



CEREBRAL PALSY | INSTITUTE

# CP Research News

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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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## 1: Child Care Health Dev. 2008 Sep 10. [Epub ahead of print]

### **Mealtime interaction patterns between young children with cerebral palsy and their mothers: characteristics and relationship to feeding impairment.**

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**Background:** A significant proportion of children with cerebral palsy have some degree of feeding impairment, which not only affects their ability to obtain adequate nourishment, but may also impinge on their ability to interact with their mothers during mealtimes. The quality of the maternal-child interaction may also be affected by the mealtime being prolonged and/or stressful. Patterns of interaction between mothers and their children with cerebral palsy have typically been described in play situations. There is limited information about interaction during mealtimes. The purpose of this study therefore, was to observe and describe the characteristics of mealtime interaction between mothers and their young children with cerebral palsy, and to determine whether feeding impairment and other sample characteristics were related to interaction patterns. **Methods:** The participants were 20 mothers and their children with cerebral palsy. Physical, cognitive, and feeding abilities varied. Video recordings of each mother-child dyad interacting during a typical mealtime were analysed in order to describe the structure of the interaction, the communicative functions used, and what method the children used to communicate. The characteristics of the interaction were summarized and compared and the relationship between feeding ability and other child factors and interaction patterns were explored. **Results:** Results revealed that interactions were maternally dominated. Mothers produced most of the communicative behaviour during the mealtime and used more directive functions than their children. The severity of feeding impairment was related to child patterns of interaction, but not to maternal interaction patterns. Language delay was also related to interaction patterns. **Conclusions** The results of this study highlight the importance for professionals to consider mealtime interactions for children with cerebral palsy and their mothers as an integral part of feeding investigations and ongoing interventions, as feeding impairment does seem to have a bearing on aspects of interaction.



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PMID: 18785971 [PubMed - as supplied by publisher]

## **2: Gait Posture. 2008 Sep 9. [Epub ahead of print]**

### **The effect of lower extremity selective voluntary motor control on interjoint coordination during gait in children with spastic diplegic cerebral palsy.**

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Damage to motor tracts in the periventricular white matter is a primary etiology in spastic diplegic cerebral palsy (CP). These tracts are responsible for the production of selective voluntary motor control (SVMC). Lower extremity motor control has been suggested as being an important predictor of improvement following interventions. While there are multiple impairments in spastic CP, the inability to perform purposeful voluntary movement is a critical factor in determining functional ability that merits investigation. The purpose of this study was to examine the relationship between SVMC ability and hip and knee coordination during the swing phase of gait in participants with spastic CP. Gait analysis and SVMC assessments were conducted for 15 participants with CP. Relative phase analysis was used to calculate the minimum relative phase (MRP) angle during swing; a measurement of interjoint coordination between the hip and the knee. SVMC ability was measured using the Selective Control Assessment of the Lower Extremity (SCALE) tool. Significant correlations were found between SCALE scores and both MRP values ( $p < 0.0001$ ) and duration of out-of-phase movement ( $p < 0.005$ ) during swing. These findings supported our hypothesis that SVMC ability is related to a patient's ability to move in an uncoupled pattern during the swing phase of gait (i.e., extending the knee while flexing the hip). An understanding of influence of SVMC on swing phase gait mechanics may help establish appropriate goals for interventions, in particular hamstring lengthenings.

PMID: 18786827 [PubMed - as supplied by publisher]

## **3: Eur J Obstet Gynecol Reprod Biol. 2008 Sep 8. [Epub ahead of print]**

### **Preterm birth and inflammation-The role of genetic polymorphisms.**

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Spontaneous preterm labour and preterm births are still the leading cause of perinatal morbidity and mortality in the developed world. Previous efforts to prevent preterm birth have been hampered by a poor understanding of the underlying pathophysiology, inadequate diagnostic tools and generally ineffective therapies. Clinical, epidemiological and experimental studies indicate that genito-urinary tract infections play a critical role in the pathogenesis of preterm birth. Moreover, intrauterine infection increases perinatal mortality and morbidity, such as cerebral palsy and chronic lung disease, significantly. It has recently been suggested that gene-environment interactions play a significant role in determining the risk of preterm birth. Polymorphisms of certain critical genes may be responsible for a harmful inflammatory response in those who possess them. Accordingly, polymorphisms that increase the magnitude or the duration of the inflammatory response were associated with an increased risk of preterm birth. In contrast polymorphisms that decrease the inflammatory response were associated with a lower risk of preterm birth. This article will review the current understanding of pathogenetic pathways in the aetiology of preterm birth.

PMID: 18783866 [PubMed - as supplied by publisher]

**4: Eur J Paediatr Neurol. 2008 Sep 6. [Epub ahead of print]**

**Management of motor problems in cerebral palsy: A critical update for the clinician.**

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Currently there is no specific treatment for the brain insults leading to motor dysfunction in cerebral palsy. The available symptomatic therapeutic options place cerebral palsy among the costliest chronic childhood conditions. Therefore, it is necessary to make well-informed decisions in an effort to match cost-effectiveness with patient and family needs. This presentation aims to analyze the efficacy of rehabilitation therapy, orthoses, oral medications, botulinum toxin, intrathecal baclofen, complementary or alternative treatments and discuss guidelines for a goal oriented approach. Despite insufficient reporting of trials, physiotherapy has shifted from traditional to goal oriented approaches, based on principles of motor learning, strength and fitness training. Correct choice and use of orthoses is stressed, yet evidence from primary studies is limited. Pharmacological treatments of spasticity (oral agents, botulinum toxin, intrathecal baclofen) may be alternatives or supplements to orthopaedic surgery. There is evidence that botulinum toxin combined with conservative treatments reduces the number of complex orthopaedic interventions. Intrathecal baclofen effectively reduces spasticity; criteria describing the ideal candidate are needed. Complementary or alternative treatment use is widespread; research needs to determine what factors make these modalities desirable and effective in cerebral palsy. It is concluded that the introduction of new therapies facilitates an individualized management plan. Multimodal treatment is optimized with a multidisciplinary team. Outcome measurement according to the World Health Organization's new International Classification of Functioning, Disability and Health is emphasized.

PMID: 18778959 [PubMed - as supplied by publisher]

**5: Neonatology. 2008 Sep 6;95(2):172-178. [Epub ahead of print]**

**Decreased Use of Postnatal Corticosteroids in Extremely Preterm Infants without Increasing Chronic Lung Disease.**

Seth R, Gray PH, Tudehope DI.

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Background: Postnatal corticosteroids are effective in preventing chronic lung disease in preterm infant. There are concerns that corticosteroid use may be associated with an increased risk of impaired neurodevelopment. Objective: To examine the effect of change in practice with the use of postnatal corticosteroids over an 8-year period in extremely preterm babies on the incidence of chronic lung disease (CLD) and cerebral palsy at 1 year of age. Methods: Babies of birth weight <1,000 g or gestational age <28 weeks admitted from 1997 to 2004 were included in this retrospective analysis. The study period was divided into two eras: group 1: 1997-2000, group 2: 2001-2004. Data were collected from the neonatal database, individual records and from the Growth and Development Unit. The outcome measure of CLD was defined as oxygen dependency at 36 weeks postmenstrual age. Data for postnatal corticosteroid usage were collected for the number of babies per year, and total dose. Results: 389 group 1 babies were compared to 368 group 2 babies. There was a significant decrease in the use of dexamethasone from 27% in group 1 to 13% in group 2 ( $p = 0.0001$ ), and total dose - mg/kg ( $4.5 \pm 2.9$  vs.  $2.6 \pm 1.6$ ,  $p = 0.0001$ ). The incidence of CLD and need for home oxygen was similar between groups. The incidence of cerebral palsy reduced from 10.4% in group 1 to 6.6% in group 2, though this was not statistically significant (OR 0.63; 95% CI 0.3, 1.2.). Conclusion: Decreased postnatal corticosteroid use had no impact on the incidence of CLD or need for home oxygen therapy. The trend towards a reduced rate of cerebral palsy requires further investigation. Copyright © 2008 S. Karger AG, Basel.

PMID: 18776732 [PubMed - as supplied by publisher]

**6: Rev Chir Orthop Reparatrice Appar Mot. 2008 Sep;94(5):443-8. Epub 2008 Feb 25.**

**Informative value of the popliteal angle in walking cerebral palsy children. [Article in French]**

Louis ML, Viehweger E, Launay F, Loundou AD, Pomero V, Jacquemier M, Jouve JL, Bollini G.

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**PURPOSE OF THE STUDY:** In clinical practice, it is generally accepted that hamstring tightness results in incomplete knee extension when the hip is in flexion and in smaller conventional and modified popliteal angles. Similarly, a difference between the conventional popliteal angle and the modified popliteal angle (popliteal differential) would be associated with a permanent deficit in knee extension. The purpose of this study was to determine whether these two hypothesis correlate with clinical findings. **MATERIAL AND METHODS:** The series was composed of 35 walking cerebral palsy children, 16 girls and 19 boys, mean age 11+/-3.6 years with a pathological conventional popliteal angle. These children walked using the jump knee (n=24) or the crouch knee (n=11) pattern. Permanent hip flexion and the conventional and modified popliteal angles were noted. SPSS version 10.1.3 for Window was used to search for a correlation between the popliteal differential and the presence of permanent hip flexion using several values for the popliteal differential (5, 10, 15, 20, and 30 degrees ). Data were adjusted for age and gender. **RESULTS:** The statistical analyses demonstrated a significant relationship between the presence of permanent hip flexion and a popliteal differential strictly less than 10 degrees and between the absence of permanent hip flexion and a popliteal angle greater or equal to 10 degrees . These statistically significant results, which demonstrated the opposite of what was expected, were independent of age and gender. **DISCUSSION:** Our findings demonstrate that examination of the knee joint is indispensable but insufficient. The conventional popliteal angle is not a reliable indicator of hamstring tightness. The normal value of the modified popliteal angle has not been established so that it is impossible to determine what a pathological angle is. We do not know whether measurement of this angle is sufficient to establish indications for surgery. In the future, the development of muscle models coupled with gait analysis should enable more reliable prediction of outcome after surgery. At the present time, we recommend repeated physical examination using a standardized protocol, taking into consideration, several parameters including spasticity, selectivity and muscle force and to perform quantified gait analysis before scheduling hamstring lengthening surgery for walking cerebral palsy children.

Publication Types:  
English Abstract

PMID: 18774018 [PubMed - in process]

**7: Neurotoxicology. 2008 Aug 3. [Epub ahead of print]**

**Neurotoxicological effects of 3-nitropropionic acid on the neonatal rat.**

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An increasing amount of data provides support for the hypothesis that periventricular leukomalacia (PVL) results from pre- or perinatal hypoxia occurring and is a major cause of cerebral palsy. In this work, anoxic and hypoxic-ischemic brain injuries were observed by us, after injection of neurotoxin 3-nitropropionic acid (3-NP) in a neonatal rat model on postnatal day 5 (P5). 3-NP-induced brain injury was examined in fixed brain sections at 24h (P6), 48h (P7), 72h (P8), and 9 days (P14) after 3-NP injection, respectively. Injection with 3-NP results in pathological injuries including white matter lesions, cerebral cortex destruction, callose thinness, and cerebral ventricle expansion. Numbers of immature oligodendrocytes turned to less in the model of 3-NP. Furthermore myeline basic protein expression became sig-

nificantly lower after 3-NP was injected. Pathological changes after injection of 3-NP appeared also significantly among rats of postnatal day 5. The effect of the 3-NP neurotoxicity paradigm was evaluated in this study to further investigate the underlying pathology associated with PVL, which may yield a potential desirable model for clinic experiments.

PMID: 18775747 [PubMed - as supplied by publisher]

**8: J Obstet Gynaecol Can. 2008 Aug;30(8):659-664.**

**Amniocentesis for PPROM Management: A Feasibility Study.**

Lacerte M, Bujold E, Audibert F, Mayrand MH.

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**Objective:** In Canada, most mothers whose amniotic membranes rupture before 34 weeks' gestation are hospitalized and delivered when signs of chorioamnionitis or fetal distress are observed or when a pre-determined gestational age between 34 and 37 weeks is reached. This management approach can be questioned because in utero exposure to infection is a risk factor for cerebral palsy in neonates. Amniocentesis has the potential to detect markers of intra-amniotic infection. Our objective was to determine the acceptability of a randomized study comparing expectant management with amniocentesis-based management in women with premature rupture of the membranes. **Methods:** Between November 2005 and January 2007, we conducted a qualitative study involving 40 patients admitted to a tertiary care centre with premature rupture of the membranes between 28 and 34 weeks. The participants read an information booklet and answered a questionnaire. They were asked if they would agree to participate in a randomized study comparing expectant management with amniocentesis-based management. They graded the importance of a series of statements in their decision-making process. **Results:** Seventy percent (28/40) of patients would have participated in the proposed study. Determining the presence of amniotic fluid infection or lung maturity was the main reason motivating their choice. The reasons for refusing to participate were related to complications of amniocentesis (fetal trauma, iatrogenic preterm labour, infection, or pain). **Conclusion:** The majority of patients with premature rupture of the membranes would participate in a study comparing expectant management to management based on amniocentesis results. This study helped us to better understand their motivations and fears.

PMID: 18786287 [PubMed - as supplied by publisher]

**9: Dev Neurorehabil. 2008 Jul-Sep;11(3):236-40.**

**Exercise is brain food: The effects of physical activity on cognitive function.**

Ploughman M.

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This commentary reviews selected biomedical and clinical research examining the relationship between physical exercise and cognitive function especially in youth with disability. Youth with physical disability may not benefit from the effects of exercise on cardiovascular fitness and brain health since they are less active than their non-disabled peers. In animal models, physical activity enhances memory and learning, promotes neurogenesis and protects the nervous system from injury and neurodegenerative disease. Neurotrophins, endogenous proteins that support brain plasticity likely mediate the beneficial effects of exercise on the brain. In clinical studies, exercise increases brain volume in areas implicated in executive processing, improves cognition in children with cerebral palsy and enhances phonemic skill in school children with reading difficulty. Studies examining the intensity of exercise required to optimize neurotrophins suggest that moderation is important. Sustained increases in neurotrophin levels occur with prolonged low intensity exercise, while higher intensity exercise, in a rat model of brain injury, elevates the stress hormone, corticosterone. Clearly, moderate physical activity is important for youth

whose brains are highly plastic and perhaps even more critical for young people with physical disability.

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