation services. Parents whose children were moderately or severely impaired perceived both traditional interventions and rehabilitation to be less effective than parents of children with mild impairments. Participants generally judged the effectiveness of interventions based on functional changes in their child. **Conclusions.** The complexity of Khmer belief systems was reflected in the range of participants' perceptions of the cause of their child's disability, yet beliefs around disability causation did not appear to have determined their care-seeking behaviour or their perceptions of effectiveness of interventions.

PMID: 21401333 [PubMed - as supplied by publisher]

19. J Child Neurol. 2011 Mar 11. [Epub ahead of print]**Executive Functions in Youth With Spastic Cerebral Palsy.**

Pirila S, van der Meere JJ, Rantanen K, Jokiluoma M, Eriksson K.

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Dependent on criteria used, between 35% and 53% of the participants with cerebral palsy fulfilled the criteria of clinically relevant executive function problems as defined by Conners' (1994) Continuous Performance Test. Executive function problems were noticed mainly in participants with bilateral brain lesions and who had been born pre-term. Findings highlight the need to check for attention problems in children with cerebral palsy.

PMID: 21398561 [PubMed - as supplied by publisher]

20. Best Pract Res Clin Endocrinol Metab. 2011 Feb;25(1):125-30.**The shortest of the short: Pericentrin mutations and beyond.**

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Microcephalic or Majewski's osteodysplastic primordial dwarfism type II (MOPD II) represents the most common type of primordial dwarfism. Adult height is typically about one meter and short stature is becoming mildly disproportionate over time with mild skeletal anomalies. Mental development is usually borderline or within the low normal range but cerebrovascular events that are common in childhood can result in significant cognitive impairment and cerebral palsy. Despite cerebrovascular insults, cardiomyopathy and early onset type 2 diabetes contribute to early mortality and morbidity. Common minor clinical features are truncal obesity, high pitched voice, microdontia and pigmentary changes. MOPD II is caused by autosomal recessive loss of function mutations in the PCNT gene encoding for a key centrosomal protein. There is clinical overlap with the so called Seckel syndrome, a heterogeneous group of entities with at least four different gene loci known to date.

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21. J Med Chem. 2011 Mar 16. [Epub ahead of print]**Symmetric Double-Headed Aminopyridines, a Novel Strategy for Potent and Membrane-Permeable Inhibitors of Neuronal Nitric Oxide Synthase.**

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We report novel neuronal nitric oxide synthase (nNOS) inhibitors based on a symmetric double-headed aminopyridine scaffold. The inhibitors were designed from crystal structures of leads 1 and 2 (Delker, S. L.; Ji, H.; Li, H.; Jamal, J.; Fan, J.; Xue, F.; Silverman, R. B.; Poulos, T. L. Unexpected binding modes of nitric oxide synthase inhibitors effective in the prevention of cerebral palsy. *J. Am. Chem. Soc.* 2010, 132, 5437 - 5442) and synthesized using a highly efficient route. The best inhibitor, 3j, showed low nanomolar inhibitory potency and modest isoform selectivity. It also exhibited enhanced membrane permeability. Inhibitor 3j binds to both the substrate site and the pterin site in nNOS but only to the substrate site in eNOS. These compounds provide a basis for further development of novel, potent, isoform selective, and bioavailable inhibitors for nNOS.

PMID: 21410186 [PubMed - as supplied by publisher]

22. J Rehabil Med. 2011 Feb;43(3):251-6.

Tactile spatial resolution in unilateral brain lesions and its correlation with digital dexterity.

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OBJECTIVE: To test the tactile spatial resolution in chronic unilateral brain lesions. Additionally, since sensory deficits are thought to have an impact on motor deficits, this study investigated the correlation between tactile spatial resolution and finger dexterity. **DESIGN:** Descriptive cross-sectional study. **PATIENTS:** Twenty-two patients with unilateral brain lesions (12 children with congenital hemiplegia and 10 patients after stroke). **METHODS:** Tactile spatial resolution was measured with a grating orientation task, and finger dexterity with the Purdue Pegboard Test. **RESULTS:** Major tactile spatial resolution deficits were measured on the paretic hand and preserved abilities on the non-paretic hand, both in children with congenital hemiplegia and in patients after stroke. No correlation was found between the deficits of tactile spatial resolution and digital dexterity in the paretic hand ($r = 0.126$; $p = 0.572$). **CONCLUSION:** The specific location of tactile spatial resolution deficits on the hand contralateral to the lesion was surprising when one considers the left hemispheric dominance of tactile spatial resolution in healthy subjects. The absence of correlation between tactile spatial resolution and dexterity deficits suggest that these abilities are not related, suggesting that they should be considered separately and equally integrated into the rehabilitation of unilateral brain lesions.

PMID: 21305242 [PubMed - indexed for MEDLINE]

23. Rev Med Suisse. 2011 Jan 19;7(278):117-20.

[In Process Citation]. [Article in French]

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Morbidity of neonates born before 32 weeks remains significant. Cerebral palsy is found in up to 8 to 10% of survivors. Three randomized controlled trials evaluated the effectiveness of magnesium sulphate given to mothers with a risk of imminent very preterm delivery to prevent perinatal death or cerebral palsy in children. These studies suggest a reduction of the risk of cerebral palsy by magnesium sulphate from 6.5% to 4.8% (relative risk 0.71, 95% CI 0.55-0.91). These results remain controversial, but warrant information to the parents and the implementation of treatments protocols for selected cases.

PMID: 21400942 [PubMed - in process]