

Monday 21 June 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 Anat. 2010 Jul;23(5):586-92.

#### **The knee kinematic pattern associated with disruption of the knee extensor mechanism in ambulant patients with diplegic cerebral palsy.**

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Failure of the knee extensor mechanism is a potentially disastrous complication of diplegic cerebral palsy and if left undiagnosed may lead to a cessation of independent walking. The disruption of the extensor mechanism usually occurs through or distal to the patella. The aim of this article is to describe the knee kinematic pattern associated with such knee pathology. We also present a mathematical model of knee crouch that leads to this problem. In a retrospective review of patients with radiographically proven disruption, we compared the postfailure clinical and kinematic data to premorbid data. All patients included in this study had attended our clinical Gait Analysis Laboratory on two occasions. In the patients with disruption of the extensor mechanism, the kinematic pattern changed from crouch with shock absorption to one of increased crouch and loss of shock absorption. Clinical characteristics included knee flexion contracture and increased hamstring tightness. We demonstrate how the prefailure crouch position of the knee increases the flexor moment arm about the knee. We suggest that this knee crouch position during walking is the primary cause of pathology. Failure of the knee extensor mechanism is associated with a distinctive knee kinematic pattern. Regular gait analysis can help identify this pathology and enable treatment to be planned accordingly. (c) 2010 Wiley-Liss, Inc.

PMID: 20544952 [PubMed - in process]

### 2. Phys Ther. 2010 Jun 17. [Epub ahead of print]

#### **Reference Values for Aerobic Fitness in Children, Adolescents, and Young Adults Who Have Cerebral Palsy and Are Ambulatory.**

Verschuren O, Bloemen M, Kruitwagen C, Takken T.

Center of Excellence for Rehabilitation Medicine Utrecht, Rehabilitation Center De Hoogstraat, Rembrandtkade 10, 3583 TM Utrecht, the Netherlands; Assistant Professor, Department of Rehabilitation, Rudolf Magnus Institute of Neuroscience, Nursing Science, and Sports, University Medical Center, Utrecht, the Netherlands; and Senior Researcher, Partner of Netchild, Network for Childhood Disability Research, Utrecht, the Netherlands.

Background: Very few objective data regarding aerobic performance in young people with cerebral palsy (CP) exist. The characterization of aerobic fitness could provide baseline and outcome measures for the rehabilitation of young people with CP. Objective: The objective of this study was to provide reference values for aerobic fitness in

a group of children, adolescents, and young adults who had CP and who were classified at Gross Motor Function Classification System (GMFCS) level I or II. Data were collected with 10-m shuttle run tests. Design: This investigation was a cross-sectional observational study conducted between August 2008 and June 2009. METHODS: Reference values were established using data from a total of 306 children, adolescents, and young adults who had CP, who were 6 to 20 years old, and who were recruited from 26 rehabilitation centers in the Netherlands, Switzerland, Australia, Canada, and the United States. A total of 211 participants were classified at GMFCS level I (mean age=12.2 years, SD=3.0), and 95 were classified at GMFCS level II (mean age=12.4 years, SD=3.2); 181 were male, and 125 were female. Aerobic fitness was reflected by the level achieved on the 10-m shuttle run tests. RESULTS: On the basis of a total of 306 assessments from the 10-m shuttle run tests, 4 reference curves were created. Limitations The limitation of this study is the cross-sectional nature of the design. CONCLUSIONS: This study provided height-related reference values for aerobic fitness in children, adolescents, and young adults who had CP, who were 6 to 20 years old, and who were classified at GMFCS level I or II. Generalized additive models for location, scale, and shape were used to construct centile curves. These curves are clinically relevant and provide a user-friendly method for the prediction of aerobic fitness in young people with CP.

PMID: 20558568 [PubMed - as supplied by publisher]

### **3. Clin Rehabil. 2010 Jun 16. [Epub ahead of print]**

#### **Effects of botulinum toxin A on calf muscles in children with cerebral palsy: a systematic review.**

Koog YH, Min BI.

Kyung Hee University, Department of East-West Medicine, Graduate School, Seoul, Republic of Korea.

Objective: To assess the efficacy of botulinum toxin A injection for the management of spastic calf muscles in children with cerebral palsy. Data sources: We reviewed all relevant literature indexed in MEDLINE, CINAHL, EMBASE, PEDro and the Cochrane Registered Trials, and also hand reviewed. Methods: Eligible studies were randomized controlled trials that compared botulinum toxin A injection with any type of treatment or no treatment with identical conditions. We extracted data on calf muscle tone, passive ankle range of motion, gait speed, ankle kinematics and Gross Motor Function Measure, and assessed methodological qualities. Results: Fifteen studies met our inclusion criteria. When botulinum injection was compared with a non-sham control, it was found to be effective at improving calf muscle tone (one month: -2.73 (confidence interval (CI) -3.42 to -2.04), three months: -1.72 (-2.68 to -0.76)), passive ankle range of motion (one month: 3.29 (CI 2.52 to 4.05), three months: 1.00 (CI 0.44 to 1.56)) and gait speed (one month: 0.91 (CI 0.29 to 1.53), three months: 0.61 (CI 0.01 to 1.21)) for four months, as well as Gross Motor Function Measure (2.02 (CI 1.30 to 2.75)) for two months. When compared with sham injection, botulinum injection was only effective on Gross Motor Function Measure (0.98 (CI 0.28 to 1.69)) after four months. Conclusions: Although we found evidence supporting the efficacy of botulinum toxin A in studies comparing botulinum injection with non-sham controls, we did not find clear evidence of support in studies comparing botulinum injection with sham injection.

PMID: 20554641 [PubMed - as supplied by publisher]

### **4. Gait Posture. 2010 Jun 15. [Epub ahead of print]**

#### **Temporal-spatial parameters of the upper limb during a Reach & Grasp Cycle for children.**

Butler EE, Ladd AL, Lamont LE, Rose J.

Department of Bioengineering, Stanford University, United States; Department of Orthopaedic Surgery, Stanford University School of Medicine, United States; Motion & Gait Analysis Laboratory, Lucile Packard Children's Hospital at Stanford, United States.

The objective of this study was to characterize normal temporal-spatial patterns during the Reach & Grasp Cycle and to identify upper limb motor deficits in children with cerebral palsy (CP). The Reach & Grasp Cycle encompasses six sequential tasks: reach, grasp cylinder, transport to self (T(1)), transport back to table (T(2)), release cylinder, and return to initial position. Three-dimensional motion data were recorded from 25 typically developing children (11 males, 14 females; ages 5-18 years) and 12 children with hemiplegic CP (2 males, 10 females; ages 5-

17 years). Within-day and between-day coefficients of variation for the control group ranged from 0 to 0.19, indicating good repeatability of all parameters. The mean duration of the Cycle for children with CP was nearly twice as long as controls, 9.5+/-4.3s versus 5.1+/-1.2s (U=37.0, P=.002), partly due to prolonged grasp and release durations. Peak hand velocity occurred at approximately 40% of each phase and was greater during the transport (T(1), T(2)) than non-transport phases (reach, return) in controls (P<.001). Index of curvature was lower during transport versus non-transport phases for all children. Children with CP demonstrated an increased index of curvature during reach (U=46.0, P=.0074) and an increased total number of movement units (U=16.5, P<.0001) compared to controls, indicating less efficient and less smooth movements. Total duration of the Reach & Grasp Cycle (rho=.957, P<.0001), index of curvature during reach and T(1) (rho=.873, P=.0002 and rho=.778, P=.0028), and total number of movement units (rho=.907, P<.0001) correlated strongly with MACS score. The consistent normative data and the substantial differences between children with CP and controls reflect utility of the Reach & Grasp Cycle for quantitative evaluation of upper limb motor deficits. Copyright © 2010. Published by Elsevier B.V.

PMID: 20558067 [PubMed - as supplied by publisher]

##### **5. Spine (Phila Pa 1976). 2010 Jun 15;35(14):E621; author reply E621-2.**

**Watanabe K, Lenke LG, Daubs MD, et al. Is spine deformity surgery in patients with spastic cerebral palsy truly beneficial? Spine 2009;34:2222-32. Mensch S, Penning C.**

Comment on:

Spine (Phila Pa 1976). 2009 Sep 15;34(20):2222-32.

PMID: 20551782 [PubMed - in process]

##### **6. Clin Biomech (Bristol, Avon). 2010 Jun 10. [Epub ahead of print]**

**Reproducibility of hand-held ankle dynamometry to measure altered ankle moment-angle characteristics in children with spastic cerebral palsy.**

Bénard MR, Jaspers RT, Huijing PA, Becher JG, Harlaar J.

Research Institute Move, Faculty of Human Movement Sciences, VU University, Amsterdam, The Netherlands; Department of Rehabilitation Medicine, VU University Medical Center, Research Institute Move, Amsterdam, The Netherlands.

**BACKGROUND:** In children with spastic cerebral palsy, the range of motion of the ankle joint is often limited. Measurement of range of motion may be hampered by a non-rigid foot deformity. We constructed a hand-held instrument which allows measurements of static ankle angle and moment in children with cerebral palsy while correcting for foot deformity. This study aimed to test the reproducibility of the instrument and to use it for measuring ankle moment-angle characteristics in individual children who are typically developing and children with cerebral palsy.

**METHODS:** Ankle angles and moments were measured at five standardized positions in ten children who are typically developing and ten children with cerebral palsy. The intraclass correlation coefficient was calculated for test-retest reliability. For precision, the standard error of measurement and smallest detectable difference were determined. The ankle range of motion and the slope of the moment-angle curve were determined, both towards plantar flexion and dorsiflexion. **FINDINGS:** The reproducibility study revealed a high reliability of the dynamometer at 5 repetitions (>0.97). Precision lies within 5 degrees for angle measurements and within 0.2 Nm for moment measurements. In the children with cerebral palsy, the range of motion towards dorsiflexion was 18 degrees lower and the slope of the moment-angle curve towards dorsiflexion was substantially higher. **INTERPRETATION:** We developed a hand-held dynamometer which allows reliable and precise measurements of static ankle angle and moment in children with cerebral palsy. The hand-held dynamometer allows corrections of foot deformities and is qualified to reproducibly evaluate moment-angle characteristics in a clinical context. Copyright © 2010 Elsevier Ltd. All rights reserved.

PMID: 20541856 [PubMed - as supplied by publisher]

**7. J Paediatr Child Health. 2010 Jun 10. [Epub ahead of print]****Spinal arteriovenous malformation presenting as spastic monoplegic cerebral palsy in a child.**

Flett PJ, Baulderstone D, Russo R, Davies RP.

Royal Hobart Hospital (formerly Children Youth and Women's Health Service (CYWHS), Adelaide).

A case of spinal arterio-venous malformation (AVM) initially diagnosed as unilateral cerebral palsy (CP) is reported. The presentation was of a long-standing spastic monoparesis of the left leg, with initial response to Botulinum toxin injections to the calf and tibialis posterior muscles. This was followed by progressive deterioration occurring over a 3-month period before further investigation and definitive diagnosis at 7 years. Imaging demonstrated a large extra-medullary spinal AVM compressing the mid-thoracic cord. This was successfully managed by embolisation with a non-adhesive polymer: ethylene-vinyl alcohol copolymer injected into the dominant feeding vessel. This case highlights the need to consider alternative diagnoses when a child with a diagnosis of CP presents with atypical clinical features such as monoparesis and has worsening or altered clinical signs. Moreover, a normal magnetic resonance imaging brain scan and the absence of ipsilateral upper limb neurological signs or functional impairment should raise suspicion even in the context of static lower limb signs. A literature review was performed on the management of spinal AVM in children and this will be discussed.

PMID: 20546106 [PubMed - as supplied by publisher]

**8. J Adv Nurs. 2010 Jun;66(6):1213-21.****Cerebral palsy: experiences of mothers after learning their child's diagnosis.**

Huang YP, Kellett UM, St John W.

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yup@sunrise.hk.edu.tw

**AIM:** This study is a report of a study describing mothers' experience of learning that their child has been diagnosed with cerebral palsy. **BACKGROUND:** Learning a child's diagnosis of disability is a crisis for parents. Their reactions include shock, refusal to accept the diagnosis, anger, fear, and uncertainty about the extent of disability and associated impairment. Knowledge about parental reactions is based on studies conducted in western countries, many of which do not apply to Taiwan where Confucianism strongly influences cultural perspectives of family and disability. **METHOD:** In this phenomenological study, data were collected in 2005-2006 using in-depth interviews and journaling with 15 Taiwanese mothers of children diagnosed with cerebral palsy. Hermeneutic analysis was undertaken of interview transcripts and journal notes. **FINDINGS:** Four shared meanings associated with learning of their child's diagnosis were revealed: feeling out of control and powerless, mistrusting healthcare professionals, release and confirmation, and feeling blamed for not following traditional practices. Mothers experienced a loss of their 'ideal' child when their child was diagnosed with cerebral palsy. Expectations of 'normal' motherhood and fulfilling societal anticipation of giving birth to a healthy child were lost. Maintaining their husband's family honour and prosperity, as well as saving face in their community were threatened. Mixed feelings of disbelief, rejection, self-blame and sadness were compounded by uncertainty about their child's future. **CONCLUSION:** To promote better understanding of the child's condition, emotional support and information should be provided to the mother and family, both when informing them of the diagnosis and in the period after diagnosis.

PMID: 20546355 [PubMed - in process]

## 9. J Rehabil Med. 2010 Jun;42(6):528-35.

### Participation and health-related quality of life in adults with spastic bilateral cerebral palsy and the role of self-efficacy.

van der Slot WM, Nieuwenhuijsen C, van den Berg-Emons RJ, Wensink-Boonstra AE, Stam HJ, Roebroek ME; Transition Research Group South West Netherlands.

Collaborators (10) Janssen WG, Bergen MP, Pangalila RF, Nieuwstraten W, Terburg M, v d Heijden-Maessen H, Arendzen JH, Buijs HJ, Ras B, Voogt T.

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**OBJECTIVE:** To assess participation and health-related quality of life in adults with bilateral spastic cerebral palsy, and explore associations with self-efficacy. **DESIGN:** Cross-sectional study. **SUBJECTS:** A sample of 56 adults with bilateral spastic cerebral palsy (mean age 36.4 (standard deviation 5.8) years; 62% male). **METHODS:** Daily activities and social participation (Life Habits 3.0), health-related quality of life (SF-36 Health Survey), demographic and clinical characteristics, and self-efficacy (General Self-Efficacy Scale (GSES-12)) were assessed. Associations were studied using multivariate logistic regression analyses. **RESULTS:** At least 60% of the sample had difficulties with mobility, recreation and housing, and 44% had difficulty with personal care and employment. They perceived low health-related quality of life for physical functions, but not for mental functions. Corrected for demographic and clinical characteristics, general self-efficacy explained 49% of the variance in outcome on social participation, and the subscale Effort (GSES-12) 32% of the variance for the physical health-related quality of life and 16% of the mental health-related quality of life. **CONCLUSION:** A significant number of adults with bilateral spastic cerebral palsy encountered difficulties in social participation and had a low perceived health-related quality of life for physical functions. Higher general self-efficacy or a greater willingness to expend effort in achieving behaviour was related to better participation and a higher physical and mental health-related quality of life.

PMID: 20549157 [PubMed - in process]

## 10. Neurosci Lett. 2010 May 26. [Epub ahead of print]

### Anticipatory postural muscle activity associated with bilateral arm flexion while standing in individuals with spastic diplegic cerebral palsy: a pilot study.

Tomita H, Fukaya Y, Honma S, Ueda T, Yamamoto Y, Shionoya K.

Department of Physical Therapy, Toyohashi SOZO University, Japan.

Compared to automatic postural responses to external perturbation, little is known about anticipatory postural adjustments in individuals with spastic diplegic cerebral palsy. In this study, we examined whether anticipatory activation of postural muscles would be observed before voluntary arm movement while standing in individuals with spastic diplegia. Seven individuals with spastic diplegia (SDCP(group), 12-22 years) and 7 age- and gender-matched individuals without disability (Control(group)) participated in this study. Participants performed bilateral arm flexion at maximum speed at their own timing while standing, during which electromyographic (EMG) activities of focal and postural muscles were recorded. In both groups, the erector spinae (ES) and medial hamstring (MH) muscles were activated in advance of the anterior deltoid muscle (AD), which is a focal muscle of arm flexion. Although start times of ES and MH with respect to AD were similar in the 2 groups, increases in EMG amplitudes of ES and MH in the anticipatory range from -150ms to +50ms, with respect to burst onset of AD, were significantly smaller in the SDCP (group) than in the Control(group). These findings suggest that individuals with spastic diplegia have the ability to anticipate the effects of disturbance of posture and equilibrium caused by arm movement and to activate postural muscles in advance of focal muscles. However, it is likely that the anticipatory increase in postural muscle activity is insufficient in individuals with spastic diplegia. Copyright © 2010. Published by Elsevier Ireland Ltd.

PMID: 20553807 [PubMed - as supplied by publisher]

**11. J Rehabil Med. 2010 May;42(5):493-8.****Manual ability and its relationship with daily activities in adolescents with cerebral palsy.**

van Eck M, Dallmeijer AJ, van Lith IS, Voorman JM, Becher J.

Department of Rehabilitation Medicine, VU University Medical Center, 1007 MB Amsterdam, The Netherlands.  
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**OBJECTIVE:** To describe the manual ability of adolescents with cerebral palsy and to investigate the relationship of manual ability with daily activities. **DESIGN:** Cross-sectional study. **SUBJECTS:** Ninety-four adolescents with cerebral palsy, aged 12-16 years. **METHODS:** Manual ability was assessed according to the Manual Ability Classification System (MACS) and the ABILHAND-Kids. Daily activities were assessed with the Vineland Adaptive Behavior Scales (VABS) sub-scales for (personal and domestic) daily living skills. The relationship between manual ability and daily activities was investigated with regression analysis: independent variables were manual ability, disease and personal characteristics. **RESULTS:** MACS and ABILHAND-Kids were both strongly associated with personal daily activities (explained variance 77% and 84%, respectively) and less strongly with domestic daily activities (explained variance 45% and 62%, respectively). Including other disease characteristics and personal characteristics in the model increased the explained variance of personal daily activities to 91% for both models and the explained variance of domestic daily activities to 68% and 73% for the MACS and ABILHAND-Kids models, respectively. **CONCLUSION:** Manual ability is limited in many adolescents with cerebral palsy, and limitations in manual ability are strongly related to limitations in daily activities.

PMID: 20544163 [PubMed - in process]

**12. Rev Lat Am Enfermagem. 2010 Mar-Apr;18(2):149-55.****Relation Between Quality of Life of Mothers of Children With Cerebral Palsy and the Children's Motor Functioning, After Ten Months of Rehabilitation.**

Prudente CO, Barbosa MA, Porto CC.

Universidade Católica de Goiás, Brazil.

This study aims to analyze the quality of life of mothers of children with cerebral palsy, correlated with the evolution of their children's gross motor function after ten months of rehabilitation. An observational, longitudinal study was carried out in Goiânia, Goiás, Brazil, involving 100 mothers and children with cerebral palsy. The children's motor function was evaluated using the Gross Motor Function Measure (GMFM) and the mothers' quality of life using the Medical Outcomes Study 36-item Short Form Health Survey (SF-36). After ten months of rehabilitation, the children's gross motor function had significantly improved ( $p < 0.001$ ), while the mothers only presented a significant improvement ( $p < 0.001$ ) in the bodily pain domain. The improvement in the motor function of children with cerebral palsy did not influence the changes in the mothers' quality of life.

PMID: 20549111 [PubMed - in process]Free Article

**13. Vestn Khir Im I I Grek. 2010;169(2):57-60.****Treatment of contractures of the lower extremity joints in patients with infantile cerebral palsy against the background of prolonged epidural blockad [Article in Russian]**

[No authors listed]

The authors describe specific effects of prolonged epidural blockade in treatment of contractures of the lower extremity joints in children with cerebral palsy. The method was used in 5 patients aged from 11 to 16 years. The prolonged epidural blockade during 4-5 weeks allowed adequate motor rehabilitation and conditions for learning to walk.

PMID: 20552792 [PubMed - in process]

**14. Zh Nevrol Psikhiatr Im S S Korsakova. 2010;110(6):37-43.****Foot deformity in children with spastic forms of cerebral palsy: the treatment with botulinum toxin type A (disport). [Article in Russian]**

Kurenkov AL, Dutikova EM, Nikitin SS, Artemenko AR.

Nauchnyĭ tsentr zdorov'ia deteĭ RAMN, Moskva.

The objective is to study the effect of disport injections on the clinical and electromyographic changes in 35 patients (mean age 5,3+/-2,0 years) with spastic forms of cerebral palsy (26 with spastic diplegia, 9 with hemiparetic form) with equinus and equinovarus deformity. Depending on the clinical situation, disport was injected in a total dose of 20-30 u per 1 kg of the body mass. Gastrocnemius muscles were injected more frequently than soleus and posterior tibial muscles. The treatment resulted in the significant reduction of spasticity on the Ashworth scale, decrease of equinus deformity, positive changes in the parameters of stepping on flat foot, independent standing and walking, the beginning of support period from the heel. During the arbitrary contraction, the amplitude of bioelectrical activity of target muscles of low extremities reduced, though not to the extent of the motor activity loss; the reciprocity coefficient decreased from 0,69+/-0,32 to 0,47+/-0,28 in patients with spastic diplegia and from 0,45+/-0,34 to 0,34+/-0,25 in patients with hemiparetic form. The effect of disport was higher in hemiparetic form compared to spastic diplegia. The best results for spastic diplegia were revealed in patients with isolated spasticity without severe disturbances of reciprocal relations in shin muscles and pathological synkinesia.

PMID: 20559272 [PubMed - as supplied by publisher]

## 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.*

**15. Hum Reprod. 2010 Jun 16. [Epub ahead of print]****Multiplicity and early gestational age contribute to an increased risk of cerebral palsy from assisted conception: a population-based cohort study.**

Hvidtjørn D, Grove J, Schendel D, Sværke C, Schieve LA, Uldall P, Ernst E, Jacobsson B, Thorsen P.

Institute of Public Health, Department of Epidemiology, University of Aarhus, 8000 Aarhus, Denmark.

**BACKGROUND** This paper assesses the risk of cerebral palsy (CP) in children born after assisted conception compared with children born after natural conception (NC). **METHODS** This population based follow-up study included all 588,967 children born in Denmark from 1995 to 2003. Assisted conception was defined as IVF, with or without ICSI, and ovulation induction (OI), with or without subsequent insemination. **RESULTS** There were 33 139 (5.6%) children born in Denmark from 1995 to 2003 as a result of assisted conception and through to June 2009, 1146 (0.19%) children received a CP diagnosis. Children born after assisted conception had an increased risk of a CP diagnosis, crude hazard rate ratio (HRR) 1.90 (95% CI: 1.57-2.31) compared with NC children. Divided into IVF and OI children compared with NC children, the risk was HRR 2.34 (95% CI: 1.81-3.01) and HRR 1.55 (95% CI: 1.17-2.06), respectively. When we included the intermediate factors multiplicity and gestational age in multivariate models, the risk of CP in assisted conception disappeared. In general, children with CP born after assisted conception had similar CP subtypes and co-morbidities as children with CP born after NC. **CONCLUSION** The risk of CP is increased after both IVF and OI. The increased risk of CP in children born after assisted conception, and in particular IVF, is strongly associated with the high proportion of multiplicity and preterm delivery in these pregnancies. A more widespread use of single embryo transfer warrants consideration to enhance the long-term health of children born after IVF.

PMID: 20554642 [PubMed - as supplied by publisher]

**16. Arch Dis Child. 2010 Jun 15. [Epub ahead of print]****Mortality from 1 to 16-18 years in bilateral cerebral palsy.**

Baird G, Allen E, Scrutton D, Knight A, McNee A, Will E, Elbourne D.

Newcomen Centre, Guy's and St Thomas' NHS Trust, London, UK.

Objective: To ascertain mortality from 1 to 18 years, and predictors of mortality. Design: Long-term follow-up of population cohort born 1989-1992. Setting Births in South East Thames Region. Patients 346 children with bilateral cerebral palsy (CP). Interventions Not applicable. Main outcome measures Mortality; predictors of mortality. Results: 98% of the cohort were traced. 61/340 (17.9%) had died by age 16-18 years at a steady mortality. The main predictive factor was severity of impairment of functional ability (hazard ratio 5.7, 95% CI 2.1 to 15.0 for poor hand manipulation; 6.8 (1.9 to 23.9).for severe communication problems). Conclusions: Although there were deaths throughout the childhood and teenage years, the majority of children with bilateral CP are likely to survive to adulthood, especially if they do not have major functional impairment at 2 years. This confirms findings of other studies of children with CP.

PMID: 20551190 [PubMed - as supplied by publisher]

**17. J Pediatr. 2010 Jun 12. [Epub ahead of print]****Seizures in Extremely Low Birth Weight Infants Are Associated with Adverse Outcome.**

Davis AS, Hintz SR, Van Meurs KP, Li L, Das A, Stoll BJ, Walsh MC, Pappas A, Bell EF, Laptook AR, Higgins RD; Eunice Kennedy Shriver National Institute of Child Health and Human Development Neonatal Research Network.

Division of Neonatal-Developmental Medicine, Stanford University, Stanford, CA.

OBJECTIVE: To examine risk factors for neonatal clinical seizures and to determine the independent association with death or neurodevelopmental impairment (NDI) in extremely low birth weight (ELBW) infants. STUDY DESIGN: A total of 6499 ELBW infants (401-1000 g) surviving to 36 weeks postmenstrual age (PMA) were included in this retrospective study. Unadjusted comparisons were performed between infants with (n = 414) and without (n = 6085) clinical seizures during the initial hospitalization. Using multivariate logistic regression modeling, we examined the independent association of seizures with late death (after 36 weeks PMA) or NDI after controlling for multiple demographic, perinatal, and neonatal variables. RESULTS: Infants with clinical seizures had a greater proportion of neonatal morbidities associated with poor outcome, including severe intraventricular hemorrhage, sepsis, meningitis, and cystic periventricular leukomalacia (all P < .01). Survivors were more likely to have NDI or moderate-severe cerebral palsy at 18 to 22 months corrected age (both P < .01). After adjusting for multiple confounders, clinical seizures remained significantly associated with late death or NDI (odds ratio, 3.15; 95% CI, 2.37-4.19). CONCLUSION: ELBW infants with clinical seizures are at increased risk for adverse neurodevelopmental outcome, independent of multiple confounding factors. Copyright © 2010 Mosby, Inc. All rights reserved.

PMID: 20542294 [PubMed - as supplied by publisher]

**18. Exp Neurol. 2010 Jun 11. [Epub ahead of print]****Hematopoietic stem cell transplantation protects mice from lethal stroke.**

Felfly H, Muotri A, Yao H, Haddad GG.

University of California San Diego, School of Medicine, Departments of Pediatrics.

Stroke is a major cause of mortality and morbidity in the United States. The ideal therapeutic approach would minimize cell death and regenerate brain tissue. In order to investigate some questions that are related to such an approach, we have generated a mouse model in which we induce a stroke using the Middle Cerebral Artery Occlusion method. After 2h occlusion followed by reperfusion, 99% of mice died within 8days of stroke. Total bone marrow cell transplantation by intravenous injection revealed an optimal timing of cell transfer in two doses on days 1 (same

day of surgery) and 2 after surgery. Moreover, intravenous injection of Sca1+ bone marrow cells (enriched in hematopoietic stem cells) showed a dose-response effect on survival. Surviving mice also had no signs of apparent paralysis or weakness. Tracking analysis using donor stem cells expressing LacZ revealed only few donor cells in the brain. We conclude that hematopoietic stem cell-rich Sca1+ bone marrow cell transplantation after stroke protects the brain of a sizeable portion of mice subjected to stroke and alleviate remarkably the resulting neurological morbidity in surviving mice. Copyright © 2010. Published by Elsevier Inc.

PMID: 20547154 [PubMed - as supplied by publisher]

## 19. Early Hum Dev. 2010 Jun 7. [Epub ahead of print]

### Predictability of cerebral palsy in a high-risk NICU population.

Himpens E, Oostra A, Franki I, Vansteelandt S, Vanhaesebrouck P, den Broeck CV.

Rehabilitation Sciences and Physiotherapy Ghent, University College Arteveldehogeschool-Ghent University, Ghent, Belgium.

AIM: This study aims to create a predictive model for the assessment of the individual risk of developing cerebral palsy in a large cohort of selected high-risk infants. PATIENTS AND METHODS: 1099 NICU-admitted high-risk infants were assessed up to the corrected age of at least 12 months. CP was categorized relative to subtype, distribution and severity. Several perinatal characteristics (gender, gestational age, multiple gestation, small for gestational age, perinatal asphyxia and duration of mechanical ventilation), besides neonatal cerebral ultrasound data were used in the logistic regression model for the risk of CP. RESULTS: Perinatal asphyxia, mechanical ventilation > 7 days, white matter disease except for transient echodensities < 7 days, intraventricular haemorrhage grades III and IV, cerebral infarction and deep grey matter lesions were recognized as independent predictors for the development of CP. 95% of all children with CP were correctly identified at or above the cut-off value of 4.5% probability of CP development. Higher gestational age, perinatal asphyxia and deep grey matter lesion are independent predictors for non-spastic versus spastic CP (OR=1.1, 3.6, and 7.5, respectively). Independent risk factors for prediction of unilateral versus bilateral spastic CP are higher gestational age, cerebral infarction and parenchymal haemorrhagic infarction (OR=1.2, 31, and 17.6, respectively). Perinatal asphyxia is the only significant variable retained for the prediction of severe CP versus mild or moderate CP. CONCLUSION: The presented model based on perinatal characteristics and neonatal US-detected brain injuries is a useful tool in identifying specific infants at risk for developing CP. Copyright © 2010 Elsevier Ltd. All rights reserved.

PMID: 20542648 [PubMed - as supplied by publisher]

## 20. Nucleosides Nucleotides Nucleic Acids. 2010 Jun;29(4-6):295-300.

### Partial HPRT deficiency phenotype and incomplete splicing mutation.

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Deficiency of hypoxanthine-guanine phosphoribosyltransferase (HPRT) activity is an inborn error of purine metabolism associated with uric acid overproduction and a continuum spectrum of neurological manifestations depending on the degree of enzyme deficiency. The complete deficiency causes Lesch-Nyhan syndrome (LNS). Partial HPRT-deficient patients can show a variable degree of neurological manifestations. Both diseases have been associated with mutations in the HPRT1 gene. Documented mutations in HPRT deficiency show a high degree of heterogeneity in type and location within the gene. In fact, more than 300 disease-associated mutations have been described. Splice mutations accounts for more than 16% of HPRT mutations and in most cases cause a complete LNS phenotype. A 16 year-old boy consulted to La Paz University Hospital because of hyperuricemia (9.4 mg/dL). At age one year he was given a diagnosis of dystonic cerebral palsy. Although he usually employs a wheelchair, under certain circumstances, he is able to stand up and walk by himself. He has never showed self injurious behavior. This patient presented a splice mutation (NM\_000194.2: c.552 -2 A > G) causing exon 5 exclusion. An exon-5 specific PCR was designed, and a minor amount of normally spliced HPRT mRNA was found. Normally spliced HPRT

mRNA was quantified by real-time PCR in this patient, in control subjects, and in two Lesch Nyhan patient with splice mutations excluding exon 4 (patient B) and exon 8 (patient C) who had clinically a Lesch Nyhan disease phenotype. A minor amount of normally spliced HPRT mRNA was found in all the patients. No correlation was found between the percentage of the normally spliced HPRT mRNA and the phenotype. We conclude that the partial HPRT deficient phenotype of this patient can not be explained by the finding of a minor amount of normally splice HPRT mRNA. It is possible that the amount of normally splice mRNA vary among different tissues.

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## **21. Mol Cell Neurosci. 2010 May;44(1):43-54. Epub 2010 Feb 14.**

### **High content screening of cortical neurons identifies novel regulators of axon growth.**

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Neurons in the central nervous system lose their intrinsic capacity for axon regeneration as they mature, and it is widely hypothesized that changes in gene expression are responsible. Testing this hypothesis and identifying the relevant genes has been challenging because hundreds to thousands of genes are developmentally regulated in CNS neurons, but only a small subset are likely relevant to axon growth. Here we used automated high content analysis (HCA) methods to functionally test 743 plasmids encoding developmentally regulated genes in neurite outgrowth assays using postnatal cortical neurons. We identified both growth inhibitors (Ephexin, Aldolase A, Solute Carrier 2A3, and Chimerin), and growth enhancers (Doublecortin, Doublecortin-like, Kruppel-like Factor 6, and CaM-Kinase II gamma), some of which regulate established growth mechanisms like microtubule dynamics and small GTPase signaling. Interestingly, with only one exception the growth-suppressing genes were developmentally upregulated, and the growth-enhancing genes downregulated. These data provide important support for the hypothesis that developmental changes in gene expression control neurite outgrowth, and identify potential new gene targets to promote neurite outgrowth. Copyright 2010 Elsevier Inc. All rights reserved.

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## **22. Hum Reprod. 2010 Apr;25(4):1082-4. Epub 2010 Jan 29.**

### **A complicated IVF twin pregnancy.**

Bewley S, Moth P, Khalaf Y.

PMID: 20118115 [PubMed - indexed for MEDLINE]