

Monday 15 November 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. Disabil Rehabil. 2010 Nov 10. [Epub ahead of print]

Content comparison of health-related quality of life measures for cerebral palsy based on the International Classification of Functioning.

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Purpose. Content comparison of health-related quality of life (HRQOL) measures is currently important because of the varying use of concepts and operationalisations. Our objective was to use the International Classification of Functioning Children and Youth version (ICF-CY) as a standard by which to compare the content of all cerebral palsy (CP) disease-specific HRQOL measures. **Methods.** MEDLINE and PsycINFO databases were searched up to September 2008. The content of HRQOL measures was linked to the ICF-CY by two trained assessors. Agreement was calculated using kappa (κ) statistic. **Results.** Four disease-specific HRQOL measures were identified. Three generic measures were selected as a content comparison group. A total of 576 concepts contained in the measures were identified. Eighty-nine percent ($n = 510$) were linked to 127 different ICF-CY categories. Overall κ agreement was 0.76 (95% CI: 0.75-0.77). Forty percent of concepts were linked to the activity and participation component. The measures varied in the number of concepts and the distribution of concepts by ICF-CY components. **Conclusions.** The ICF-CY provided an international accepted, structured framework for the content comparison of CP-specific and generic HRQOL measures. The results will provide clinicians and researchers with additional information, useful when selecting HRQOL measures.

PMID: 21067341 [PubMed - as supplied by publisher]

2. BMC Pediatr. 2010 Nov 9;10(1):81. [Epub ahead of print]

A systematic review of the psychometric properties of Quality of Life measures for school aged children with cerebral palsy.

Carlton S, Shields N, Yong K, Gilmore R, Sakzewski L, Boyd R.

BACKGROUND: This systematic review aimed to evaluate the psychometric properties and clinical utility of all condition specific outcome measures used to assess quality of life (QOL) in school aged children with cerebral palsy (CP). **METHODS:** Relevant outcome measures were identified by searching 8 electronic databases, supplemented by citation tracking. Two independent reviewers completed data extraction and analysis of the measures using a modified version of the CanChild Outcome Measures Rating Form. **RESULTS:** From the 776 papers identified 5 outcome measures met the inclusion criteria: the Care and Comfort Hypertonicity Questionnaire (C&CHQ), the Caregiver Priorities and Child Health Index of Life with Disabilities (CPCHILD), CP QOL-Child, DISABKIDS and PedsQL 3.0 CP Module. There was evidence of construct validity for all five measures. Content validity was

reported for all measures except PedsQL 3.0. The CPCHILD and CP QOL-Child were the only outcome measures to have reported data on concurrent validity. All measures, with the exception of one (C&CHQ) provided evidence of internal reliability. The CPCHILD and the CP-QOL-Child had evidence of test-retest reliability and DISABKIDS had evidence of inter-rater reliability. There were no published data on the responsiveness of these outcome measures. **CONCLUSIONS:** The CPCHILD and the CP QOL-Child demonstrated the strongest psychometric properties and clinical utility. Further work is needed, for all measures, on data for sensitivity to change.

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3. BMC Pediatr. 2010 Nov 8;10(1):80. [Epub ahead of print]

LEARN 2 MOVE 2-3: a randomized controlled trial on the efficacy of child-focused intervention and context-focused intervention in preschool children with cerebral palsy.

Ketelaar M, Kruijssen AJ, Verschuren O, Jongmans MJ, Gorter JW, Verheijden J, Reinders-Messelink HA, Lindeman E.

BACKGROUND: Little is known about the efficacy and the working mechanisms of physical and occupational therapy interventions for children with cerebral palsy (CP). In recent years a shift from a child-focused intervention approach to a more context-focused intervention approach can be recognized. Until now the evidence on the efficacy and the working mechanisms of these interventions for children with CP is inconclusive. This study aims to evaluate the efficacy and working mechanisms of two intervention approaches compared to regular care intervention in improving mobility and self-care skills of children (2-3 years) with CP and their families: a child-focused intervention approach and a context-focused intervention approach. **METHODS:** A multi-centre, randomized controlled trial research design will be used. Ninety-four children with CP (Gross Motor Function Classification System (GMFCS) level I-IV; age 2 to 3 years), their parents, and service providers (physical and occupational therapists) will be included. During a period of six months children will receive child-focused, context-focused or regular care intervention. Therapists will be randomly assigned to deliver either a child-focused intervention approach, a context-focused intervention approach or regular care intervention. Children follow their therapist into the allocated intervention arm. After the six months study-intervention period, all participants return to regular care intervention. Outcomes will be evaluated at baseline, after six months and at a three months follow-up period. Primary outcome is the capability of functional skills in self-care and mobility, using the Functional Skills Scale of the Pediatric Evaluation of Disability Inventory (PEDI). Other outcomes will be quality of life and the domains of the International Classification of Functioning, Disability and Health - for Children and Youth (ICF-CY), including body function and structure, activities (gross motor capacity and performance of daily activities), social participation, environmental variables (family functioning, parental empowerment). **DISCUSSION:** This paper presents the background information, design, description of interventions and protocol for this study on the efficacy and working mechanisms of child-focused intervention approach and context-focused intervention approach compared to regular care intervention in mobility and self-care skills of children (2-3 years) with CP. Trial registration This study is registered in the Dutch Trial Register as NTR1900.

PMID: 21059257 [PubMed - as supplied by publisher]Free Article

4. BMC Pediatr. 2010 Nov 5;10(1):79. [Epub ahead of print]

LEARN 2 MOVE 16-24: Effectiveness of an intervention to stimulate physical activity and improve physical fitness of adolescents and young adults with spastic cerebral palsy; a randomized controlled trial.

Slaman J, Roebroek ME, van Meeteren J, van der Slot WM, Reinders-Messelink HA, Lindeman E, Stam HJ, van den Berg-Emons RJ.

BACKGROUND: Persons with cerebral palsy (CP) are at risk for developing an inactive lifestyle and often have poor fitness levels, which may lead to secondary health complications and diminished participation and quality of life. However, persons with CP also tend not to receive structural treatment to improve physical activity and fitness in adolescence, which is precisely the period when adult physical activity patterns are established. **METHODS:** We aim to include 60 adolescents and young adults (16-24 years) with spastic CP. Participants will be randomly assigned to an intervention group or a control group (no treatment; regular situation). The intervention will last 6 months and consist of three parts; 1) counselling on daily physical activity; 2) physical fitness training; and 3) sports

advice. To evaluate the effectiveness of the intervention, all participants will be measured before, during, directly after, and at 6 months following the intervention period. Primary outcome measures will be: 1) physical activity level (measured objectively with an accelerometry-based activity monitor during 72h and subjectively with the Physical Activity Scale for Individuals with Physical Disabilities); 2) aerobic fitness (measured with a maximal ramp test on a bicycle or armcrank ergometer and a 6-minute walking or wheelchair test); 3) neuromuscular fitness (measured with handheld dynamometry); and 4) body composition (body mass, height, waist circumference, fat mass and lipid profile). CONCLUSIONS: This paper outlines the design, methodology and intervention of a multicenter randomized controlled trial (LEARN 2 MOVE 16-24) aimed at examining the effectiveness of an intervention that is intended to increase permanently physical activity levels and improve fitness levels of adolescents and young adults with CP by achieving a behavioral change toward a more active lifestyle. Trial registration: Dutch Trial Register; NTR1785.

PMID: 21054829 [PubMed - as supplied by publisher]

5. Zhongguo Zhen Jiu. 2010 Oct;30(10):826-9.

Clinical observation on infantile cerebral palsy treated with quick meridian needling therapy plus scalp acupuncture [Article in Chinese]

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OBJECTIVE: To assess the efficacy of quick meridian needling therapy plus scalp acupuncture on infantile cerebral palsy (CP). METHODS: One hundred and forty-seven cases of CP were randomly divided into a quick meridian needling therapy plus scalp acupuncture group (group A), a conventional acupuncture group (group B) and a scalp acupuncture group (group C), 49 cases in each one. In group A, quick needling was applied to the Conception Vessel, Governor Vessel, Hand-Yangming, Hand-Jueyin, Foot-Yangming and Foot-Taiyin meridians distributed on four limbs and trunk. One pricking point was 10 mm far from the other one. In scalp acupuncture, motor area, equilibrium area, sensory area, tremor-control area, foot-motor-sensory area, speech No. 2 area, speech No. 3 area, Baihui (GV 20), Sishencong (EX-HN 1), etc. were selected. The needles were stimulated with rotating manipulation and remained for 30-60 min. In group B, the conventional acupuncture was adopted mainly at Dazhui (GV 14), Shenzhu (GV 12), Fengfu (GV 16) and others. In group C, the scalp acupuncture was used and the points selected were same as those in group A for scalp acupuncture treatment. The scores of Gross Motor Function Measure (GMFM) were observed before and after treatment for children. The clinical efficacy of each group was evaluated. By follow-up for 12 months, the condition of independent walking was observed. RESULTS: The total effective rate in group A was 79.6% (39/49), which was superior to that of group B [49.0% (24/49)] and group C [51.0% (25/49)] respectively (both $P < 0.05$). After treatment, GMFM scores of children were all improved significantly in 3 groups ($P < 0.001$, $P < 0.05$), of which, the improvement extent in group A was superior to that of other two groups (both $P < 0.05$). It was found after follow-up for 1 year that 31 cases could walk independently in group A, which was more than group B (17 cases) and group C (16 cases). CONCLUSION: The quick meridian needling therapy plus scalp acupuncture can improve significantly limb motor function of children with cerebral palsy and its therapeutic effect is superior to conventional acupuncture and simple scalp acupuncture.

PMID: 21058480 [PubMed - in process]

6. Pediatr Phys Ther. 2010 Winter;22(4):427-38.

Long-term Physical Therapy Management Following a Single-Event Multiple Level Surgery.

Kondratek M, McCollum H, Garland A.

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PURPOSE: This case report provides an overview of surgical procedures, including single-event multiple level surgery (SEMLS) used in the management of secondary conditions in cerebral palsy (CP). Physical therapy (PT) management over 35 months following SEMLS is described for an adolescent (Gross Motor Function Classification System level II) with CP. SUMMARY OF KEY POINTS: When conservative management is not sufficient to manage

secondary complications, SEMLS, combined with PT and family support, may provide the foundation for greater functional improvement than surgical correction of a single impairment. The outcome measures used following SEMLS included the Gross Motor Function Measure-66, Activity Scale for Kidsperformance³⁸, goniometry, manual muscle testing, and Numerical Pain Rating Scale. STATEMENT OF CONCLUSIONS: Preoperative functional level can be exceeded and sustained beyond 24 months following surgery. RECOMMENDATIONS FOR CLINICAL PRACTICE:: Rehabilitation following a SEMLS requires teamwork and a long-term commitment to maximize outcomes.

PMID: 21068643 [PubMed - in process]

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.

7. Arch Dis Child. 2010 Nov 10. [Epub ahead of print]

Cerebral palsy rates by birth weight, gestation and severity in North of England, 1991-2000 singleton births.

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Objective: To investigate changes in rates of cerebral palsy (CP) by birth weight, gestational age, severity of disability, clinical subtype and maternal age in the North of England, 1991-2000. Methods: Data on 908 cases of CP (816 singletons, 92 multiples) were analysed from the prospective population-based North of England Collaborative Cerebral Palsy Survey. Severity of disability, measured as a Lifestyle Assessment Score (LAS), was derived from the lifestyle assessment questionnaire. CP rates by birth weight, gestational age, birth weight standardised for gestational age and sex, severity of disability and maternal age were compared between 1991-1995 and 1996-2000 using rate ratios (RR). Results: The prevalence of CP in singletons was 2.46 (95% CI 2.29 to 2.63) per 1000 neonatal survivors compared to 11.06 per 1000 (95% CI 8.81 to 13.3) in multiples (RR 4.49, 95% CI 3.62 to 5.57), with no significant change between quinquennia. The singleton CP rates were higher for lower birth weight groups than birth weight ≥ 2500 g; and there were no significant changes for any birth weight group between quinquennia. There were also no changes in rates of more severe disability (LAS $\geq 30\%$) by birth weight, gestation or clinical subtype. For preterm and term births the patterns of Z-score of birth weight-for-gestation are similar, with CP rates increasing as Z-score deviates from the optimal weight-for-gestation, which is about 1 SD above the mean. Conclusions: In contrast to increasing rates in previous years, rates of CP and more severe CP were stable by birth weight, gestational age and clinical subtype for 1991-2000.

PMID: 21068077 [PubMed - as supplied by publisher]

8. Pediatrics. 2010 Nov 8. [Epub ahead of print]

Gestational Age and Basic School Achievements: A National Follow-up Study in Denmark.

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Objective: Children born at <32 weeks' gestation are at increased risk of intellectual impairment. Few studies have focused on the majority of preterm children born at 32 to 36 weeks' gestation. The aim was to investigate the association between the full range of gestational ages at birth and the risk of not completing basic school. Methods: This longitudinal, register-based study included all live-born infants in Denmark from 1988 to 1989. Data were obtained from national registers. School achievements were evaluated by using the examination marks. The association between gestational age and not completing basic school was estimated, taking into account the effect of their par-

ents' educational level, being small for gestational age, plurality, and cerebral palsy. Results: The cohort constituted 120 585 infants, of whom 118 281 (98.6%) were alive in 2007. Of these infants, 5.01% (n = 5.928) were born before 37 weeks' gestation. Of the subjects born before 37 weeks' gestation, 11.5% (95% confidence interval: 10.7-12.4) did not complete basic school compared with 7.5% (95% confidence interval: 7.3-7.6) of those born at term. The percentage of subjects who did not complete basic school increased with decreasing gestational age. The increase was steeper at <31 weeks (4.2% per week) than at 31 to 36 weeks' gestation (0.5% per week). Conclusions: The risk of not completing basic school increased with decreasing gestational age. The risk was moderate at ≥31 weeks' gestation and increased steeply at <31 weeks' gestation. The increase at <31 weeks' gestation was only partly explained by cerebral palsy.

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9. *Pediatr Int.* 2010 Nov 5. doi: 10.1111/j.1442-200X.2010.03287.x. [Epub ahead of print]

Thyroxine for transient hypothyroxinemia and cerebral palsy in extremely preterm infants.

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Background: The relationship of thyroxine supplementation for transient hypothyroxinemia of prematurity to the incidence of cerebral palsy (CP) in infants less than 28 weeks of gestation is unclear. Methods: Incidence of CP at a corrected age of 18 months was compared between infants born in a 3-year period in which routine measurement of blood free T4 (FT4) was not performed (first period, n = 54), and those born in a later 3-year period in which FT4 was measured (second period, n = 60; mainly at 7 days old) and L-thyroxine 5-10 µg/kg/day (mean, 9 µg/kg/day) was administered for FT4 levels <0.8 ng/dl. Incidence of CP at 3 years old was also compared between the same groups. Results: Background clinical factors between the two groups were comparable except for prenatal steroid administration, which was reduced in the second period. Incidence of CP at a corrected age of 18 months was significantly lower in the second period (3.3%) than in the first period (16.6%). Incidence of CP at 3 years old was also significantly lower in the second period. Multiple logistic regression analysis using factors except thyroxine supplementation, for the total of 114 infants from both groups, found no perinatal factors related to the development of CP at a corrected age of 18 months. Conclusions: These results suggest that thyroxine supplementation for transient hypothyroxinemia of prematurity may reduce the incidence of CP in extremely preterm infants. Large-scale randomized controlled trials are essential to determine the effects of thyroxine supplementation in reducing the incidence of CP among extremely preterm infants.

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10. *Thromb Res.* 2010 Nov 3. [Epub ahead of print]

New insights (and new interrogations) in perinatal arterial ischemic stroke.

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With an incidence of 1/2800 to 1/5000 live-births, perinatal arterial ischemic stroke is the most frequent form of cerebral infarction in children. About 40% of the children do not have specific symptoms in the neonatal period, and are only recognized later with the emergence of motor impairment, developmental delay, specific cognitive deficiency or seizures. In the remaining 60%, children present with early symptoms, mostly recurrent focal seizures in the first 3 days of life. The diagnosis is easily confirmed by cranial ultrasounds and MRI. Early MRI has both a key role in the diagnosis, dating the injury, but also an important prognostic value to predict the motor outcome of the child. Indeed, although the infarct does not recur, the majority of children show subsequent sequels: cerebral palsy, epilepsy, cognitive or behavioural problems. Finding predictors of outcome regarding these latter concerns (and the way to prevent or alleviate them) is of major interest. The main etiological hypothesis for perinatal AIS is a cerebral

embolus, originating from the placenta through the foramen ovale. Most of the established risk factors are indeed either determinants or biomarkers of vasculo-placental pathology. Injury to the cervico-cerebral arteries, giving rise to thrombus/embolus during the birthing process is also suggested. Both placento-embolic and traumatic theories are supported by a few, but well-analysed pathological or arteriographic reports. Nevertheless, their relative frequency, the implication of other mechanisms, and their repercussions to evidence-based preventive strategies remain to be determined. Moreover, the mechanism of stroke in the different groups of newborns with stroke (term vs. preterm; symptomatic neonates vs. those with a delayed presentation) is likely to be different, and there is a need for future studies to assess all populations as different entities. Neonatal supportive care remains important for all infants while there is no evidence for preventive anticoagulant use at present. In an effort to reduce neurological dysfunction, and in adjunction with ongoing physical therapy and pharmacological treatment, new rehabilitative interventions, such as constraint-induced movement therapy and mirror therapy, are increasingly being used.

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11. Kinderkrankenschwester. 2010 Sep;29(9):389-92.

What do early childhood movements tell us? [Article in German]

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PMID: 20942313 [PubMed - indexed for MEDLINE]