

Monday 6 September 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. *Dev Med Child Neurol.* 2010 Aug 31. [Epub ahead of print]

#### **Oromotor dysfunction and communication impairments in children with cerebral palsy: a register study.**

Parkes J, Hill N, Platt MJ, Donnelly C.

School of Nursing and Midwifery, Queen's University of Belfast, UK.

**Aim:** To report the prevalence, clinical associations, and trends over time of oromotor dysfunction and communication impairments in children with cerebral palsy (CP). **Method:** Multiple sources of ascertainment were used and children followed up with a standardized assessment including motor speech problems, swallowing/chewing difficulties, excessive drooling, and communication impairments at age 5 years. **Results:** A total of 1357 children born between 1980 and 2001 were studied (781 males, 576 females; median age 5y 11mo, interquartile range 3-9y; unilateral spastic CP, n=447; bilateral spastic CP, n=496; other, n=112; Gross Motor Function Classification System [GMFCS] level: I, 181; II, 563; III, 123; IV, 82; V, 276). Of those with 'early-onset' CP (n=1268), 36% had motor speech problems, 21% had swallowing/chewing difficulties, 22% had excessive drooling, and 42% had communication impairments (excluding articulation defects). All impairments were significantly related to poorer gross motor function and intellectual impairment. In addition, motor speech problems were related to clinical subtype; swallowing/chewing problems and communication impairments to early mortality; and communication impairments to the presence of seizures. Of those with CP in GMFCS levels IV to V, a significant proportion showed a decline in the rate of motor speech impairment ( $p=0.008$ ) and excessive drooling ( $p=0.009$ ) over time. **Interpretation:** These impairments are common in children with CP and are associated with poorer gross motor function and intellectual impairment.

PMID: 20813020 [PubMed - as supplied by publisher]

### 2. *Dev Med Child Neurol.* 2010 Aug 31. [Epub ahead of print]

#### **The effectiveness of task-oriented intervention and trunk restraint on upper limb movement quality in children with cerebral palsy.**

Schneiberg S, McKinley PA, Sveistrup H, Gisel E, Mayo NE, Levin MF.

Centre for Interdisciplinary Research in Rehabilitation (CRIR), Montreal, Canada.

**Aim:** The goal of this study was to contribute evidence towards the effectiveness of task-oriented training with and without restriction of trunk movement (trunk restraint) on the quality of upper limb movement in children with cerebral palsy (CP). **Method:** We used a prospective, single-subject research design in 12 children (three males, nine females; aged 6-11y; median 9y) with di-, hemi-, or quadriplegia. Movements of the most affected arm were assessed five times: three times before training, immediately after training, and 3 months after training. The main

outcome measures were the Melbourne Assessment of Unilateral Upper Limb Function (Melbourne) and upper limb movement kinematics during a functional reaching task. Children were randomly allocated to one of two groups: task-oriented training with or without trunk restraint. Treatment consisted of three 1-hour sessions per week for 5 weeks (total training duration 15h). Treatment effects were determined using single-subject research design analysis - regression through baseline data and standard mean differences. Result: Although the Melbourne scores were largely unchanged after training, some children in each group improved arm trajectory smoothness (effect size 0.55-1.87), and most children improved elbow extension range (effect size 0.55-4.79). However, more children in the trunk restraint group than in the no restraint group demonstrated reduced trunk displacement (effect size 0.94-2.25) and longer-term improvements in elbow extension and trunk use. Among the group who underwent training without trunk restraint, trunk displacement was unchanged or increased, and fewer carry-over effects were apparent at follow-up. Interpretation: This proof-of-principle study showed that greater improvement in the quality of upper limb movement in children with CP, including less compensatory trunk use and better carry-over effects, was achieved by training with trunk restraint.

PMID: 20813019 [PubMed - as supplied by publisher]

### **3. Disabil Rehabil. 2010 Aug 31. [Epub ahead of print]**

#### **Self-concept of adults with cerebral palsy.**

Gannotti ME, Minter CL, Chambers HG, Smith PA, Tylkowski C.

Department of Physical Therapy, University of Hartford, West Hartford, 06117 Connecticut, USA.

**Purpose.** To describe the self-concept of adults with cerebral palsy (CP). **Method.** Cross-sectional design included the Tennessee Self-Concept Scale, version 2 (TSCS:2), Functional Independence Measure (FIM), Beck Depression Index II (BDI(R)-II), Craig Hospital Inventory of Environmental Factors (CHIEF), Diener's Satisfaction with Life Scale (SWLS), Gross Motor Functional Classification System (GMFCS) levels and demographic questions. **Results.** One hundred and two people with CP (52 females, mean age = 26) participated. Thirty-eight participants had unreliable answers as indicated by validity scales and were excluded from the analysis. Ten participants had high self-concept; 41 had average self-concept and 13 had low total self-concept. Self-concept had a fair and inverse association with the BDI-II (Pearson's  $r = -0.3$ ,  $p < 0.01$ ) and a moderate and direct association with the SWLS (Pearson's  $r = 0.4$ ,  $p < 0.001$ ). Self-concept was not associated with GMFCS level or FIM score. Family and Personal sub-domain scores were lowest sub-domain scores for people with low self-concept ( $p < 0.01$ ). **Conclusion.** The majority of the participants in this sample had a healthy self-concept; and self-concept was not associated with severity of CP, but with lack of depression and life satisfaction. Results suggest the need for family centred care into adulthood.

PMID: 20804447 [PubMed - as supplied by publisher]

### **4. Cardiol Young. 2010 Sep 2:1-8. [Epub ahead of print]**

#### **Functional outcomes after neonatal open cardiac surgery: comparison of survivors of the Norwood staged procedure and the arterial switch operation.**

Alton GY, Rempel GR, Robertson CM, Newburn-Cook CV, Norris CM.

1 Glenrose Rehabilitation Hospital and Stollery Children's Hospital, Edmonton, Alberta, Canada.

**BACKGROUND:** Improvements in long-term survival of children undergoing the Norwood staged procedure and the arterial switch operation have resulted in the need to prepare these at-risk children for each stage of their developmental trajectory, including school readiness. This study describes and compares functional outcomes following the Norwood staged procedure and arterial switch operations. **METHODS:** This prospective inception cohort study comprised a sample of 73 children (71% boys) who had the Norwood staged procedure ( $n = 28$ ) or the arterial switch operation ( $n = 45$ ) at the age of 6 weeks or younger at the Stollery Children's Hospital, Edmonton, Alberta, between 2002 and 2005. We excluded children who had chromosomal abnormalities or cerebral palsy. When children were 18-24 months of age, parents completed the Adaptive Behavioral Assessment System II. Standard scores for the domains are mean 100, standard deviation (15); skill area scaled scores, 10 (3). Student's t-test with

Bonferonni correction was used to compare groups. **RESULTS:** This population has greater than four times the number of children delayed on the General Adaptive Composite than the normative group. Functional outcomes were similar in the two groups other than those of home living (Norwood: 8.8 (2.8) compared with arterial switch: 11.2 (3.1),  $t = 3.389$ ,  $p = 0.001$ ) and self-care (Norwood: 5.9 (3.5) versus arterial switch: 8.1 (2.6),  $t = 3.140$ ,  $p = 0.002$ ). **Conclusion** These survivors are at increased risk for delayed functional abilities. Self-care, necessary for independence and confidence as children reach school age, was particularly low in the Norwood group. Reasons for low self-care abilities require further study.

PMID: 20810009 [PubMed - as supplied by publisher]

## 5. Arch Phys Med Rehabil. 2010 Sep;91(9):1423-8.

### Development of romantic relationships and sexual activity in young adults with cerebral palsy: a longitudinal study.

Wiegerink DJ, Stam HJ, Gorter JW, Cohen-Kettenis PT, Roebroek ME; Transition Research Group Southwest Netherlands.

Collaborators (14) Donkervoort M, Nieuwenhuijsen C, van Meeteren J, Bergen MP, Buijs HJ, Nieuwstraten W, de Grund A, Terburg M, Celen E, vd Heijden-Maessen H, Voogt T, Arendzen JH, van Wijlen-Hempel MS, Willemsen S.

Department of Rehabilitation Medicine and Physiotherapy, Erasmus MC, University Medical Center, Rotterdam, The Netherlands.

**OBJECTIVES:** To describe the development of romantic relationships and sexual activity of young adults with cerebral palsy (CP), to investigate whether this development is associated with demographic and physical characteristics, and to compare the sexual activity of this group with an age-appropriate Dutch reference population. **DESIGN:** Prospective longitudinal study with 3 biannual assessments. **SETTING:** Eight rehabilitation centers and departments in the southwestern regions of The Netherlands. **PARTICIPANTS:** Young adults (N=103; 61 men, 42 women) with CP without cognitive disabilities (age range at first assessment, 16-20 y; 82% Gross Motor Function Classification System level I or II). **INTERVENTIONS:** Not applicable. **MAIN OUTCOME MEASURES:** Sexual interest, romantic relationships, and sexual activity. **RESULTS:** We observed a significant increase in dating in young adults with CP during the 4-year period; however, the experience in romantic relationships did not increase largely during this period. Young adults with a lower education level began dating later than those with higher levels. Significantly more women were in current romantic relationships than men. During the 4 years, participants' sexual experience increased significantly for all sexual milestones evaluated. Level of gross motor function was associated significantly with intercourse experience. Compared with an age-appropriate Dutch reference population, young adults with CP participated at a lower level in romantic relationships and sexual activities, but had equal sexual interest at the final assessment. **CONCLUSIONS:** Young ambulatory adults with CP had similar sexual interests and had increasing experiences with romantic relationships and sexual activities during the transition from late adolescence to young adulthood. However, the percentage of young adults with CP in current romantic relationships was low, especially for men.

PMID: 20801262 [PubMed - in process]

## 6. Disabil Rehabil Assist Technol. 2010 Sep 1. [Epub ahead of print]

### The use of pressure mapping for seating posture characterisation in children with cerebral palsy.

Fradet L, Tiernan J, McGrath M, Murray E, Braatz F, Wolf SI.

Department of Orthopaedics, University of Heidelberg, Schlierbacher Landstrasse 200a, Heidelberg, Germany.

**Purpose.** To investigate the feasibility of using pressure mapping for the characterisation of the seated posture of children with cerebral palsy (CP). **Method.** Analysis of pressure mapping readings and video of children seated in a seating system during two assessments: The first assessment involved the pressure mapping of non-disabled children during a standardised protocol, and the second one involved the pressure mapping of children with CP per-

forming daily life activities. Results. It was possible to detect periods of activity of the children from pressure readings using the mean variation of pressure. Additionally, several parameters stemming from pressure readings were shown to be successful in assessing the posture of the children. The centre of pressure when positioned relative to the ischial tuberosities, allowed for recognition of 'adverse postures' involving pelvic obliquity/medio-lateral trunk flexion or antero-posterior pelvic tilt/trunk flexion-extension, as deviations from the centre point. The angle between the principal axis of the sensors' pressure and the medio-lateral axis of the seat was also proposed to characterise pelvic transverse rotation but could not be tested with the actual protocol. Conclusions. Pressure monitoring can be used to assess qualitatively and quantitatively sitting posture of children with CP.

PMID: 20807183 [PubMed - as supplied by publisher]

## 7. J Altern Complement Med. 2010 Sep 1. [Epub ahead of print]

### **The Effects of a 5-Week Therapeutic Horseback Riding Program on Gross Motor Function in a Child with Cerebral Palsy: A Case Study.**

Drnach M, O'Brien PA, Kreger A.

Physical Therapy Department, Wheeling Jesuit University, Wheeling, WV.

**Purpose:** The purpose of this study was to determine the outcome of a short-term therapeutic horseback riding intervention on the gross motor function in a child with cerebral palsy. **Design:** This study employed a repeated-measures design with a pretest, a post-test, and a post post-test conducted 5 weeks apart using the Gross Motor Function Measure (GMFM) as an outcome measure. The three sets of test scores from the GMFM were compared upon completion of the intervention. **Intervention:** The subject participated in a 5-week therapeutic horseback riding program consisting of 1 hour of riding per week. Each riding session consisted of stretching, strengthening, and balance activities. The child's level of motor function was tested prior to the intervention, upon completion of the intervention, and 5 weeks postintervention. The GMFM, a criterion-referenced observational measure designed to measure change in the gross motor function in children with cerebral palsy, was chosen as the assessment tool. **Results:** Upon completion of the 5-week intervention, the child was observed to have improved scores on the GMFM in two of the five dimensions measured and scored for a total of eight items. The post post-test was completed 5 weeks after the final riding session and the results demonstrated successful maintenance of the improved scores in seven of eight items. **Conclusions:** The result of this case study suggest that 5 weeks of therapeutic riding are sufficient to produce positive changes in the gross motor function of a child with cerebral palsy.

PMID: 20809809 [PubMed - as supplied by publisher]

## 8. Chang Gung Med J. 2010 Jul-Aug;33(4):415-23.

### **Factors associated with motor speech control in children with spastic cerebral palsy.**

Chen CL, Lin KC, Chen CH, Chen CC, Liu WY, Chung CY, Chen CY, Wu CY.

Department of Physical Medicine and Rehabilitation, Chang Gung Memorial Hospital at Linkou, Chang Gung University College of Medicine, Taoyuan, Taiwan; Graduate Institute of Early Intervention, Department of Physical Therapy, College of Medicine, Chang Gung University, Taoyuan, Taiwan.

**Background:** Speech production is often impaired in children with cerebral palsy (CP). This study investigated the factors associated with motor speech control in children with spastic cerebral palsy. **Methods:** Thirty-three children with spastic CP who were able to speak were identified for this study. They were classified into two groups: group A (spastic diplegia or hemiplegia, n = 17) and group B (spastic quadriplegia, n = 16). Each child received various assessments, namely cognition, language, modified Verbal Motor Production Assessment for Children (VMPAC), speech intelligibility, CP subtype, and Gross Motor Function Classification System (GMFCS). **Results:** Group A showed better cognition and language function, higher modified VMPAC scores and better GMFCS levels than group B ( $p < 0.05$ ). However, the two groups did not significantly differ in speech intelligibility. Linear regression indicated that all modified VMPAC scores were negatively related to CP subtype (adjusted  $r^2 = 0.51\sim 0.63$ ,  $p < 0.001$ ). The average modified VMPAC scores had a positive relationship with global language scores (adjusted  $r^2 = 0.63$ ,  $p < 0.001$ ), and the modified VMPAC scores of the sequence subtests were positively related to the full intelli-

gence quotients (adjusted  $r^2 = 0.55$ ,  $p < 0.001$ ). Conclusion: The findings of this study suggest that motor impairment severity, cognition and language functions are associated with the motor speech control among children with CP.

PMID: 20804671 [PubMed - in process]

### 9. Indian J Pediatr. 2010 Sep 3. [Epub ahead of print]

#### Neurodevelopmental and Behavioral Outcome of Very Low Birth Weight Babies at Corrected Age of 2 Years.

Mukhopadhyay K, Malhi P, Mahajan R, Narang A.

Department of Pediatrics, PGIMER, Chandigarh, 160012, India, kanyapupul@yahoo.com.

OBJECTIVE: Neurodevelopmental and behavioral assessment of very low birth weight babies (VLBW) at corrected age (CA) of 2 years.

METHODS: 127, 110, 99 and 101 babies  $\leq 34$  weeks and  $\leq 1500$  g were followed at CA of 3, 6, 9, 12 months respectively for developmental and neurological assessment. DASII (Developmental assessment scale for Indian infants) was used at CA of 18 months and preschool behavioural checklist (PBCL) at CA 2 years. RESULTS: Of 101 VLBW babies available for follow up at CA 1 year, 3 (3%) babies had Cerebral Palsy (CP) and 3% ( $n = 3$ ) had suspect abnormality (mild hypotonia), 11% ( $n = 11$ ) had gross motor and 8% ( $n = 8$ ) had language abnormality. Their mean mental (MeDQ) and motor (MoDQ) quotients were  $80.4 \pm 10.7$  and  $77.2 \pm 13.3$  and a score of  $< 70$  was found in 17% (MeDQ) and 25.7% (MoDQ) VLBW babies. High PBCL score (mean  $16.8 \pm 5.4$ ) was seen in 84% VLBW babies. On subgroup analysis, 2 babies (5%) in subgroup 1 ( $n = 54$ ,  $\leq 1200$  g,) and 1 (1.6%) in subgroup 2 ( $n = 78$ , 1201-1500 g) had CP. Twelve (29%) in subgroup 1 had significant language delay ( $p = 0.004$ ) as compared to 4 (15%) in subgroup 2 at 1 year. BSID and PBCL scores were comparable. Amongst ELBW babies ( $< 1000$  g), 6.6% ( $n = 1$ ) had CP, 25% ( $n = 3$ ) and 42% ( $n = 5$ ) had low MeDQ and MoDQ respectively and all of them had high PBCL score. AGA and SGA had similar outcome. CONCLUSION: VLBW babies need close and longer follow up due to high risk of neurodevelopmental and behavioral abnormality.

PMID: 20814839 [PubMed - as supplied by publisher]

### 10. JAMA. 2010 Sep 1;304(9):1028.

#### JAMA patient page. Cerebral palsy.

Torpy JM, Lynm C, Glass RM.

PMID: 20810383 [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.*

### 11. J Matern Fetal Neonatal Med. 2010 Sep 1. [Epub ahead of print]

#### **Congenital cytomegalovirus infection: treatment, sequelae and follow-up.**

Lombardi G, Garofoli F, Stronati M.

Neonatology and Neonatal Intensive Care Unit, Fondazione IRCCS Policlinico San Matteo, Pavia, Italy.

Cytomegalovirus (CMV) is the most common cause of congenital infection affecting about 1% of all the live births worldwide. Its prevalence in the developed world seems to be slightly lower, ranging between 0.6 and 0.7%. Symptoms can be detected at birth in 10-15% of the congenitally infected of which 50-90% will develop sequelae, the most frequent being sensorineural hearing loss (SNHL), visual defect, psychomotor impairment, mental retardation, cerebral palsy and seizures. Eighty-five to 90% of the infected newborns are asymptomatic but 10-15% of them are equally at risk for sensorineural sequelae, like 20-30% of all the infected children. Therefore it is important a time prolonged and closer follow-up of infected children that we propose should be until 6 years of age. This should lead to an early intervention, better management and eventually even control the long-term sequelae. Infants born with symptomatic congenital infection have a worse prognosis than those with no evidence of clinical disease, and ganciclovir (GCV) intravenous 6 mg/kg every 12 h for 6 weeks is the most used therapy for symptomatic newborns. Valganciclovir (V-GCV) syrup is a pro-drug of GCV and presents high oral bioavailability. To date, it is possible to administer this drug at home, and the tolerability profile may allow for wider indications and longer treatments.

PMID: 20807160 [PubMed - as supplied by publisher]

### 12. J Neurosurg Pediatr. 2010 Sep;6(3):206-21.

#### **Postnatal erythropoietin treatment mitigates neural cell loss after systemic prenatal hypoxic-ischemic injury.**

Mazur M, Miller RH, Robinson S.

**Objective:** Brain injury from preterm birth predisposes children to cerebral palsy, epilepsy, cognitive delay, and behavioral abnormalities. The CNS injury often begins before the early birth, which hinders diagnosis and concurrent treatment. Safe, effective postnatal interventions are urgently needed to minimize these chronic neurological deficits. Erythropoietin (EPO) is a pleiotropic neuroprotective cytokine, but the biological basis of its efficacy in the damaged developing brain remains unclear. Coordinated expression of EPO ligand and receptor expression occurs during CNS development to promote neural cell survival. The authors propose that prenatal third trimester global hypoxia-ischemia disrupts the developmentally regulated expression of neural cell EPO signaling, and predisposes neural cells to death. Furthermore, the authors suggest that neonatal exogenous recombinant human EPO (rhEPO) administration can restore the mismatch of EPO ligand and receptor levels, and enhance neural cell survival. **Methods** Transient systemic hypoxia-ischemia (TSHI) on embryonic Day 18 in rats mimics human early-thirdtrimester placental insufficiency. This model was used to test the authors' hypothesis using a novel clinically relevant paradigm of prenatal injury on embryonic Day 18, neonatal systemic rhEPO administration initiated 4 days after injury on postnatal Day 1, and histological, biochemical, and functional analyses in neonatal, juvenile, and adult rats. **Results** The results showed that prenatal TSHI upregulates brain EPO receptors, but not EPO ligand. Sustained EPO receptor upregulation was pronounced on oligodendroglial lineage cells and neurons, neural cell populations particularly prone to loss from CNS injury due to preterm birth. Postnatal rhEPO administration after prenatal TSHI minimized histological damage and rescued oligodendrocytes and gamma-aminobutyric acidergic interneurons. Myelin basic protein expression in adult rats after insult was reduced compared with sham controls, but could be restored to near normal levels by neonatal rhEPO treatment. Erythropoietin-treated TSHI rats performed significantly better than their saline-treated peers as adults in motor skills tests, and showed significant seizure threshold restoration using a pentylenetetrazole increasing-dose paradigm. **Conclusions** These data demonstrate that neona-

tal rhEPO administration in a novel clinically relevant paradigm initiated 4 days after a global prenatal hypoxic-ischemic insult in rats rescues neural cells, and induces lasting histological and functional improvement in adult rats.

PMID: 20809703 [PubMed - in process]

### 13. JAMA. 2010 Sep 1;304(9):976-82.

#### Cerebral palsy among term and postterm births.

Moster D, Wilcox AJ, Vollset SE, Markestad T, Lie RT.

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**CONTEXT:** Although preterm delivery is a well-established risk factor for cerebral palsy (CP), preterm deliveries contribute only a minority of affected infants. There is little information on the relation of CP risk to gestational age in the term range, where most CP occurs. **OBJECTIVE:** To determine whether timing of birth in the term and post-term period is associated with risk of CP.

**DESIGN, SETTING, AND PARTICIPANTS:** Population-based follow-up study using the Medical Birth Registry of Norway to identify 1,682,441 singleton children born in the years 1967-2001 with a gestational age of 37 through 44 weeks and no congenital anomalies. The cohort was followed up through 2005 by linkage to other national registries. **MAIN OUTCOME MEASURES:** Absolute and relative risk of CP for children surviving to at least 4 years of age. **RESULTS:** Of the cohort of term and postterm children, 1938 were registered with CP in the National Insurance Scheme. Infants born at 40 weeks had the lowest risk of CP, with a prevalence of 0.99/1000 (95% confidence interval [CI], 0.90-1.08). Risk for CP was higher with earlier or later delivery, with a prevalence at 37 weeks of 1.91/1000 (95% CI, 1.58-2.25) and a relative risk (RR) of 1.9 (95% CI, 1.6-2.4), a prevalence at 38 weeks of 1.25/1000 (95% CI, 1.07-1.42) and an RR of 1.3 (95% CI, 1.1-1.6), a prevalence at 42 weeks of 1.36/1000 (95% CI, 1.19-1.53) and an RR of 1.4 (95% CI, 1.2-1.6), and a prevalence after 42 weeks of 1.44 (95% CI, 1.15-1.72) and an RR of 1.4 (95% CI, 1.1-1.8). These associations were even stronger in a subset with gestational age based on ultrasound measurements: at 37 weeks the prevalence was 1.17/1000 (95% CI, 0.30-2.04) and the relative risk was 3.7 (95% CI, 1.5-9.1). At 42 weeks the prevalence was 0.85/1000 (95% CI, 0.33-1.38) and the relative risk was 2.4 (95% CI, 1.1-5.3). Adjustment for infant sex, maternal age, and various socioeconomic measures had little effect. **CONCLUSION:** Compared with delivery at 40 weeks' gestation, delivery at 37 or 38 weeks or at 42 weeks or later was associated with an increased risk of CP.

PMID: 20810375 [PubMed - indexed for MEDLINE]

### 14. Am J Epidemiol. 2010 Aug 31. [Epub ahead of print]

#### Early Blood Gas Abnormalities and the Preterm Brain.

Leviton A, Allred E, Kuban KC, Dammann O, O'Shea TM, Hirtz D, Schreiber MD, Paneth N; for the ELGAN Study Investigators.

The authors explored associations between blood gas abnormalities in more than 1,000 preterm infants during the first postnatal days and indicators of neonatal brain damage. During 2002-2004, women delivering infants before 28 weeks' gestation at one of 14 participating institutions in 5 US states were asked to enroll in the study. The authors compared infants with blood gas values in the highest or lowest quintile for gestational age and postnatal day (extreme value) on at least 1 of the first 3 postnatal days with the remainder of the subjects, with separate analyses for blood gas abnormalities on multiple days and for partial pressure of oxygen in the alveolar gas of <35. Outcomes analyzed were ventriculomegaly and an echolucent lesion on an ultrasound scan in the neonatal intensive care unit, and cerebral palsy, microcephaly, and a low score on a Bayley Scale of Infant Development at 24 months. Every blood gas derangement (hypoxemia, hyperoxemia, hypocapnia, hypercapnia, and acidosis) was associated with multiple indicators of brain damage. However, for some, the associations were seen with only 1 day of exposure; others were evident with 2 or more days' exposure. Findings suggest that individual blood gas derangements do not increase brain damage risk. Rather, the multiple derangements associated with indicators of brain damage might be indicators of immaturity/vulnerability and illness severity.

PMID: 20807736 [PubMed - as supplied by publisher]

#### 15. Brain Dev. 2010 Aug 26. [Epub ahead of print]

##### **Serial ultrasonographic observation of bilateral thalami in low birth weight infants with periventricular leukomalacia.**

Fukuda S, Yokoi K, Suzuki S, Goto H.

Department of Pediatrics, Johoku Municipal Hospital, Western Medical Center, 2-15 Kaneda, Kita, Nagoya, Aichi 462-0033, Japan.

Periventricular leukomalacia is a major form of neuropathology in preterm infants that is associated with adverse motor and cognitive outcomes. The volume of periventricular white matter and corpus callosum has been reported to be diminished in infants with PVL, and the degree of the volume loss is correlated with the severity of neurological impairment. The thalamic index was calculated from the length, height, width of the thalamus, and thalamic volume was calculated using the formula for an ovoid in 62 low birth weight infants with gestational ages of 24-35 weeks, 51 control infants (cerebral palsy, 1 case), and 11 infants diagnosed with PVL (cerebral palsy, 7 cases) at postnatal days 0-70. The indices of the right thalamus were lower in infants with PVL than in control infants from day 0 to day 70, and there were significant differences on days 21, 28, 35, 42, 49, 56, 63, and 70. The indices of the left thalamus were lower in infants with PVL than in control infants from day 0 to day 70, and there were significant differences on days 21, 28, 35, 42, 49, 56, 63, and 70. The results of the present study suggest that the volume of the thalami is reduced and that thalamic injury is associated with white matter lesions in infants with PVL.

PMID: 20800982 [PubMed - as supplied by publisher]

#### 16. Arch Dis Child Fetal Neonatal Ed. 2010 Jul;95(4):F234-40.

##### **Outcomes of children born very preterm in Europe.**

Milligan DW.

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PMID: 20576663 [PubMed - indexed for MEDLINE]

#### 17. Chang Gung Med J. 2010 Jul-Aug;33(4):407-14.

##### **Comparison of developmental pattern change in preschool children with spastic diplegic and quadriplegic cerebral palsy.**

Chen CL, Chen KH, Lin KC, Wu CY, Chen CY, Wong AM, Chung CY, Liu WY.

Department of Physical Medicine and Rehabilitation, Chang Gung Memorial Hospital at Linkou, Chang Gung University College of Medicine, Taoyuan, Taiwan; Graduate Institute of Early Intervention, Department of Physical Therapy, College of Medicine, Chang Gung University, Taoyuan, Taiwan.

**Background:** This study compares the longitudinal change of developmental patterns in preschool children with spastic diplegic (SD) and spastic quadriplegic (SQ) cerebral palsy (CP). **Methods:** Sixty children with spastic CP, aged 1-5 years (3.2 +/- 1.2 years), were classified into 2 groups: SD (n = 29) and SQ (n = 31). Gross Motor Function Classification System (GMFCS) levels were classified during the initial assessments. Developmental profiles, including development quotients (DQs) of gross motor, fine motor, expressive language, concept comprehension, situation comprehension, self help, personal social and general development, were evaluated on initial and final assessments and an average of one year later. The DQ change index (%) was calculated as 100% x (final DQ - initial DQ)/initial DQ. **Results:** Children with SQ had lower DQs in all developmental functions than those with SD on both assessments (p < 0.01). The DQ distributions of developmental profiles were different in SD and SQ groups,

although both groups displayed the lowest DQs in the gross motor domain. As indicated by the DQ change index, most DQs increased with age in children with SD; however, most decreased with age in children with SQ ( $p < 0.05$ ). Conclusion: These findings suggest different CP subtypes demonstrate various development profiles. The evolution of developmental patterns with age was different in children with various CP subtypes.

PMID: 20804670 [PubMed - in process]

#### 18. Fiziol Zh. 2010;56(3):3-18.

##### Valeology and biophysical medicine [Article in Ukrainian]

[No authors listed]

We analysed the official statistical data about the morbidity in different Ukrainian regions, its copulas over is brought with the ecological features in the environmental contamination of age-old features of development pathologies, which result in the loss of capacity and country's depopulation. Cited data about the medicinally conditioned diseases and by-reactions after drugs introduction. The own material contains the clinical supervisions results after additional application the instrumental oroterapy procedure--the driven gas environment with lowered oxygen partial pressure in co-operating with the traditional treatment for the patients suffering with the child's cerebral paralysis. The positive instrumental oroterapy effects was shown on the motive functions state, electroencephalography dates, about the main brain complex activity from 53 childrens with pulsy. Drawn conclusion about the appropriateness of including the natural or instrumental oroterapy in the children's rehabilitation programs or for physiology regeneration in youth and adults.

PMID: 20799627 [PubMed - in process]