

Monday 1 March 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. *J Pediatr Orthop.* 2010 Mar;30(2):212.

#### **The identification and treatment of gait problems in cerebral palsy, 2nd edition.**

Wenger DR.

Rady Children's Hospital-San Diego, San Diego, CA.

PMID: 20179573 [PubMed - in process]

### 2. *J Pediatr Orthop.* 2010 Mar;30(2):174-9.

#### **Static and dynamic gait parameters before and after multilevel soft tissue surgery in ambulating children with cerebral palsy.**

Bernthal NM, Gamradt SC, Kay RM, Wren TA, Cuomo AV, Reid J, Bales J, Otsuka NY.

\*University of California Los Angeles Medical Center daggerChildrens Orthopaedic Center, Childrens Hospital Los Angeles double daggerShriners' Hospital for Children Los Angeles, CA.

**BACKGROUND:** Recent studies have questioned the efficacy of releasing hip flexion contractures and the resulting ankle position after tendoachilles lengthening in ambulating children with cerebral palsy (CP). **METHODS:** Twenty-three ambulatory children with CP underwent 96 soft tissue-lengthening procedures without bony surgery. Preoperative and postoperative clinical and computerized gait data were reviewed. **RESULTS:** Static contractures improved reliably, with improvements in all areas measured, including hip flexion contracture (14 degree improvement), hip abduction (19 degree improvement), popliteal angle (26 degree improvement), and ankle dorsiflexion (11 degree improvement). The changes in computerized gait data were less uniform. The knees showed significant benefits, as evidenced by improved maximal knee extension in stance phase (37.3 degree preop and 19.9 degree postop) and at initial contact (51.6 degree preop and 34.8 degree postop). At the hip, a statistically significant improvement was only seen in maximum hip extension in stance phase (minimum hip flexion), and the magnitude of this change was only 4.6 degree (15.3 to 10.7 degree). There were no significant changes at the pelvis. At the ankle, the tendency was toward calcaneal gait after Achilles tendon lengthening, with excessive dorsiflexion seen both in stance (17.3 degree) and at toe off (-6.9 degree). Temperospatial parameters showed improved stride length, but no significant changes in gait velocity or cadence. **DISCUSSION:** The persistence of crouch postoperatively, though improved, likely limited the potential changes in hip kinematics. As this study excluded patients undergoing osseous surgery, it is possible that lever arm dysfunction may have contributed to the ongoing crouch. The results of this study suggest that static contractures and knee kinematics improve reliably after soft tissue surgery in children with CP, but that caution must be exercised when considering heel cord lengthening in these children. **LEVEL OF EVIDENCE:** Therapeutic level II. See Instructions to Authors for a complete description of levels of evidence.

PMID: 20179566 [PubMed - in process]

### 3. J Rehabil Med. 2010 Feb 24. doi: 10.2340/16501977-0522. [Epub ahead of print]

#### **Effect of shock wave stimulation on hypertonic plantar flexor muscles in patients with cerebral palsy: A placebo-controlled study.**

Amelio E, Manganotti P.

**Background:** Extracorporeal shock wave therapy has been reported to be effective in reducing muscle hypertonia in adults. **Aim:** To evaluate the effect of shock wave treatment of spastic muscles in children with cerebral palsy. **Methods:** Twelve children with spastic equinus foot (6 boys, 6 girls; mean age 8 years (standard deviation (SD) 2.31)) were monitored. Clinical (Ashworth Scale, passive range of motion) and instrumental (pedobarography) examination were performed. This is an open study with one placebo treatment session, followed 6 weeks later by one active shock wave treatment session. Gastrocnemius muscles and soleus muscles were treated. **Results:** After placebo stimulation no clinical or instrumental effect was seen. After a single active shock wave stimulation a significant decrease in the Ashworth Scale (from 3 to 2), an increase in the range of motion (from 20 degrees to 50 degrees), and an increase in the whole plantar surface area of the treated limb (from 40.3 to 80.2 cm<sup>2</sup>) were observed in all patients. This effect lasted for 4 weeks in all patients. **Conclusions:** A single active shock wave stimulation produced a significant long-lasting reduction in hypertonia in the plantar flexors in children with cerebral palsy.

PMID: 20182677 [PubMed - as supplied by publisher]

### 4. Acta Orthop. 2010 Feb 22. [Epub ahead of print]

#### **Changes in lower limb rotation after soft tissue surgery in spastic diplegia.**

Lofterød B, Terjesen T.

Section for Child Neurology, Norway.

**Background and purpose:** Rotational osteotomies are usually necessary to correct pronounced rotational deformities in ambulant children with cerebral palsy. The effects of soft tissue surgery on such deformities are unclear. In this retrospective study, we determined whether multilevel soft tissue surgery, performed to correct deformities in the sagittal plane, would also have an effect on rotational parameters. **Patients and methods:** We examined 28 ambulant children with spastic diplegia with an average age of 12 (7-19) years. They underwent multilevel soft tissue surgery (with 6 surgical procedures per child on average). 3-dimensional gait analysis was performed preoperatively and at an average follow-up of 1-2 years. The indications for surgery were abnormalities in the sagittal plane. Gait analysis data from healthy children were used in defining normal ranges of kinematic variables. For assessment of changes in the transverse plane, the angles of foot progression, hip rotation, and pelvic rotation were studied. **Results:** The transverse plane kinematic results showed no statistically significant postoperative changes when the preoperative parameters were within the normal range (within 2 SD of the mean of the normal material). In limbs where the preoperative values were abnormal (more than 2 SD above the normal mean), there was a mean reduction in internal foot progression of 12 degrees ( $p = 0.01$ ) and a mean reduction in external pelvic rotation of 6 degrees ( $p = 0.02$ ). The effect was more pronounced in children under 12 years of age. Internal hip rotation was not significantly reduced. **Interpretation** When the preoperative rotational parameters were abnormal, multilevel soft tissue surgery resulted in improved transverse plane kinematics. This could be of importance in preoperative decision making, especially when there is doubt as to whether to include rotational osteotomies in multilevel operations in younger children.

PMID: 20175660 [PubMed - as supplied by publisher]

**5. Age Ageing. 2010 Feb 22. [Epub ahead of print]****Ageing with cerebral palsy: psychosocial issues.**

Horsman M, Suto M, Dudgeon B, Harris SR.

Department of Physical Therapy, University of British Columbia, 212-2177 Wesbrook Mall, Vancouver, British Columbia, V6T 1Z3, Canada.

**BACKGROUND:** although much has been written about biomedical concerns in adults ageing with cerebral palsy (CP), few studies or reviews have addressed psychosocial aspects. **OBJECTIVE:** the purpose of this narrative review is to critically examine studies that have addressed needs for social support, as well as issues affecting morale, self-efficacy, health attitudes, employment and sense of coherence (SOC) in adults ageing with CP. **DESIGN:** a systematic and detailed search of the literature was conducted. **METHODS:** searches of CINAHL (1982-present), ERIC, PubMed (1950-present), MEDLINE (Ovid) and Web of Science databases, as well as the American Academy of Cerebral Palsy and Developmental Medicine website, were conducted. Key search terms included 'cerebral palsy and ageing', 'adults with cerebral palsy', 'secondary conditions', 'functional loss', 'health' and 'psychosocial'. Nine studies were recovered that described psychosocial consequences of living with a lifespan disability. We used McMaster University's Guidelines for Critical Review Form - Quantitative and Qualitative Studies to evaluate the studies. **RESULTS:** psychosocial issues of concern to adults ageing with CP include the need for social support, self-acceptance and acceptance by others; the need for accommodations in the workplace and the environment; and SOC of adults ageing with CP. **CONCLUSIONS:** several studies concluded that adults with CP need greater knowledge and understanding to enhance decision-making processes about their health. The studies reviewed also provide knowledge for healthcare and social service providers who care for adults with CP to better understand how psychosocial health can be preserved during the ageing process.

PMID: 20178997 [PubMed - as supplied by publisher]

**6. Disabil Rehabil. 2010 Feb 23. [Epub ahead of print]****The psychosocial well-being of parents of children with cerebral palsy: a comparison study.**

Cheshire A, Barlow JH, Powell LA.

Faculty of Health and Life Sciences, Coventry University, Coventry, UK.

**Purpose.** Parents of children with cerebral palsy (CP) may be at risk from poor psychosocial well-being, compared with parents of children without a long-term health condition (LTHC). However, research has produced some conflicting findings on the topic and no comparison studies have been conducted in the UK. Furthermore, studies have only used measures of negative psychosocial well-being. The aim of this study was to conduct a comparative study of parents of children with CP and parents of children without a LTHC in the UK. **Method.** Seventy parents of children with CP and 70 parents of children without a LTHC completed self-administered questionnaires, comprising measures of psychosocial distress and positive psychosocial well-being. **Results.** This study demonstrated that parents of children with CP have significantly poorer psychosocial well-being compared with parents of children without a LTHC: parents of children with CP had lower satisfaction with life and higher levels of anxious and depressed mood. **Conclusions.** These results suggest caring for a child with CP may put parents at risk from poor psychosocial well-being. Interventions to improve parental well-being are urgently needed.

PMID: 20178413 [PubMed - as supplied by publisher]

**7. Disabil Rehabil. 2010 Feb 19. [Epub ahead of print]****Relationship between quality of life and functional status of young adults and adults with cerebral palsy.**

Tarsuslu T, Livanelioğlu A.

Abant Izzet Baysal University School of Physical Therapy and Rehabilitation, Bolu, Turkey.

**Purpose.** The aim of this study was investigate the relation between health related quality of life (HRQoL) and functional status in young adult or adult cerebral palsied individuals. **Methods.** The study included 45 cerebral palsied subjects who were divided into two groups as young adults (n = 21, group 1) and adults (n = 24, group 2), over the age 15 years. Gross Motor Function Classification System (GMFCS), Functional Independence Measurement (FIM), Physical Mobility Scale (PMS), Nottingham Health Profile (NHP), Visual Analogue Scale (VAS) were used as outcome measures. **Results.** In group 1, GMFCS and PMS scores were significantly correlated with total the total score of FIM ( $p < 0.05$ ). Although total FIM, PMS, LS and GMFCS scores were not correlated with the total NHP score ( $p > 0.05$ ), pain subscale of NHP was significantly correlated with self care and mobility subscales of FIM ( $p < 0.05$ ). Also, self care, mobility, locomotion subscales and total score of FIM were highly correlated with the physical activity subscale of NHP ( $p < 0.05$ ). In group 2, our findings were also similar to those of young adults when the relations between total NHP score and total FIM, PMS, LS and GMFCS were investigated ( $p > 0.05$ ) and also some subscales of FIM and NHP presented high correlations in between. In addition, there were significant differences between the groups in GMFCS, LS and locomotion and self care subscales of FIM ( $p < 0.05$ ). **Conclusion.** Although HRQoL in young cerebral palsied individuals seems to be more effected by parameters related to physical condition, in cerebral palsied adults psychological and emotional aspects may be more important indicators related to HRQoL. For that reasons, more population specific measures have to be developed for in-depth analysis of these factors.

PMID: 20170385 [PubMed - as supplied by publisher]

## 8. Disabil Rehabil. 2010 Feb 19. [Epub ahead of print]

### **Musculo-skeletal pain, quality of life and depression in mothers of children with cerebral palsy.**

Kaya K, Unsal-Delialioglu S, Ordu-Gokkaya NK, Ozisler Z, Ergun N, Ozel S, Ucan H.

Tatvan State Hospital, Ministry of Health, Bitlis, Turkey.

**Objective.** To evaluate musculoskeletal pain (MSP) in mothers of children with cerebral palsy (CP), and to determine the effects of zone of pain on health-related quality of life (QoL) and symptoms of depression. **Patients and methods.** The study included a total of 81 children with CP, together with their mothers (group 1), and a total of 60 healthy children, together with their mothers (group 2). Presence of MSP, and the zone of pain in mothers were evaluated [lower back pain (LBP), pain in other zones, without pain]. Mothers' QoL was assessed with Short Form-36 (SF-36) scale, and presence of symptoms of depression was assessed with Beck Depression Inventory (BDI). Multivariate analysis of variance test analysis was performed to see the main effects of the factors mother having a child with CP (group 1, group 2) and zone of pain (LBP, other, no pain) on the BDI scores and SF-36 QoL sub parameters of mothers. Logistic regression analysis was performed to determine the parameters predicting the presence of LBP in mothers in group 1. **Results.** MSP and LBP were found to be significantly higher in group 1. Main effect of the mother having a child with CP on BDI score and physical role (PR) and mental health (MH) parameters was found to be significant. Mean BDI scores of mothers in group 1 was found to be significantly higher as compared to the other group, and mean PR parameter and MH values were found to be significantly lower. Main effect of the zone of pain (arising from the group of mothers with LBP) was found to be significant on physical functioning, bodily pain, general health perception, MH parameters and BDI. Logistic regression analysis showed that MH and bodily pain parameters significantly predicted the presence of LBP. **Conclusion.** Deterioration of MH in mothers with cerebral palsied child may be causing them to experience more LBP. Experience of increased LBP causes deterioration of health-related QoL.

PMID: 20170278 [PubMed - as supplied by publisher]

## 9. J Neurosurg. 2010 Feb 19. [Epub ahead of print]

### **Successful bilateral deep brain stimulation of the globus pallidus internus for persistent status dystonicus and generalized chorea.**

Apetauerova D, Schirmer CM, Shils JL, Zani J, Arle JE.

The authors report the cases of 2 young male patients (aged 16 and 26 years) with dystonic cerebral palsy of unknown origin, who developed status dystonicus, an acute and persistent combination of generalized dystonia and

chorea. Both patients developed status dystonicus after undergoing general anesthesia, and in 1 case, after administration of metoclopramide. In attempting to control this acute hyperkinetic movement disorder, multiple medication trials failed in both cases and patients required prolonged intubation and sedation with propofol. Bilateral deep brain stimulation of the globus pallidus internus (4 and 2 months after the onset of symptoms in the first and second case, respectively) produced immediate resolution of the hyperkinetic movement disorder in each case. Deep brain stimulation provided persistent suppression of the dystonic movement potential after a follow-up of 30 and 34 months, respectively, as demonstrated by the reemergence of severe dystonia during the end of battery life of the implantable pulse generators that was readily controlled by exchange of the generators in each case.

PMID: 20170298 [PubMed - as supplied by publisher]

#### **10. Phys Occup Ther Pediatr. 2010 Feb;30(1):54-65.**

##### **Effects of prolonged standing on gait in children with spastic cerebral palsy.**

Salem Y, Lovelace-Chandler V, Zabel RJ, McMillan AG.

Yasser Salem, PhD, PT, NCS, PCS, is Assistant Professor, Division of Physical Therapy, Long Island University, Brooklyn, New York.

The purpose of this study was to determine the effects of prolonged standing on gait characteristics in children with spastic cerebral palsy. Six children with spastic cerebral palsy participated in this study with an average age of 6.5 years (SD = 2.5, range = 4.0-9.8 years). A reverse baseline design (A-B-A) was used over a 9-week period. During phase A, the children received their usual physical therapy treatment. During phase B, children received the prolonged standing program three times per week, in addition to their usual physical therapy treatment. During phase A2, children received their usual physical therapy treatment. Gait analysis and clinical assessment of spasticity were performed before and after each phase. Analysis of variance (ANOVA) for repeated measurements was used to test for changes in gait measures across the four measurement sessions. Friedman's was used to test for changes in muscle tone (Modified Ashworth Scale) across the four measurement sessions. Stride length ( $p < .001$ ), gait speed ( $p < .001$ ), stride time ( $p < .001$ ), stance phase time ( $p < .001$ ), double support time ( $p < .003$ ), muscle tone ( $p < .02$ ), and peak dorsiflexion angle during midstance ( $p < .004$ ) improved significantly following the intervention phase. The results of this study demonstrate that the gait pattern of children with cerebral palsy classified as level II or III on the Gross Motor Functional Classification System (GMFCS) improved by a prolonged standing program. However, these improvements were not maintained at 3 weeks. Further research is necessary with larger sample sizes to replicate these findings and determine specific "dosing" for standing programs to create long-lasting functional effects on gait.

PMID: 20170432 [PubMed - in process]

#### **11. J Pediatr Gastroenterol Nutr. 2009 Nov;49(5):584-8.**

##### **Indications for percutaneous endoscopic gastrostomy and procedure-related outcome.**

Srinivasan R, Irvine T, Dalzell M.

Department of Paediatric Gastroenterology, Alder Hey Children's NHS Foundation Trust, Eaton Road, Liverpool, UK. ramsriniv@doctors.org.uk

**OBJECTIVE:** To describe the indications and practice of percutaneous endoscopic gastrostomy (PEG) device insertion for nutritional support and to ascertain procedure-related complications and outcome. **METHODS:** Observational study with prospectively collected data on children who underwent PEG-related procedures (PEG insertion, removal, or change to low profile button devices [LPBD]) for a 5-year period (2002-2006) at our centre. **RESULTS::** Six hundred one PEG-related procedures were performed during the study period (384 insertions, 165 conversions to LPBD, 49 permanent PEG removals, and 3 PEG reinsertions). The main indications for PEG insertion were feeding difficulties associated with neurodisability (160/384; 41.6%) and congenital heart disease (CHD 115/384; 30%). Children with CHD required feeding nutritional support at an earlier age than children with neurodisability regardless of underlying cardiac condition. The age of PEG insertion was significantly different between the 2 main groups (neurodisability 3.56 years vs CHD 0.39 years;  $P < 0.001$  [t test]). Fifty-nine patients were discharged on the same

day as PEG insertion without complications (day case gastrostomy). The median time between PEG insertion to LPBD conversion was 0.83 year (0.12-3.86). Twenty-four of the 49 children having permanent PEG removal had CHD. CONCLUSIONS: Neurodisability and CHD were the main indications for PEG insertion, those with CHD requiring feeding support at an earlier age. Although CHD was an indication for PEG insertion in 30% of instances, a greater percentage of PEG removals (50%) were seen in this group indicating resolution of feeding difficulties.

PMID: 19820413 [PubMed - indexed for MEDLINE]

## **12. Assist Technol. 2009 Winter;21(4):218-25; quiz 228.**

### **RESNA position on the application of power wheelchairs for pediatric users.**

Rosen L, Arva J, Furumasu J, Harris M, Lange ML, McCarthy E, Kermoian R, Pinkerton H, Plummer T, Roos J, Sabet A, Vander Schaaf P, Wonsettler T.

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This document, approved by the Rehabilitation Engineering & Assistive Technology Society of North America (RESNA) Board of Directors in March 2007, shares typical clinical applications and provides evidence from the literature supporting the use of power wheelchairs for children.

PMID: 20066888 [PubMed - indexed for MEDLINE]

## **13. Assist Technol. 2009 Winter;21(4):173-87.**

### **Design of an iconic communication aid for individuals in India with speech and motion impairments.**

Bhattacharya S, Basu A.

Department of Computer Science and Engineering, Indian Institute of Technology Guwahati, Assam, India. samit3k@gmail.com

India is home to a large number of individuals with significant speech and motion impairments. Many of these individuals are children and neo-literates who have little proficiency in their language of communication. In order to cater to such individuals in India, we have developed Sanyog, an icon-based communication aid. Sanyog accepts a sequence of icons as input and converts the input sequence to a grammatically correct sentence. Conversion of an iconic sequence to a sentence requires linguistic knowledge and resources that are not available for Bengali and Hindi, the two Indian languages for which Sanyog was developed. To overcome this problem, we have developed a novel user-computer interaction model. The interaction is facilitated by a suitably designed interface. The interaction model and the interface designed for Sanyog are presented in this article.

PMID: 20066884 [PubMed - indexed for MEDLINE]

## 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.*

### 14. J Perinatol. 2010 Feb 25. [Epub ahead of print]

#### **Quantitative analysis of magnetic resonance images and neurological outcome in encephalopathic neonates treated with whole-body hypothermia.**

Massaro AN, Kadom N, Chang T, Glass P, Nelson K, Baumgart S.

Department of Neonatology, Children's National Medical Center, Washington, DC, USA.

**Objective:** To evaluate whether quantitative measures from magnetic resonance imaging (MRI) performed in hypothermia-treated encephalopathic newborns can differentiate patients with unfavorable neurological outcome. **Study Design:** Retrospective analysis of clinical data and MRI studies was performed in 47 full-term infants treated with whole-body hypothermia for neonatal encephalopathy. Apparent diffusion coefficients (ADCs) and T1 and T2 intensity ratios were measured in the basal ganglia and thalamus on axial MRI images. Unfavorable outcome was defined as (1) death or severe neurological deficits at discharge and (2) death or cerebral palsy/severe motor deficit at follow-up through age 9 months. Differences between groups with favorable versus unfavorable neurological outcome at each time point were compared. Optimal cutoff values for significant MR variables were determined with receiver operating curve analyses. Sensitivity and specificity of these cutoff values for predicting unfavorable outcome were calculated and results were compared with qualitative MRI interpretation. **Result:** Infants presented with a median pH of 6.86, base deficit of 20 and Apgar scores of 1, 3 and 4 at 1, 5 and 10 min, respectively. Severe encephalopathy was present in 38%. Unfavorable outcome was present in 9 patients at discharge and in 13 of 26 patients with available follow-up data through 9 months. ADC values and T1 ratios were not significantly different between groups at either time point. T2 ratios in both the basal ganglia and thalamus were significantly higher in patients with unfavorable outcome, both at discharge and in follow-up. T2 intensity ratio in the basal ganglia and thalamus remained significantly associated with death or severe neurological deficit at discharge, after controlling for covariates in logistic regression analysis. Sensitivity and specificity of T2 intensity ratio for predicting unfavorable outcome at discharge were comparable to qualitative grading of injury in the basal ganglia and thalamus by a neuroradiologist. **Conclusion:** Increased T2 signal intensity in the basal ganglia or thalamus in patients with hypothermia-treated neonatal encephalopathy is associated with unfavorable neurological outcome at discharge and later with motor deficit/cerebral palsy. Quantitative methods to assess MRI evidence of brain injury are important for providing objective measures to predict outcome in this high-risk population. *Journal of Perinatology* advance online publication, 25 February 2010; doi:10.1038/jp.2010.7.

PMID: 20182435 [PubMed - as supplied by publisher]

### 15. J Immunol. 2010 Feb 24. [Epub ahead of print]

#### **IL-1 Receptor Antagonist Protects against Placental and Neurodevelopmental Defects Induced by Maternal Inflammation.**

Girard S, Tremblay L, Lepage M, Sébire G.

Laboratoire de Neurologie Pédiatrique, Département de Pédiatrie.

The precise role of maternal bacterial infection and inflammation occurring at the end of gestation is a controversial matter. Although it is recognized as an independent risk factor for neurodevelopmental diseases such as cerebral palsy, mental deficiency, and autism, it remains unclear whether it is causal or simply associated with the diseases. In this study, we demonstrate that IL-1 plays a key role in mediating severe placental damage and neurodevelopmental anomalies in offspring. Our results show that end of gestation exposure of pregnant rats to systemic microbial product (LPS) triggers placental inflammation and massive cell death, fetal mortality, and both forebrain white matter and motor behavioral alterations in the offspring. All these effects are alleviated by the coadministration of IL-1 receptor antagonist with LPS, suggesting a possible protective treatment against human placental and fetal

brain damage.

PMID: 20181892 [PubMed - as supplied by publisher]

#### **16. Curr Opin Obstet Gynecol. 2010 Feb 22. [Epub ahead of print]**

##### **Intrapartum magnesium for prevention of cerebral palsy: continuing controversy?**

Cahill AG, Stout MJ, Caughey AB.

aDepartment of Obstetrics and Gynecology, Washington University in St Louis, St Louis, Missouri, USA bDepartment of Obstetrics, Gynecology and Reproductive Sciences, University of California, San Francisco, California, USA.

**PURPOSE OF REVIEW:** The purpose of the present review is to review the literature regarding the use of antenatal magnesium sulfate (MgSO<sub>4</sub>) for fetal neuroprotection and prevention of cerebral palsy in women at risk of preterm delivery. **RECENT FINDINGS:** Cerebral palsy is a nonprogressive disorder of movement and posture and a leading cause of childhood disability. Preterm birth is a major risk factor for the development of cerebral palsy; gestational age at delivery has an inverse relationship to the risk of cerebral palsy. Observational studies over the past 15 years have suggested a possible protective role for MgSO<sub>4</sub>. In some studies, children born preterm who were exposed prenatally to MgSO<sub>4</sub> for obstetric indications such as seizure prophylaxis or tocolysis had decreased rates of cerebral palsy as compared with children born preterm to women who were not exposed to MgSO<sub>4</sub>. Randomized trials have been conducted to test the hypothesis that maternal MgSO<sub>4</sub> exposure had neonatal neuroprotective effects. These studies included women thought to be at risk of preterm delivery within 24 h. The largest of these studies, published in 2008 by Dr Rouse et al., included more than 2000 women and found a decreased rate of moderate-to-severe cerebral palsy in surviving children born to women treated with MgSO<sub>4</sub>. **SUMMARY:** MgSO<sub>4</sub> treatment in women at high risk for preterm birth may reduce the risk of cerebral palsy in children who survive.

PMID: 20179596 [PubMed - as supplied by publisher]

#### **17. Virol J. 2010 Feb 22;7(1):47. [Epub ahead of print]**

##### **The cross-reactivity of the enterovirus 71 to human brain tissue and identification of the cross-reactivity related fragments.**

Jia CS, Liu JN, Li WB, Ma CM, Lin SZ, Hao Y, Gao XZ, Liu XL, Xu YF, Zhang LF, Qin C.

**BACKGROUND:** EV71 occasionally cause a series of severe neurological symptoms, including aseptic meningitis, encephalitis, and poliomyelitis-like paralysis. However, the neurological destruction mechanism was remained to be clarified. This study described the cross reaction between EV71 induced IgG and human brain tissue. **RESULTS:** Cross reaction of the IgG from 30 EV71 infected patients' sera to human tissues of cerebra was observed, which suggested that some EV71 antigens could induce IgG cross-reactivity to human cerebra. To identify the regions of EV71 virus that containing above antigens, the polypeptide of virus was divided into 19 peptides by expression in prokaryotes cell. Mouse anti-sera of these peptides was prepared and applied in immunohistochemical staining with human adult and fetus brain tissue, respectively. The result indicated the 19 peptides can be classified into three groups: strong cross-reactivity, weak cross-reactivity and no cross-reactivity with human brain tissue according the cross reaction activity. Then, the increased Blood Brain Barrier (BBB) permeability and permits IgG entry in neonatal mice after EV71 infection was determined. **CONCLUSION:** EV71 induced IgG could enter BBB and cross-reacted with brain tissue in EV71 infected neonatal mice, and then the peptides of EV71 that could induce cross-reactivity with brain tissue were identified, which should be avoided in future vaccine designing.

PMID: 20170551 [PubMed - as supplied by publisher]

**18. Early Hum Dev. 2010 Feb 19. [Epub ahead of print]****Bilateral loss of cortical somatosensory evoked potential at birth predicts cerebral palsy in term and near-term newborns.**

Suppiej A, Cappellari A, Franzoi M, Traverso A, Ermani M, Zanardo V.

Child Neurology and Clinical Neurophysiology Unit, Department of Paediatrics, University of Padova, Italy.

Bilateral loss of cortical somatosensory evoked potential (SEP) is considered the single best indicator of adverse outcome in acute encephalopathy of adult patients and older children. This study determines whether the presence or absence of the neonatal cortical SEP can predict cerebral palsy at two years in survivors of neonatal encephalopathy scored according to Sarnat criteria. We also compare SEPs with visual evoked potentials (VEPs), the EEG and neonatal neurological status. Fifty-nine neonates admitted to the neonatal intensive care unit had SEP, VEP and EEG recordings analysed according to the presence (n=37, 63%) or absence (n=22, 37%) of neonatal encephalopathy (score  $\geq 1$ ). Cortical SEP was always present in the perinatal period in those surviving without major neurological disability, while it was bilaterally absent in all but one patient with a subsequent diagnosis of cerebral palsy. Multivariate analysis using the logistic regression model showed that bilateral loss of cortical SEP and Sarnat Score correctly classified the neurological outcome in all patients. Bilateral absence of cortical SEP indicates early identification of neonates at risk of cerebral palsy indicating that EPs have a clinical role in the workup of neonatal encephalopathy. Copyright © 2010 Elsevier Ltd. All rights reserved.

PMID: 20172665 [PubMed - as supplied by publisher]

**19. Nature. 2010 Jan 14;463(7278):154-6.****Neuroscience: the most vulnerable brains.**

Hayden EC.

PMID: 20075895 [PubMed - indexed for MEDLINE]