

Monday 1 February 2010

This free weekly bulletin lists the latest research on cerebral palsy (CP), as indexed in the NCBI, PubMed (Medline) and Entrez (GenBank) databases.

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Interventions

1. Invest Ophthalmol Vis Sci. 2010 Jan 27. [Epub ahead of print]

Profile of Refractive Errors in Cerebral Palsy (CP): impact of severity of motor impairment (GMFCS) and CP subtype on refractive outcome.

Saunders KJ, Little JA, McClelland JF, Jackson AJ.

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Purpose: To describe refractive status in children/young adults with CP and relate refractive error to standardised measures of type/severity of CP impairment and to ocular dimensions. **Methods:** A population-based sample of 118 participants aged 4-23 years with CP (mean 11.64+/-4.06) and an age appropriate control group (n=128, age 4-16 years, mean 9.33+/-3.52) were recruited. Motor impairment was described using the Gross Motor Function Classification Scale (GMFCS) and subtype allocated using the Surveillance of Cerebral Palsy in Europe (SCPE). Measures of refractive error were obtained from all participants and ocular biometry from a subgroup with CP. **Results:** (1) A significantly higher prevalence and magnitude of refractive error was found in the CP group compared to controls. (2) Axial length and spherical refractive error were strongly related. This relation did not improve with inclusion of corneal data. (3) There was no relation between the presence or magnitude of spherical refractive errors in CP and the level of motor impairment, intellectual impairment or the presence of communication difficulties. Higher spherical refractive errors were significantly associated with the non-spastic CP subtype. (4) The presence and magnitude of astigmatism was greater when intellectual impairment was more severe and astigmatic errors were explained by corneal dimensions. **Conclusions:** High refractive errors are common in CP pointing to impairment of the emmetropisation process. Biometric data support this possibility. In contrast to other functional vision measures, spherical refractive error is unrelated to CP severity but those with non-spastic CP tend to demonstrate the most extreme errors of refraction.

PMID: 20107180 [PubMed - as supplied by publisher]

2. Clin Rehabil. 2010 Jan 26. [Epub ahead of print]

Construct validity of the Capacity Profile in adolescents with cerebral palsy.

Meester-Delver A, Beelen A, Eck MV, Voorman J, Dallmeijer A, Nollet F, Becher J.

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Objective: To establish construct validity of the Capacity Profile, a method to comprehensively classify additional care needs in five domains of body functions (physical health, motor, sensory, mental, voice and speech functions), in adolescents with non-progressive, permanent conditions such as cerebral palsy. **Design:** Cross-sectional study. **Subjects:** Ninety-four adolescents with cerebral palsy: 60 boys, 34 girls, median age 14.3, range 12-16 years, unilateral (n = 37), bilateral (n = 57), spastic (n = 76), ataxic (n = 4), dyskinetic (n = 5), mixed (dyskinetic and spastic, n = 9), Gross Motor Function Classification System: level I (n = 50), level II (n = 6), level III (n = 10), level

IV (n = 8), level V (n = 20). Methods: Associations were calculated between Capacity Profile domains and Vineland Adaptive Behavior Scales (communication, daily activities, social and motor skills) and Gross Motor Function Classification System using Spearman's rho. Furthermore, we explored the independent contribution of the Capacity Profile domains to activities and participation measured with the Vineland Adaptive Behavior Scales. Results: All Capacity Profile domains were significantly associated with all domains of the Vineland Adaptive Behavior Scales and the Gross Motor Function Classification System ($P < 0.05$). Multiple regression analysis showed that the Capacity Profile contributed 87% to variance in communication (Capacity Profile-voice 78%, mental 8% and physical 1%), 85% to daily activities (Capacity Profile-mental 75%, motor 8% and voice 2%), 60% to social skills (Capacity Profile-voice 56% and mental 4%), and 91% to motor skills (Capacity Profile-motor 87%, mental 3% and sensory 1%). Conclusion: These findings support the construct validity of the Capacity Profile in adolescents with cerebral palsy. Construct validity in other medical conditions should be further investigated.

PMID: 20103569 [PubMed - as supplied by publisher]

3. Neurology. 2010 Jan 26;74(4):336-43.

Practice parameter: pharmacologic treatment of spasticity in children and adolescents with cerebral palsy (an evidence-based review): report of the Quality Standards Subcommittee of the American Academy of Neurology and the Practice Committee of the Child Neurology Society.

Delgado MR, Hirtz D, Aisen M, Ashwal S, Fehlings DL, McLaughlin J, Morrison LA, Shrader MW, Tilton A, Vargus-Adams J.

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OBJECTIVE: To evaluate published evidence of efficacy and safety of pharmacologic treatments for childhood spasticity due to cerebral palsy. **METHODS:** A multidisciplinary panel systematically reviewed relevant literature from 1966 to July 2008. **RESULTS:** For localized/segmental spasticity, botulinum toxin type A is established as an effective treatment to reduce spasticity in the upper and lower extremities. There is conflicting evidence regarding functional improvement. Botulinum toxin type A was found to be generally safe in children with cerebral palsy; however, the Food and Drug Administration is presently investigating isolated cases of generalized weakness resulting in poor outcomes. No studies that met criteria are available on the use of phenol, alcohol, or botulinum toxin type B injections. For generalized spasticity, diazepam is probably effective in reducing spasticity, but there are insufficient data on its effect on motor function and its side-effect profile. Tizanidine is possibly effective, but there are insufficient data on its effect on function and its side-effect profile. There were insufficient data on the use of dantrolene, oral baclofen, and intrathecal baclofen, and toxicity was frequently reported. **Recommendations:** For localized/segmental spasticity that warrants treatment, botulinum toxin type A should be offered as an effective and generally safe treatment (Level A). There are insufficient data to support or refute the use of phenol, alcohol, or botulinum toxin type B (Level U). For generalized spasticity that warrants treatment, diazepam should be considered for short-term treatment, with caution regarding toxicity (Level B), and tizanidine may be considered (Level C). There are insufficient data to support or refute use of dantrolene, oral baclofen, or continuous intrathecal baclofen (Level U).

PMID: 20101040 [PubMed - in process]

4. J Pediatr Orthop B. 2010 Jan 22. [Epub ahead of print]

Computerized static posturographic assessment after treatment of equinus deformity in children with cerebral palsy.

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Assessment of treatments in children with cerebral palsy has been well developed, especially in the gait laboratory. However, the prerequisite for walking is adequate postural control. We hypothesize that a treatment of an equinus deformity should improve postural control. Balance control was assessed by static posturography on the Balance

Master. Nine diplegic children, six girls and three boys, participated in the study. Assessment was conducted before and after treatment of the equinus deformity. Two static tests (Weight Bearing Squat and the modified Clinical Test for Sensory Interaction on Balance), and two dynamic balance tests (Limits of Stability and Rhythmic Weight Shift) were performed on the Balance Master. After treatment, mean weight-bearing asymmetry measured by the Weight Bearing Squat was significantly improved at 30 degrees of knee flexion. In the modified Clinical Test for Sensory Interaction on Balance, there was a significant improvement in two conditions (eyes closed on foam surface and the composite score). The Limits of Stability was very difficult to perform for almost all the children. In the Rhythmic Weight Shift, mean directional control improved significantly in three conditions (left/right weight shift at 1 s of transition, front/back weight shift at 2 s of transition and the composite score of the front/back direction). The Balance Master offers the opportunity for an objective and easy assessment of postural control in children with cerebral palsy.

PMID: 20101192 [PubMed - as supplied by publisher]

5. Gait Posture. 2010 Jan 20. [Epub ahead of print]

Mechanical work performed by the legs of children with spastic diplegic cerebral palsy.

Kurz MJ, Stuberger WA, Dejong SL.

Munroe-Meyer Institute for Genetics and Rehabilitation, Physical Therapy Department, University of Nebraska Medical Center, Omaha, Nebraska, USA.

The purpose of this investigation was to evaluate the work performed on the center of mass by the legs of children with cerebral palsy. 10 children that were diagnosed as having cerebral palsy with spastic diplegia (Age=9.1+/-2 years), and 10 healthy children with no walking disabilities participated (Age=9.4+/-2 years). We collected individual leg ground reaction forces from four force platforms, and calculated the mechanical work performed on the center of mass by the lead and trail legs. The normalized walking speeds were not significantly ($p=0.33$) different between the children with cerebral palsy (0.26 ± 0.07) and the controls (0.28 ± 0.06). The children with cerebral palsy performed significantly more negative work by the lead leg during double support ($p=0.0004$), and significantly less positive work by the trail leg ($p<0.00001$). During single support, the children with cerebral palsy performed significantly more positive work on the center of mass ($p<0.00001$). No significant differences were found for the amount of negative work performed by the leg in single support ($p=0.84$). Children with spastic diplegic cerebral palsy show a diminished ability to appropriately perform mechanical work by the legs to lift and redirect the center of mass. The altered mechanical work performed by the legs on the center of mass may play a role in the higher metabolic cost for walking noted in children with cerebral palsy. Copyright © 2010. Published by Elsevier B.V.

PMID: 20096588 [PubMed - as supplied by publisher]

6. Arch Phys Med Rehabil. 2010 Jan;91(1):143-8.

The health and quality of life outcomes among youth and young adults with cerebral palsy.

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The health and quality of life outcomes among youth and young adults with cerebral palsy. OBJECTIVES: To describe the health and quality of life (QoL) of youth and young adults who have cerebral palsy (CP), and to assess the impact of 3 key factors (severity, age, and sex) on these outcomes. DESIGN: Cross-sectional survey. SETTING: Participants were identified from 6 children's treatment centers in Ontario. PARTICIPANTS: The sample of participants (N=199) included youth (n=129; age, 13-17y) and adults (n=70; age, 23-33y) with a broad range of severity: 35% mild, 19% moderate, and 47% severe. INTERVENTION: Not applicable. MAIN OUTCOME MEASURES: Health Utilities Index (HUI(3)), Assessment of Quality of Life (AQoL), and Self-Rated Health (SRH). RESULTS: SRH was reported to be excellent or very good by 57% of youth and 46% of adults. Mean HUI(3) scores were .30 for youth and .31 for adults. Mean AQoL scores were .28 for youth and adults. Severity of CP in childhood predicted 55% of the variance in HUI(3) scores and 45% of the variance in AQoL scores. Age and sex were not

significant predictors of health or QoL. **CONCLUSIONS:** The observed health and QoL scores were much lower than those previously reported in the literature. This is likely a result of the inclusion of those with severe CP. The scores for youth were similar to those for adults and suggest that health and QoL outcomes were relatively stable across the transition to adulthood. Youth and adults with CP have limited health status and will require health care support throughout their lives to help them optimize their well being. Longitudinal follow-up studies are essential to understand better the patterns of health in this population over time. Copyright (c) 2010 American Congress of Rehabilitation Medicine. Published by Elsevier Inc. All rights reserved.

PMID: 20103409 [PubMed - in process]

7. Arch Phys Med Rehabil. 2010 Jan;91(1):1-8.e1.

In-home virtual reality videogame telerehabilitation in adolescents with hemiplegic cerebral palsy.

Golomb MR, McDonald BC, Warden SJ, Yonkman J, Saykin AJ, Shirley B, Huber M, Rabin B, Abdelbaky M, Nwosu ME, Barkat-Masih M, Burdea GC.

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In-home virtual reality videogame telerehabilitation in adolescents with hemiplegic cerebral palsy. **OBJECTIVE:** To investigate whether in-home remotely monitored virtual reality videogame-based telerehabilitation in adolescents with hemiplegic cerebral palsy can improve hand function and forearm bone health, and demonstrate alterations in motor circuitry activation. **DESIGN:** A 3-month proof-of-concept pilot study. **SETTING:** Virtual reality videogame-based rehabilitation systems were installed in the homes of 3 participants and networked via secure Internet connections to the collaborating engineering school and children's hospital. **PARTICIPANTS:** Adolescents (N=3) with severe hemiplegic cerebral palsy. **INTERVENTION:** Participants were asked to exercise the plegic hand 30 minutes a day, 5 days a week using a sensor glove fitted to the plegic hand and attached to a remotely monitored videogame console installed in their home. Games were custom developed, focused on finger movement, and included a screen avatar of the hand. **MAIN OUTCOME MEASURES:** Standardized occupational therapy assessments, remote assessment of finger range of motion (ROM) based on sensor glove readings, assessment of plegic forearm bone health with dual-energy x-ray absorptiometry (DXA) and peripheral quantitative computed tomography (pQCT), and functional magnetic resonance imaging (fMRI) of hand grip task. **RESULTS:** All 3 adolescents showed improved function of the plegic hand on occupational therapy testing, including increased ability to lift objects, and improved finger ROM based on remote measurements. The 2 adolescents who were most compliant showed improvements in radial bone mineral content and area in the plegic arm. For all 3 adolescents, fMRI during grip task contrasting the plegic and nonplegic hand showed expanded spatial extent of activation at posttreatment relative to baseline in brain motor circuitry (eg, primary motor cortex and cerebellum). **CONCLUSIONS:** Use of remotely monitored virtual reality videogame telerehabilitation appears to produce improved hand function and forearm bone health (as measured by DXA and pQCT) in adolescents with chronic disability who practice regularly. Improved hand function appears to be reflected in functional brain changes. Copyright (c) 2010 American Congress of Rehabilitation Medicine. Published by Elsevier Inc. All rights reserved.

PMID: 20103390 [PubMed - in process]

8. Disabil Rehabil. 2010;32(5):409-16.

Upper limb motor and sensory impairments in children with hemiplegic cerebral palsy. Can they be measured reliably?

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Purpose. To establish interrater and test-retest reliability of a clinical assessment of motor and sensory upper limb impairments in children with hemiplegic cerebral palsy aged 5-15 years. **Method.** The assessments included passive range of motion (PROM), Modified Ashworth Scale (MAS), manual muscle testing (MMT), grip strength, the House thumb and Zancolli classification and sensory function. Interrater reliability was investigated in 30 children, test-retest reliability in 23 children. **Results.** For PROM, interrater reliability varied from moderate to moderately high

(correlation coefficients 0.48-0.73) and test-retest reliability was very high (>0.81). For the MAS and MMT, total score and subscores for shoulder, elbow, and wrist showed a moderately high to very high interrater reliability (0.60-0.91) and coefficients of >0.78 for test-retest reliability. The reliability for the individual muscles varied from moderate to high. The Jamar dynamometer was found to be highly reliable. The House thumb classification showed a substantial reliability and the Zancolli classification an almost perfect reliability. All sensory modalities had a good agreement. Conclusions. For all motor and sensory assessments, interrater and test-retest reliability was moderate to very high. Test-retest reliability was clearly higher than interrater reliability. To improve interrater reliability, it was recommended to strictly standardize the test procedure, refine the scoring criteria and provide intensive rater trainings.

PMID: 20095955 [PubMed - in process]

9. Disabil Rehabil. 2010;32(5):402-8.

Gait characteristics of children with hemiplegic cerebral palsy before and after modified constraint-induced movement therapy.

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This investigation assessed selected gait parameters of children with hemiparesis before and after participation in a modified constraint-induced movement therapy program (mCIMT). Recent advances in the understanding of the relationship between mCIMT and cortical reorganization supports the use of upper-extremity mCIMT to treat lower extremity deficits. However, the effects of mCIMT on the gait patterns of children with hemiparesis remain unclear. Twelve preschool children participated in a mCIMT program for 5 consecutive days, 6 h each day. Pre- and post-intervention data, on the temporal-spatial aspects of gait, were collected with the GAITRite walkway. Data were analyzed using a repeated measures generalized linear model. Base of support decreased significantly ($p < 0.001$) following treatment and improvements were noted in most other gait descriptors. The results of this study suggest that mCIMT can increase stability and improve the overall gait pattern. This study provides a new dimension in the effects of pediatric mCIMT programs and could begin to shift the focus of this intervention to remediation of lower extremity deficits. Additional studies with a longitudinal follow-up focus to determine the long-term effects of mCIMT on walking balance and stability would be beneficial.

PMID: 20095954 [PubMed - in process]

10. Dent Update. 2009 Nov;36(9):585.

Aspects of human disease: 41. Cerebral palsy (CP).

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PMID: 20099613 [PubMed - in process]

11. J Pediatr Orthop. 2009 Oct-Nov;29(7):817-21.

Upper limbs function after intrathecal baclofen therapy in children with secondary dystonia.

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BACKGROUND: Different studies show the efficacy of intrathecal baclofen therapy (ITB) in patients with secondary dystonia because of cerebral palsy. These studies only report improvements related to dystonia reduction; however, none of them have assessed whether such benefit is reflected in limb function. The purpose of our study is to

determine whether the effects ITB therapy in patients with secondary dystonia to cerebral palsy, in addition to reducing dystonia, may also improve upper limb function. **METHODS:** Eleven patients with secondary dystonia, classified as levels 3 and 4 of the Gross Motor Function Classification System, were treated with ITB. The mean age at implant was 11.3 (SD+/-3.02) years. Before treatment and 12 months after implant, the patients were evaluated by the Melbourne Assessment of Unilateral Upper Limb and the Barry Albright scale to assess upper limb function and dystonia, respectively. **RESULTS:** We found a statistically significant improvement in both scales. The Melbourne scale total percentage score, for both limbs, increased in all patients ($P < 0.05$). Dystonia assessed by the Barry Albright scale scale decreased significantly by 15% from baseline to 12 months follow-up ($P < 0.05$). **CONCLUSIONS:** In patients with secondary dystonia treated with ITB, functional improvement of the upper limbs was observed in addition to dystonia reduction. In patients with secondary dystonia, ITB is a treatment that aims to achieve a general reduction of dystonia; this study want to show the influence that this reduction has to functional ability of patient. **LEVEL OF EVIDENCE:** Therapeutic study: level 4.

PMID: 20104168 [PubMed - in process]

12. J Pediatr Orthop. 2009 Oct-Nov;29(7):784-91.

Slotted acetabular augmentation, alone or as part of a combined one-stage approach for treatment of hip dysplasia in adolescents with cerebral palsy: results and complications in 19 hips.

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BACKGROUND: Surgical correction for the challenging combined deformities in hip dysplasia associated with cerebral palsy remains controversial. The purpose of this study was to assess the efficacy and determine the role of slotted acetabular augmentation (SAA) for the treatment of neuromuscular hip dysplasia in comparison with other treatment options. **METHODS:** We retrospectively analyzed 19 dysplastic hips in 19 patients with cerebral palsy who underwent SAA, alone or as part of a combined 1-stage approach, consisting of soft tissue lengthening and/or a proximal femoral osteotomy, during a 20-year period. **RESULTS:** The mean age at the time of operation was 14 years and 7 months (range: 12 to 17 years and 11 months). All had a closed triradiate cartilage. In 13 hips, preoperative radiographs showed major aspheric femoral head deformities. All had subluxation or dislocation of the hip and severe acetabular dysplasia, associated with a painful hip in 15 patients. Before operation, the mean migration index was 64+/-18%, the mean Sharp angle was 51+/-4 degrees, and the mean center-edge angle was -4+/-13 degrees. On immediate postoperative radiographs, they were 3+/-5%, 35+/-5 degrees, and 42+/-11 degrees. At final follow-up, the average migration index was 10+/-8%, the mean Sharp angle was 35+/-6 degrees, and the mean center-edge angle was 39+/-13 degrees. Eleven hips required soft tissue lengthening and 5 hips had a proximal femoral osteotomy at the time of the shelf procedure. At the latest follow-up (mean duration: 5 years and 5 months), 16 of the 19 hips remained anatomically reduced. **CONCLUSIONS:** Our results suggest that SAA is a successful procedure to treat advanced neurogenic acetabular dysplasia with or without femoral head deformities in skeletally mature patients.

PMID: 20104163 [PubMed - in process]

13. J Pediatr Orthop. 2009 Oct-Nov;29(7):779-83.

Combined femoral and pelvic osteotomies versus femoral osteotomy alone in the treatment of hip dysplasia in children with cerebral palsy.

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PURPOSE: Although evidence is increasing that the most effective treatment for the severely subluxated or dislocated hips is a one-stage comprehensive approach there are few studies that compare the results with the traditional approach (varus derotational osteotomy, VDRO). The purpose of this study is to evaluate the clinical and radiologic outcome after one-stage reconstruction versus VDRO alone. **METHODS:** We retrospectively analyzed 52

hips in 39 consecutive patients with spastic cerebral palsy treated from January 1997 to January 2007. Group A (36 hips) was treated with a VDRO and San Diego osteotomy and group B (16 hips) with VDRO alone. Mean age was 8.1+/-3.6 years. Mean follow-up was 4.4 years. Evaluation was performed according to clinical criteria (hip range of motion, pain, and sitting comfort) and radiographic parameters [center-edge angle, acetabular index, neckshaft angle, and Reimer's Index (MI)]. RESULTS: There were no delayed unions, avascular necrosis of the femoral head, or postoperative infections in either group. There was significant decrease in pain and improvement of the center-edge angle and acetabular index in the combined approach. Of the patients who had VDRO alone 25% needed revision procedures and none of the combined group needed other procedures. CONCLUSIONS: The clinical and radiologic results obtained by the one-stage procedure were far better than doing VDRO alone justifying a more extensive approach. Consideration should be given to performing the combined procedure in cerebral palsy patients with hip subluxation or dislocation.

PMID: 20104162 [PubMed - in process]

14. J Pediatr Orthop. 2009 Oct-Nov;29(7):771-8.

Outcomes of gastrocnemius-soleus complex lengthening for isolated equinus contracture in children with cerebral palsy.

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BACKGROUND: The goal of the gastrocnemius-soleus complex (GSC) lengthenings in children with cerebral palsy (CP) is to achieve a plantigrade foot and normalize kinematics during gait. The study purpose was to evaluate the results of GSC lengthening for isolated equinus contracture in individuals with CP. It was hypothesized that GSC lengthenings would normalize passive ankle range of motion, kinematic, kinetic, and temporal spatial parameters. **METHODS:** Gait data from 15 able-bodied participants from the laboratory normal database and passive range of motion, kinematic, kinetic, and temporal spatial gait parameters, and oxygen cost were collected and analyzed for 27 individuals with CP (36 limbs) with isolated equinus contracture who received GSC lengthenings. Data were compared between preoperative and postoperative assessments. **RESULTS:** Mean age at baseline was 11.4 years (+/-3.2 y). Mean time between surgery and postoperative gait analysis was 1.3 years (+/-0.3 y). Passive range of motion measurements were obtained. Kinematic and kinetic data for the hip, knee and ankle, and temporal spatial parameters were obtained from a representative gait trial preoperatively and postoperatively. Paired t tests ($P < 0.05$) determined whether preoperative data differed from postoperative data or from able-bodied data. The passive range of motion at the ankle was improved and normalized postoperatively. Ankle kinematics normalized without compensatory changes occurring at the knee or hip kinematics. Ankle moments and powers become more normal but did not completely normalize. Kinematics and kinetics of the hip and knee were not adversely affected. No changes in the temporal spatial data or oxygen cost occurred postoperatively. **CONCLUSIONS:** These data support the finding that with appropriate patient selection isolated GSC lengthening does not result in overcorrection. **LEVEL OF EVIDENCE:** Retrospective comparative study; level 3.

PMID: 20104161 [PubMed - in process]

15. J Pediatr Orthop. 2009 Oct-Nov;29(7):765-70.

Issues of concern after a single-event multilevel surgery in ambulatory children with cerebral palsy.

Park MS, Chung CY, Lee SH, Choi IH, Cho TJ, Yoo WJ, Lee KM.

Department of Orthopedic Surgery, Seoul National University Bundang Hospital, Bundang-Gu, Sungnam, Kyungki, Korea.

BACKGROUND: This study was performed to identify issues of concern to parents after single-event multilevel surgery in ambulatory patients with cerebral palsy. **METHODS:** Parents' reports of concern were obtained for 72 ambulatory patients with hemiplegic cerebral palsy (group H; mean age 8.7 y) and 170 ambulatory patients with diplegia (group D; mean age 8.9 y), who had undergone single-event multilevel surgery and were followed for more than 1

year (mean follow-up 5.5 y). Data were acquired using a postal survey. Issues of concern to parents were evaluated using a 5-point Likert scale (1 to 5) for each of 33 items, which was designed for this study. **RESULTS:** The top 3 issues of concern after surgery were unequal limb circumference, the operative scar, and recurrence in group H, and the operative scar, play activity, and recurrence in group D. Overall concerns were greater in group D ($P=0.001$) whereas group H was more concerned about appearance such as unequal leg length and circumference ($P=0.001$, <0.001). The issue of concern that showed the best correlation with parental satisfaction was the insufficient rehabilitation in group H ($r=-0.457$, $P<0.001$) and the improvement in walking ability in group D ($r=-0.552$, $P<0.001$). **CONCLUSIONS:** Even though parental concern over insufficient rehabilitation and improvement in walking ability showed the best correlation with parental satisfaction, related issues such as unequal leg circumference and surgical scar scored high, which appear irrelevant to the purpose of the surgical procedures. Parents' understanding should be established regarding surgical outcomes and limitations before single-event multilevel surgery. Clinicians need to pay more attention to potentially treatable issues that cause concern to parents, such as operative scars. **LEVEL OF EVIDENCE:** Diagnostic level 3.

PMID: 20104160 [PubMed - in process]

16. J Indian Soc Pedod Prev Dent. 2009 Jul-Sep;27(3):151-7.

Determinants for oral hygiene and periodontal status among mentally disabled children and adolescents.

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AIM: To assess the impact of socio-demographic and clinical variables on the oral hygiene and periodontal status in a sample of mentally disabled subjects. **MATERIALS AND METHODS:** Study sample comprised of 171 mentally disabled subjects attending a special school in Udaipur, India. Oral hygiene status was assessed by Simplified Oral Hygiene Index (OHI-S) and periodontal status by Community Periodontal Index. **RESULTS:** Stepwise linear regression analysis revealed that the best predictors in the descending order for oral hygiene index were disabled sibling, medical diagnosis, IQ level, education of mother and father. Having Down syndrome, less educated parents, poor economic status and a disabled sibling were the most important predictors for poor periodontal status. **CONCLUSIONS:** The present study highlighted that the oral hygiene and periodontal status of the present study population is poor and was influenced by medical diagnosis, IQ level, disabled sibling, parent's level of education and economic status.

PMID: 19841546 [PubMed - indexed for MEDLINE]

[Free article](#)

Epidemiology / Aetiology / Diagnosis & Early Treatment

17. Acta Paediatr. 2010 Jan 25. [Epub ahead of print]

Influence of clinical status on the association between plasma total and unbound bilirubin and death or adverse neurodevelopmental outcomes in extremely low birth weight infants.

Oh W, Stevenson DK, Tyson JE, Morris BH, Ahlfors CE, Bender GJ, Wong RJ, Perritt R, Vohr BR, Van Meurs KP, Vreman HJ, Das A, Phelps DL, O'Shea TM, Higgins RD; On Behalf of the NICHD Neonatal Research Network Bethesda MD.

Warren Alpert Medical School of Brown University, RI, USA.

Objectives: To assess the influence of clinical status on the association between total plasma bilirubin and unbound bilirubin on death or adverse neurodevelopmental outcomes at 18-22 months corrected age in extremely low birth weight infants. **Method:** Total plasma bilirubin and unbound bilirubin were measured in 1101 extremely low birth weight infants at 5 +/- 1 days of age. Clinical criteria were used to classify infants as clinically stable or unstable.

Survivors were examined at 18-22 months corrected age by certified examiners. Outcome variables were death or neurodevelopmental impairment, death or cerebral palsy, death or hearing loss, and death prior to follow-up. For all outcomes, the interaction between bilirubin variables and clinical status was assessed in logistic regression analyses adjusted for multiple risk factors. Results: Regardless of clinical status, an increasing level of unbound bilirubin was associated with higher rates of death or neurodevelopmental impairment, death or cerebral palsy, death or hearing loss and death before follow-up. Total plasma bilirubin values were directly associated with death or neurodevelopmental impairment, death or cerebral palsy, death or hearing loss, and death before follow-up in unstable infants, but not in stable infants. An inverse association between total plasma bilirubin and death or cerebral palsy was found in stable infants. Conclusions: In extremely low birth weight infants, clinical status at 5 days of age affects the association between total plasma bilirubin and death or adverse neurodevelopmental outcomes at 18-22 months of corrected age. An increasing level of UB is associated a higher risk of death or adverse neurodevelopmental outcomes regardless of clinical status. Increasing levels of total plasma bilirubin are directly associated with increasing risk of death or adverse neurodevelopmental outcomes in unstable, but not in stable infants.

PMID: 20105142 [PubMed - as supplied by publisher]

18. *J Neurotrauma*. 2010 Jan;27(1):151-61.

Polyethylene glycol enhances axolemmal resealing following transection in cultured cells and in ex vivo spinal cord.

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The integrity of the neuronal membrane is critical for its function as well as survival, and ineffective repair of damaged membranes may be one of the key factors underlying the neuronal degeneration and overall functional loss that occurs after spinal cord injury and traumatic brain injury. Previously, we showed that polyethylene glycol (PEG) can reseal axonal membranes following compression in isolated guinea pig spinal cord white matter. We now report that 10 mM PEG can also significantly enhance membrane resealing following transection in the clinically relevant conditions of low extracellular Ca(2+) and low temperature. Such beneficial effects were demonstrated both functionally, through membrane potential measured by double sucrose gap apparatus, and anatomically, through horseradish peroxidase and tetramethyl rhodamine dextran dye exclusion assays. We further noted that axons with small diameters preferentially benefited from PEG-mediated axolemmal resealing. Using atomic force microscopy, we further showed that PEG can effectively reduce neuronal membrane surface tension. We hypothesize that PEG may promote axolemmal resealing by increasing membrane line tension and reducing membrane tension, thus creating conditions more favorable to membrane resealing. In summary, these studies suggest that PEG is effective under the clinically relevant conditions of low Ca(2+) and temperature, and thus has the potential to be used in combination with other more established interventions in spinal cord and traumatic brain injury.

PMID: 19691421 [PubMed - in process]