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CP Research News

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1: J Pediatr Orthop. 2008 Oct-Nov;28(7):773-6.

Nerve palsy after hamstring lengthening in patients with cerebral palsy.

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BACKGROUND: The purpose of this study was to assess the incidence of, risk factors for, and treatment of nerve palsy after hamstring lengthening in children with cerebral palsy. **METHODS:** A medical record review of patients with cerebral palsy who had hamstring lengthening between 1994 and 2005 was performed. Data included the preoperative popliteal angle, the presence of a knee flexion contracture, postoperative pain management, and type of immobilization. The presence of postoperative nerve palsy was established based on the recording of numbness, loss of motor function in the foot, or hypersensitivity of the foot in the inpatient record or the postoperative clinic notes. The need for medical management and time to resolution of symptoms were noted. **RESULTS:** A total of 292 children underwent 329 hamstring lengthening surgeries. The mean age at surgery was 9.5 years (range, 2.5-18 years). Twenty-eight patients (9.6%) experienced postoperative nerve palsy. Time to recognition of the palsy ranged from 4 hours to 72 days. Patients diagnosed within 24 hours had loss of motor function and/or lack of sensation of the toes. Patients diagnosed from 8 to 72 days postoperatively had dysesthesias of the feet. Treatment of early palsies consisted of the removal of immobilization, bivalving of casts, or wedging casts into flexion. Fourteen of 28 patients were treated with Neurontin. Twenty-two of 25 patients with adequate follow-up recovered nerve function. Older children, noncommunicative patients, nonambulatory patients, and those who had epidural pain management were at statistically significant higher risk for postoperative palsy. The trend for palsies in spastic quadriplegic patients and after repeat lengthening procedures did not reach significance. There was no significant relationship between popliteal angle or the presence of a knee flexion contracture and development of nerve palsy. **CONCLUSIONS:** Nerve palsy occurred in 9.6% of patients undergoing hamstring lengthening. Although the greatest risk was in noncommunicative adolescents who were nonambulatory, a small number of younger ambulatory patients developed palsies as well, so that all patients must be considered at risk. Vigilance in patients with epidural pain control to avoid excessive hip flexion and/or knee extension is warranted.



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Treatment is immediate knee flexion. Resolution of symptoms occurred in 82.1% of patients.

PMID: 18812906 [PubMed - in process]

2: Dev Med Child Neurol. 2008 Sep 22. [Epub ahead of print]

A systematic review of the effectiveness of aerobic exercise interventions for children with cerebral palsy: an AACPD evidence report.

Rogers A, Furler BL, Brinks S, Darrah J.

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The aim of this review was to assess the evidence regarding the effectiveness of aerobic training interventions for children with cerebral palsy (CP). The target population included children with CP of any severity, aged 2 to 17 years. The following databases were searched for English language studies from 1960 to 2006: MEDLINE, EMBASE, CINAHL, Pascal, Cochrane Library, CSA Neuroscience Abstracts, The Physiotherapy Evidence Database (PEDro), and Sport Discus. Search terms included 'cerebral palsy', 'athetoid', 'ataxic', 'spastic diplegia', 'hemiplegia', 'quadriplegia', 'aerobic', 'exercise', 'training', 'physical activity', 'aquatic/water/pool therapy', and 'continuous exercise'. The American Academy for Cerebral Palsy and Developmental Medicine systematic review guidelines were used to format the review. One thousand, four hundred and eighty nine articles were identified and examined for the stated inclusion and exclusion criteria. Thirteen articles met the criteria for inclusion. The evidence suggests that aerobic exercise with children with CP can improve physiological outcomes, but the influence of these changes on outcomes representing activity and participation are unknown. Future research needs improved methodological rigour in order to determine a specific set of exercise guidelines and safety considerations.

PMID: 18811714 [PubMed - as supplied by publisher]

3: Dev Med Child Neurol. 2008 Sep 20. [Epub ahead of print]

Quantification of upper extremity function and range of motion in children with cerebral palsy.

Koman LA, Williams RM, Evans PJ, Richardson R, Naughton MJ, Passmore L, Smith BP.

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This study evaluated the hypothesis that upper extremity function and range of motion can be quantified reliably in children with cerebral palsy (CP) in a busy clinical setting. The specific aim was to determine the inter- and intrarater reliability of a modified House Functional Classification (MHC) system to evaluate upper extremity function and a standardized instrument to document upper extremity range of motion (Upper Extremity Rating Scale [UERS]). Sixty-five children with CP (43 males, 22 females, mean age 9y 2mo, SD 4y 1mo) with spasticity involving the upper extremity (quadriplegia n=22; hemiplegia n=36; diplegia n=7; Gross Motor Functional Classification System Levels I n=41, II n=6, III n=3, IV n=5, V n=10) were evaluated independently by occupational therapists and orthopedic surgeons using both instruments at several visits. Inter- and intrarater reliability were determined for both instruments by calculating measures of agreement (weighted kappa values and intraclass correlation coefficients [ICCs]). Interrater agreement (ICC=0.94) and intrarater agreement (ICC=0.96) on the MHC were good to excellent. Similarly, inter-rater agreement (kappa 0.66-0.81) and intrarater agreement (kappa 0.64-0.88) on the UERS was either good or excellent. The MHC and the UERS provide standardized, reliable, reproducible, and efficient instruments that can be used by occupational therapists and orthopedic surgeons to evaluate the upper extremities of children with CP.

PMID: 18811712 [PubMed - as supplied by publisher]

4: Dev Med Child Neurol. 2008 Sep 20. [Epub ahead of print]

Tactile sensory abilities in cerebral palsy: deficits in roughness and object discrimination.

Wingert JR, Burton H, Sinclair RJ, Brunstrom JE, Damiano DL.

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Motor deficits in cerebral palsy (CP) have been well documented; however, associated sensory impairment in CP remains poorly understood. We examined tactile object recognition in the hands using geometric shapes, common objects, and capital letters. Discrimination of tactile roughness was tested using paired horizontal gratings of varied groove widths passively translated across the index finger. We tested 17 individuals with hemiplegia (mean 13y 9mo [SD 5y 2mo]; 6 males, 11 females), 21 with diplegia (mean 14y 10mo [SD 7y]; 10 males, 11 females), and 21 without disabilities (mean 14y 10mo [SD 5y 1mo]; 11 males, 10 females). All participants with CP fell within level I or II of the Gross Motor Function Classification System and level I or II of the Manual Abilities Classification System. Individuals with CP were significantly less accurate compared with those without disabilities on all tactile object-recognition tasks using their non-dominant hand. Both groups of patients also had significantly higher thresholds for groove-width differences with both hands compared with those without disabilities. Within the group with diplegia, only roughness discrimination differed between hands, whereas within the group with hemiplegia, significant between-limb differences were present for all tasks. Despite mild motor deficits compared with the entire population of individuals with CP, this sample demonstrated ubiquitous tactile deficits.

PMID: 18811710 [PubMed - as supplied by publisher]

5: Dev Med Child Neurol. 2008 Sep 20. [Epub ahead of print]

Unravelling the cerebral palsy upper limb.

Hoare B.

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PMID: 18811700 [PubMed - as supplied by publisher]

6: Hum Genet. 2008 Sep 23. [Epub ahead of print]

Association between Apolipoprotein E genotype and cerebral palsy is not confirmed in a Caucasian population.

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Apolipoprotein E (APOE) plays a significant role in lipid metabolism and has been implicated in the growth and repair of injured neurons. Two small studies have suggested an association between APOE genotype and cerebral palsy. We investigated if APOE genotype is associated with an increased risk for cerebral palsy, influences the type of cerebral palsy or interacts with prenatal viral infection to influence risk of cerebral palsy. The population-based case-control study comprised newborn screening cards of 443 Caucasian patients with cerebral palsy and 883 Caucasian matched controls. APOE genotyping was performed on DNA extracted from dried blood spots. Allelic and genotypic frequencies did not differ between cases and controls and combined frequencies were 0.10 (epsilon2), 0.76 (epsilon3), 0.14 (epsilon4), 0.03 (epsilon2/epsilon2), 0.10 (epsilon2/epsilon3), 0.03 (epsilon2/epsilon4), 0.02 (epsilon4/

epsilon4), 0.21 (epsilon3/epsilon4), 0.61 (epsilon3/epsilon3). APOE genotype was correlated with cerebral palsy, type of cerebral palsy, gestation at birth and the presence of viral nucleic acids detected in previous work. Analysis by gestational age (all gestational ages, ≥ 37 , 32-36 and < 32 weeks) and type of cerebral palsy (all types, diplegia, hemiplegia and quadriplegia) showed no association between APOE genotype and cerebral palsy in this Caucasian population. An association between prenatal viral infection, APOE genotype and cerebral palsy was not demonstrated. These results did not confirm an association between APOE genotype, cerebral palsy, type of cerebral palsy and prenatal infection in a Caucasian population. Given the low frequency of APOE epsilon2 and some of the heterozygote and homozygote combinations in this study, a larger study is assessing this further.

PMID: 18810496 [PubMed - as supplied by publisher]

7: Indian J Pediatr. 2008 Sep 22. [Epub ahead of print]

Impact of an educational program on parental knowledge of cerebral palsy.

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OBJECTIVE: To investigate parental knowledge of cerebral palsy, and to evaluate the impact of an educational intervention on it. **METHODS:** From May 2003 to April 2004, 26 parents of newly diagnosed children with cerebral palsy were interviewed. After the interview, each parent was administered a structured educational program and re-interviewed after three months. The pre and post intervention responses were compared using Chi-square test. **RESULTS:** After the intervention, there was a significant improvement in parental knowledge: (i) of the cause of the disorder (5/26 vs 20/26, $P = 0.0001$), (ii) that it is non-progressive (16/26 vs 24/26, $P = 0.021$), (iii) that it is not curable (10/26 vs 23/26, $P = 0.0005$), (iv) that it is treatable (12/26 vs 24/26, $P = 0.0009$), (v) of the frequency and duration of therapy necessary to improve functional abilities (7/26 vs 17/26, $P = 0.005$), and, (vi) of the importance of following up regularly with a pediatrician (17/26 vs 26/26, $P = 0.003$). However, there was no significant improvement in parental knowledge: (i) of the meaning of the term 'cerebral palsy' (0/26 vs 5/26, $P = 0.060$), (ii) that 'early intervention therapy' given by a team of therapists is its recommended therapy (18/26 vs 23/26, $P = 0.174$), (iii) of the meaning of the term 'early intervention therapy' (12/26 vs 17/26, $P = 0.163$), and (iv) that it is preventable with good medical care (8/26 vs 10/26, $P = 0.560$). **CONCLUSION:** Parental knowledge of cerebral palsy is inadequate. A single-session educational program can significantly improve parental knowledge about many 'core basic issues' regarding cerebral palsy.

PMID: 18810366 [PubMed - as supplied by publisher]

8: Neurochirurgie. 2008 Sep 20. [Epub ahead of print]

Transition from childhood to adulthood and management of spasticity. [Article in French]

Roujeau T, Di Rocco F, Zérah M.

Service de neurochirurgie pédiatrique, groupe hospitalier Necker-Enfants-Malades, Assistance-publique-Hôpitaux-de-Paris, université Paris V, 149, rue de Sèvres, 75473 Paris cedex 15, France.

The authors report specific concerns on the transition to adulthood in cerebral palsy patients, with particular attention devoted to spasticity treatment follow-up.

PMID: 18809186 [PubMed - as supplied by publisher]

9: Handb Clin Neurol. 2007;87:591-609.

Neurorehabilitation of children with cerebral palsy.

Maria Barlow K.

Alberta Children's Hospital, Calgary, Alberta, Canada.

PMID: 18809046 [PubMed - in process]

10: Paediatr Nurs. 2008 Sep;20(7):20-3.

Improving care for children with cerebral palsy.

Newey C.

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A report about the health care of people with learning disability published by a UK charity concluded that this group was discriminated against and that healthcare professionals had a poor understanding of their needs. A case report of a young person with cerebral palsy is used here to demonstrate good practice in the care of children with learning disabilities. The careful development over time of individualised solutions makes a difference to the quality of life for children and families. Improved understanding through education as well as collaborative working and family participation will help ensure that children and young people receive the range of services they require.

PMID: 18808052 [PubMed - in process]

11: No To Hattatsu. 2008 Sep;40(5):387-92.

Prevalence of cerebral palsy in Okinawa between 1995 and 2001 [Article in Japanese]

Touyama M, Touyama J.

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We report a population based study of prevalence of cerebral palsy in children born between 1995 and 2001 in Okinawa. The overall prevalence of cerebral palsy was 2.3 per 1,000 live-births; this result was higher than that reported in our previous study conducted between 1988 and 1994. We found a high prevalence of cerebral palsy in children weighing less than 2,500 g, especially in those weighing less than 1,500 g at birth. Moreover we found children weighing more than 1,800 g or those who had more than 33 weeks of gestation period at birth showed a lower risk for cerebral palsy.

Publication Types:
English Abstract

PMID: 18807887 [PubMed - in process]

12: Pediatr Neurol. 2008 Oct;39(4):253-8.

Prospective study examining remote effects of botulinum toxin a in children with cerebral palsy.

Crowner BE, Racette BA.

Program in Physical Therapy, Washington University School of Medicine, St. Louis, Missouri.

We examined the remote effects on muscle strength and functional decline of lower-extremity botulinum toxin A injections in children with cerebral palsy. This prospective study enrolled 34 children (19 boys, 15 girls; mean age, 7.7 years) diagnosed with spastic cerebral palsy. Patients were examined at baseline and 1 month to determine if they experienced a change in upper-extremity strength (handheld dynamometry) or function (Pediatric Outcomes Data Collection Instrument). Subjects were analyzed in aggregate and by dosing group (low dose, 0-10 U/kg body weight; high dose, 11-25 U/kg) to determine if injection dose was associated with a change in remote muscle strength or function. We measured baseline and 1-month postinjection strength in shoulder flexor, shoulder abductor, elbow flexor, elbow extensor, and finger flexor muscles. None of these remote muscle groups was significantly weaker at 1 month after injection. No correlation was evident between change in muscle strength and toxin dose. These findings indicate that doses of botulinum toxin A in the lower extremities, at up to 21 U/kg, do not affect upper-extremity strength. This information can help guide dosages of botulinum toxin A in the management of spasticity in children with cerebral palsy.

PMID: 18805363 [PubMed - in process]

13: Lancet. 2008 Sep 17. [Epub ahead of print]

Childhood outcomes after prescription of antibiotics to pregnant women with spontaneous preterm labour: 7-year follow-up of the ORACLE II trial.

Kenyon S, Pike K, Jones D, Brocklehurst P, Marlow N, Salt A, Taylor D.

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BACKGROUND: The ORACLE II trial compared the use of erythromycin and/or amoxicillin-clavulanate (co-amoxiclav) with that of placebo for women in spontaneous preterm labour and intact membranes, without overt signs of clinical infection, by use of a factorial randomised design. The aim of the present study-the ORACLE Children Study II-was to determine the long-term effects on children after exposure to antibiotics in this clinical situation. **METHODS:** We assessed children at age 7 years born to the 4221 women who had completed the ORACLE II study and who were eligible for follow-up with a structured parental questionnaire to assess the child's health status. Functional impairment was defined as the presence of any level of functional impairment (severe, moderate, or mild) derived from the mark III Multi-Attribute Health Status classification system. Educational outcomes were assessed with national curriculum test results for children resident in England. **FINDINGS:** Outcome was determined for 3196 (71%) eligible children. Overall, a greater proportion of children whose mothers had been prescribed erythromycin, with or without co-amoxiclav, had any functional impairment than did those whose mothers had received no erythromycin (658 [42.3%] of 1554 children vs 574 [38.3%] of 1498; odds ratio 1.18, 95% CI 1.02-1.37). Co-amoxiclav (with or without erythromycin) had no effect on the proportion of children with any functional impairment, compared with receipt of no co-amoxiclav (624 [40.7%] of 1523 vs 608 [40.0%] of 1520; 1.03, 0.89-1.19). No effects were seen with either antibiotic on the number of deaths, other medical conditions, behavioural patterns, or educational attainment. However, more children whose mothers had received erythromycin or co-amoxiclav developed cerebral palsy than did those born to mothers who received no erythromycin or no co-amoxiclav, respectively (erythromycin: 53 [3.3%] of 1611 vs 27 [1.7%] of 1562, 1.93, 1.21-3.09; co-amoxiclav: 50 [3.2%] of 1587 vs 30 [1.9%] of 1586, 1.69, 1.07-2.67). The number needed to harm with erythromycin was 64 (95% CI 37-209) and with co-amoxiclav 79 (42-591). **INTERPRETATION:** The prescription of erythromycin for women in spontaneous preterm labour with intact membranes was associated with an increase in functional impairment among their children at 7 years of age. The risk of cerebral palsy was increased by either antibiotic, although the overall risk of this condition was low. **FUNDING:** UK Medical Research Council.

PMID: 18804276 [PubMed - as supplied by publisher]

14: J Perinat Med. 2008;36(4):335-40.

Relationships between umbilical cord arterial blood pH levels at delivery and Bayley Psychomotor Development Index scores in early childhood.

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AIMS: To correlate data on umbilical cord arterial blood pH (pHa) levels obtained at delivery with subsequent Bayley Psychomotor Development (PDI) scores determined on the same cohort of children at age 18 months. **METHODS:** At delivery, we obtained umbilical cord bloods for pHa levels along with other biological parameters. Following the birth cohort prospectively, at age 18 months we did a comprehensive, blinded neurodevelopmental examination to determine a PDI score for each child. **RESULTS:** Over the broad range of umbilical cord arterial blood pH levels from 7.03 to 7.52, no statistically significant correlation (Pearson correlation coefficient, -0.016, P=0.88) was found between pHa at delivery and PDI scores at age 18 months. To study our finding in greater detail, we formed a subset of the data consisting only of lower pHa levels at delivery (defined as ≤ 7.20) and subsequent PDI scores. In this data subset, we again found that no significant relationship existed (Pearson correlation coefficient, +0.003, P=0.99). **CONCLUSIONS:** Our findings are consistent with the evolving hypothesis that adverse neurological outcomes in children often have etiologies other than intrapartum fetal acidemia.

Publication Types:

Randomized Controlled Trial

Research Support, Non-U.S. Gov't

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