Cerebral Palsy ALLIANCE

NEWS
Cerebral Palsy Research

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Interventions and Management

1. J Pediatr Health Care. 2012 May;26(3):193-9. Epub 2010 Oct 2.

Bone health in children with cerebral palsy and epilepsy.

Aronson E, Stevenson SB.

Children with disabilities that limit mobility are at increased risk for osteoporosis. In the United States, 10 million people have osteoporosis and 34 million people are estimated to be at risk of acquiring this condition. Typically, bone fragility and osteoporosis have been associated with older adults; however, these problems can also affect children. The childhood and adolescent years are critically important in producing healthy bone mass. Yet cerebral palsy and epilepsy, which are both chronic disorders that frequently coexist, are predictors of muscular and skeletal compromise. Nurse practitioners should be aware of recommendations for promoting and achieving optimal bone health in children with these disabilities and screening patients who are at risk of sustaining fractures.

PMID: 22525999 [PubMed - in process]

2. Acta Orthop Belg. 2012 Feb;78(1):111-6.

The key-muscle concept: a long-term low-dose injection strategy for botulinum toxin A treatment in cerebral palsy.

Placzek R, Salem KH, Meiss LA, Siebold D, Drescher W.

Center for Musculoskeletal Surgery, Charite--Universitätsmedizin Berlin, Germany.

Botulinum toxin (BoNT) is a well established treatment in cerebral palsy. A uniform dose strategy is, however, missing. We reviewed 35 children with spastic cerebral palsy treated with BoNT according to a newly-developed Key-Muscle concept. All patients received at least 4 BoNT treatments. Systemic side effects or secondary non-response were not observed. After a mean follow-up of 303 months, none of these patients needed bone surgery whereas 6 underwent soft tissue procedures. The Key-Muscle concept is a safe and effective treatment in spastic cerebral palsy. It respects the need for long-term therapy during motor development. Contractures and lever arm disease can be avoided.

PMID: 22523937 [PubMed - in process]

3. J Hand Surg Eur Vol. 2012 Apr 23. [Epub ahead of print]

Brachialis muscle transfer to the forearm for the treatment of deformities in spastic cerebral palsy.

Ozkan T, Bicer A, Aydin HU, Tuncer S, Aydin A, Hosbay ZY.

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The use of the brachialis muscle for tendon transfers in cerebral palsy has not been described previously. In this study, the brachialis muscle was used for transfer in 11 patients with spastic cerebral palsy for the restoration of forearm supination, wrist extension, or finger extension.Four patients underwent brachialis rerouting supinatorplasty. Active supination increased in two (60° and 50°), minimally increased in one (5°), and did not change in one patient. Five patients had a brachialis to extensor carpi radialis brevis transfer. The mean gain in postoperative active wrist extension was 65°. Two patients with finger flexion deformity and no active metacarpophalangeal joint movement underwent a brachialis to extensor digitorum communis transfer, and they attained an improved posture of finger extension although their postoperative metacarpophalangeal flexion-extension movement arc was 5° and 25°. None of the patients developed any loss of active flexion at the elbow. Our preliminary experience suggests that the brachialis muscle may serve as an alternative tendon transfer in cerebral palsy.

PMID: 22526513 [PubMed - as supplied by publisher]

4. J Hand Surg Eur Vol. 2012 Apr 23. [Epub ahead of print]

Why is joint range of motion limited in patients with cerebral palsy?

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Patients with spastic cerebral palsy of the upper limb typically present with various problems including an impaired range of motion that affects the positioning of the upper extremity. This impaired range of motion often develops into contractures that further limit functioning of the spastic hand and arm. Understanding why these contractures develop in cerebral palsy will affect the selection of patients suitable for surgical treatment as well as the choice for specific surgical procedures. The generally accepted hypothesis in patients with spastic cerebral palsy is that the hyper-excitability of the stretch reflex combined with increased muscle tone result in extreme angles of the involved joints at rest. Ultimately, these extreme joint angles are thought to result in fixed joint postures. There is no consensus in the literature concerning the pathophysiology of this process. Several hypotheses associated with inactivity and overactivity have been tested by examining the secondary changes in spastic muscle and its surrounding tissue. All hypotheses implicate different secondary changes that consequently require different clinical approaches. In this review, the different hypotheses concerning the development of limited joint range of motion in cerebral palsy are discussed in relation to their secondary changes on the musculoskeletal system.

PMID: 22526515 [PubMed - as supplied by publisher]

5. Disabil Rehabil Assist Technol. 2012 Apr 26. [Epub ahead of print]

Adapted bikes-what children and young people with cerebral palsy told us about their participation in adapted dynamic cycling.

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Purpose: Children and young people with Cerebral Palsy have limited opportunities for participation and there has

been limited research to explore this concept. Adapted dynamic cycling (ADC) is one activity that can enable them to participate in the community. The aim of this paper is to report the views and experiences of children and young people with CP and their families regarding their participation in ADC. Methods: This was part of a mixed methods study of which the qualitative findings are reported here. Iterative creative methods were developed which involved semi-structured interviews and diaries about the ADC experience. Results: The themes that emerged were the staff and the environment at the cycling hire project, the facilitators and barriers to ADC, the technical set up of the bike and the impact on the child and family in terms of developments over time, future aspirations, learning cycling skills, social participation and health benefits. Conclusions: The data showed that children's experiences of ADC were fun and enjoyable. This fun exercise should be incorporated into a physiotherapy programme as part of the child or young person with CP's rehabilitation. Policy makers and parents may find the information useful to increase the child's participation. [Box: see text].

PMID: 22536951 [PubMed - as supplied by publisher]

6. Dev Med Child Neurol. 2012 Apr 24. doi: 10.1111/j.1469-8749.2012.04284.x. [Epub ahead of print]

Psychometric properties of functional mobility tools in hereditary spastic paraplegia and other childhood neurological conditions.

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Aim: To evaluate studies on the psychometric properties of measurement tools used to quantify functional mobility in children with hereditary spastic paraplegia (HSP) and other childhood neurological conditions. Method: Two independent reviewers identified measures previously used by clinicians to quantify functional mobility. Because our primary interest was HSP, the first search identified measurement tools in studies that included those with HSP. To enhance the generalizability, the second search examined the reliability, validity, and responsiveness of tools in children with a range of neurological conditions such as cerebral palsy, spinal muscular atrophy, Down syndrome, and traumatic brain injury. The Consensus-based Standards for the Selection of Health Measurement Instruments was used to rate the methodological quality of identified articles. Results: The Gillette Functional Assessment Questionnaire (FAQ), the Functional Mobility Scale (FMS), the Gross Motor Function Measure (GMFM), the Rivermead Motor Assessment, and the Walking Index for Spinal Cord Injury II were identified for quantifying functional mobility. The FMS and GMFM were reliable, valid, and responsive to changes across a range of childhood neurological conditions. The FAQ was reliable and valid for measuring functional mobility in similar populations. Interpretation: The FAQ, FMS, and GMFM are valid, reliable, and responsive measures in children with a range of neurological conditions.

PMID: 22524640 [PubMed - as supplied by publisher]

7. Disabil Rehabil Assist Technol. 2012 Apr 25. [Epub ahead of print]

Ankle-foot orthotic management in neuromuscular disorders: recommendations for future research.

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Purpose: To describe research evidence supporting clinical recommendations for ankle-foot orthotic (AFO) prescription and examine common limitations in current research among individuals with stroke and cerebral palsy. Method: Three databases and one journal website were searched for articles reporting AFO interventions on gait and functional mobility outcome measures in participants with stroke or cerebral palsy. The International Society for Prosthetics and Orthotics (ISPO) best practice recommendations from consensus conferences were reviewed. Data extracted from the articles include participant characteristics, AFO intervention details, evaluation methods, and outcome measures. Results: Sixty articles were included; twenty-seven on stroke and thirty-three on cerebral palsy

participants. Many articles reported insufficient detail on severity of lower limb impairment. Type of interventions included nineteen nonarticulating AFO studies, twelve articulating AFO studies and twenty-three studies testing both. Confounding factors, such as compliance, activity level and footwear, need to be considered in longitudinal studies. Conclusions: Most studies demonstrated improvement in walking speed and ankle dorsiflexion, whereas the indirect effect on knee stability remains unclear. Future research needs to provide detailed information on type and severity of lower limb impairment of participants and design features of the AFO intervention.

PMID: 22533384 [PubMed - as supplied by publisher]

8. Gait Posture. 2012 Apr 20. [Epub ahead of print]

Potential of lower-limb muscles to accelerate the body during cerebral palsy gait.

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Two of the most common gait patterns in children with spastic diplegic cerebral palsy (CP) are termed 'crouch gait' and 'jump gait'. While outcomes of surgical interventions designed to improve functional mobility are generally positive, many children displaying these gait patterns show minimal or no improvement post-surgery. A poor response to treatment may be partially attributable to incorrect interpretations of muscle function. Computational techniques that assess muscle function may help address this issue, but before studying specific surgeries, the gait patterns themselves must be better understood. The aim of this study was to identify differences in lower-limb muscle function when comparing crouch, jump and able-bodied gait patterns by quantifying the potential of lower-limb muscles to accelerate the body's center of mass. A muscle's potential acceleration was defined as the acceleration induced by a unit of muscle force. Dynamic simulations of walking using musculoskeletal models were developed for eight children with crouch gait, ten with jump gait, and ten controls. There were significant differences ($p<0.05$) in muscle potential accelerations between crouch and able-bodied gait patterns, and between jump and able-bodied gait patterns, for most of the major muscles of the hip, knee, and ankle. One important outcome was the identification of the significantly reduced potential of gluteus medius to extend the hip in both crouch gait and jump gait. Potential acceleration analyses appear to be suitable for evaluating differences between common gait patterns and may also be applied to study the effects of surgical treatments. The results of such studies may lead to improved treatment outcomes for individuals with impaired mobility.

PMID: 22522045 [PubMed - as supplied by publisher]

9. Res Dev Disabil. 2012 Apr 19;33(5):1418-1428. [Epub ahead of print]

Is interlimb coordination during walking preserved in children with cerebral palsy?

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Arm movements during gait in children with cerebral palsy (CP) are altered compared to typically developing children (TD). We investigated whether these changes in arm movements alter interlimb coordination in CP gait. 3D gait analysis was performed in CP (diplegia [DI]: N=15 and hemiplegia [HE]: N=11) and TD (N=24) children at preferred and fast walking speeds. Mean Relative Phase (MRP, i.e. mean over the gait cycle of the Continuous Relative Phase or CRP) was calculated as a measure of coordination, standard deviation of CRP was used as a measure of coordinative stability, and the sign of MRP indicated which limb was leading (for all pair combinations of the four limbs). In HE, coordination was significantly altered, less stable and a different leading limb was found compared to TD whenever the most affected arm was included in the studied limb pair. In DI, coordination deteriorated significantly when any of the two legs was included in the studied limb pair, and coordinative stability was significantly affected when any of the two arms was included. In almost all limb pair combinations, a different limb was leading in DI compared to TD. Increasing walking speed significantly improved coordination and coordinative stability of several limb pairs in DI. Coordination and limb-leading deficits were mostly linked to the

affected limb. The compensating (non-affected) arm primarily affected coordinative stability, which underlines the importance of active arm movements in HE. Increasing walking speed may be used to improve interlimb coordination in DI.

PMID: 22522200 [PubMed - as supplied by publisher]

10. Gait Posture. 2012 Apr 21. [Epub ahead of print]

Correlation of radiographic and pedobarograph measurements in planovalgus foot deformity.

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Planovalgus foot deformity is common in children with cerebral palsy. Several pathologies contribute to the deformity. It begins with the lateral displacement of the navicular and the talar head becomes uncovered and prominent in the medial side of the midfoot. The purpose of this study was to assess the correlation between the radiographic and the pedobarographic measurements and the ability to predict foot pressure components using radiographic measurement. The patient sample included 43 patients with cerebral palsy who were ambulatory and had planovalgus foot deformity (76 feet). Medial midfoot pressure showed correlation with talonavicular uncoverage index, talonavicular angle, medial arch angle, Meary angle, and lateral talocalcaneal angle. Heel impulse showed negative correlation with talonavicular uncoverage index and talonavicular angle. Simple linear regression was used to assess the relationship between radiographic and foot pressure component measurements. For every unit change in talonavicular uncoverage index, the predicted value of medial midfoot pressure was [9.9+27 (talonavicular uncoverage index)]. This equation accounted for 17.9% of the changes in the medial midfoot pressure. Tibial foot angle and maximum knee extension also contributed to the heel impulse. The radiographic indices of the planovalgus foot can explain the changes in some foot pressure components.

PMID: 22525421 [PubMed - as supplied by publisher]

11. Phys Med Rehabil Clin N Am. 2012 May;23(2):343-7. Epub 2012 Apr 10.

Safety considerations for patients with communication disorders in rehabilitation medicine settings.

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Communication barriers can pose a significant safety risk for patients. Individuals in a communication-vulnerable state are commonly seen in rehabilitation settings. These patients cannot adequately communicate their symptoms, wants, and needs to providers. Causes of communication barriers include neurologic impairments, such as stroke, cerebral palsy, and Parkinson disease, and language barriers. The ability of clinicians to adequately diagnose, treat, and monitor these patients is also hindered. This article identifies key communication barriers and strategies that clinicians can use to effectively communicate with these patients.

PMID: 22537697 [PubMed - in process]

12. Acta Paediatr. 2012 Jun;101(6):618-23. doi: 0.1111/j.1651-2227.2012.02603.x. Epub 2012 Feb 11.

Sleep problems in children with cerebral palsy and their relationship with maternal sleep and depression.

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Aim: To compare sleep problems in children with cerebral palsy to typically developing children. To study the relationship between sleep problems in children with cerebral palsy and maternal sleep quality and depression. Methods: Fifty-seven children with cerebral palsy aged 4-12 years were identified from a UK disability database. Maternal sleep disturbance and mood were assessed using the Pittsburgh Sleep Quality Index and the Major Depression Inventory. Child sleep problems, assessed with the Children's Sleep Habits Questionnaire, but not maternal variables, were compared to 102 typically developing children. Results: Forty children (70%) were recruited with a mean age of 7.8 (SD 2.4). Sleep anxiety, night wakings, parasomnias and sleep-disordered breathing sub-scales indicated significantly more difficulties than in typically developing children. 40% of mothers of children with cerebral palsy had poor sleep quality of whom 44% had depressed mood. Child and maternal sleep disturbance were significantly correlated. Maternal sleep quality predicted 50% of the variance in maternal depression. Conclusions: Children with cerebral palsy have more sleep problems than typically developing peers. Their mothers also have disturbed sleep that correlates with maternal depression. Childhood sleep problems can be treated and should be identified in routine clinical practice.

PMID: 22536813 [PubMed - in process]

13. Res Dev Disabil. 2012 Apr 19;33(5):1503-1507. [Epub ahead of print]

Does intellectual disability affect the development of dental caries in patients with cerebral palsy?

Moreira RN, Alcântara CE, Mota-Veloso I, Marinho SA, Ramos-Jorge ML, Oliveira-Ferreira F.

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The aim of this study was to evaluate if the severity of intellectual disability is a factor that affects the development of dental cavities in patients with cerebral palsy. This cross-sectional study was conducted on 165 individuals who were selected from a physical rehabilitation center, a special public school and a regular public school. Of these, 76 individuals had been diagnosed with spastic cerebral palsy and 89 had no neurological impairment. The subjects were matched based on age and gender and selected randomly by lottery. All patients were examined to determine the number of dental cavities, and tested for their intellectual functioning (Raven Test) and motor abilities. The study showed that children with CP who presented with intellectual disabilities had a larger number of dental cavities than children with CP without intellectual disabilities. Considering intellectual functioning and motor impairment in the multivariate logistic regression, only intellectual functioning was found to have a significant effect on the development of dental cavities. These results suggest that intellectual disability can be considered a contributing factor for the development of dental caries in patients with cerebral palsy.

PMID: 22522208 [PubMed - as supplied by publisher]

14. Brain Dev. 2012 Apr 18. [Epub ahead of print]

Passive toothbrushing-induced seizures: Report of a severely disabled girl.

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Toothbrushing-induced seizures are rare reflex seizures triggered by the brushing of one's own teeth. We encountered an 11-year-old girl with severe mental retardation, hypotonic cerebral palsy and epilepsy who presented with toothbrushing-induced seizures. She had had spontaneous brief tonic seizures several times a day since the age of 1 year and 2 months and started presenting with the same type of seizures induced by toothbrushing from the age of 8 years. As she could not brush her teeth by herself due to her disabilities, her mother brushed her teeth daily for her. The interictal EEG showed spike-and-wave complexes in the frontal regions bilaterally. The [Tc-99m]HMPAO-SPECT at the time of the seizure induced by toothbrushing suggested that the seizures originated from the left perisylvian cortex. This is the first report of toothbrushing-induced seizures triggered by the brushing of the patient's teeth by another person ('passive toothbrushing').

PMID: 22521108 [PubMed - as supplied by publisher]

15. Phys Med Rehabil Clin N Am. 2012 May;23(2):393-400. Epub 2012 Mar 28.

Patient safety in the rehabilitation of children with traumatic brain injury and cerebral palsy.

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With the advent of newer and better therapies available, patient safety is emerging as a new topic. Pediatric patient safety is relatively new, in that there are few guidelines available. Safety in children with traumatic brain injury (TBI) given the incidence of TBI is very vital. This is an attempt to identify the key points in TBI.

PMID: 22537701 [PubMed - in process]

16. Res Dev Disabil. 2012 Apr 23;33(5):1594-1604. [Epub ahead of print]

Measuring the concept of impact of childhood disability on parents: Validation of a multidimensional measurement in a cerebral palsy population.

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Living with a child with a disability can affect family life in various domains. Impacts on time, expenses, work, relationships within the family, social relationships and physical and psychological health can be observed. The Family Impact of Childhood Disability (FICD) is a specific instrument designed to assess this situation. Used in a cross-sectional survey, this questionnaire was extended to consider two missing aspects: impact on work and health (FICD+4). This paper addresses the psychometric qualities of the FICD in Europe among parents living with an adolescent with cerebral palsy. Expecting the FICD+4 could assess detailed impact dimensions, an exploratory analysis was conducted. We interviewed 242 families of 13- to 17-year-old adolescents with cerebral palsy living in Europe. Good psychometric properties were found in negative and positive FICD scales and in six underlying factors extracted from exploratory factor analysis on FICD+4. These results support the psychometric validity of the FICD in the assessment of the impact of disability in European families who live with an adolescent with cerebral

palsy. They also highlight the multifaceted aspects of the impact of childhood disability on the family and suggest that the FICD+4 is a good tool for assessing specific negative impacts on time, finances, work, social relationships and positive impacts on parental feeling and family attitude. This scale needs further validation and could be helpful for research and clinical interventions.

PMID: 22534397 [PubMed - as supplied by publisher]

17. Res Dev Disabil. 2012 Apr 19;33(5):1380-1388. [Epub ahead of print]

Theory of mind and irony comprehension in children with cerebral palsy.

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The main goal of the present study was to characterise the pragmatic abilities of French children with cerebral palsy through their understanding of irony and other people's mental states. We predicted that children with cerebral palsy would have difficulty understanding false-belief and ironic remarks, due to the executive dysfunction that accompanies the motor disorders of cerebral palsy. We conducted an experiment in which children with cerebral palsy and typically developing matched controls performed theory-of-mind and executive function tasks. They then listened to ironic stories and answered questions about the speakers' beliefs and attitudes. The groups differed significantly on second-order theory of mind, irony comprehension and working memory, indicating pragmatic difficulties in children with cerebral palsy.

PMID: 22522196 [PubMed - as supplied by publisher]

18. Ann Neurol. 2012 Apr;71(4):520-30. doi: 10.1002/ana.22685.

Sepiapterin reductase deficiency: A Treatable Mimic of Cerebral Palsy.

Friedman J, Roze E, Abdenur JE, Chang R, Gasperini S, Saletti V, Wali GM, Eiroa H, Neville B, Felice A, Parascandalo R, Zafeiriou DI, Arrabal-Fernandez L, Dill P, Eichler FS, Echenne B, Gutierrez-Solana LG, Hoffmann GF, Hyland K, Kusmierska K, Tijssen MA, Lutz T, Mazzuca M, Penzien J, Poll-The BT, Sykut-Cegielska J, Szymanska K, Thöny B, Blau N.

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OBJECTIVE: Sepiapterin reductase deficiency (SRD) is an under-recognized levodopa-responsive disorder. We describe clinical, biochemical, and molecular findings in a cohort of patients with this treatable condition. We aim to improve awareness of the phenotype and available diagnostic and therapeutic strategies to reduce delayed diagnosis or misdiagnosis, optimize management, and improve understanding of pathophysiologic mechanisms. METHODS: Forty-three individuals with SRD were identified from 23 international medical centers. The phenotype and treatment response were assessed by chart review using a detailed standardized instrument and by literature review for cases for which records were unavailable. RESULTS: In most cases, motor and language delays, axial hypotonia, dystonia, weakness, oculogyric crises, and diurnal fluctuation of symptoms with sleep benefit become evident in infancy or childhood. Average age of onset is 7 months, with delay to diagnosis of 9.1 years. Misdiagnoses of cerebral palsy (CP) are common. Most patients benefit dramatically from levodopa/carbidopa, often with further improvement with the addition of 5-hydroxytryptophan. Cerebrospinal fluid findings are distinctive. Diagnosis is confirmed by mutation analysis and/or enzyme activity measurement in cultured fibroblasts. INTERPRETATION: Common, clinical findings of SRD, aside from oculogyric crises and diurnal fluctuation, are nonspecific and mimic CP with hypotonia or dystonia. Patients usually improve dramatically with treatment. Consequently, we recommend consideration of SRD not only in patients with levodopa-responsive motor disorders, but also in patients with developmental delays with axial hypotonia, and patients with unexplained or atypical

presumed CP. Biochemical investigation of cerebrospinal fluid is the preferred method of initial investigation. Early diagnosis and treatment are recommended to prevent ongoing brain dysfunction. ANN NEUROL 2012;

PMID: 22522443 [PubMed - in process]

Prevention and Cure

19. Ann Neurol. 2012 May;71(5):589-600. doi: 10.1002/ana.22670.

Cell therapy for neonatal hypoxia-ischemia and cerebral palsy.

Bennet L, Tan S, Van den Heuij L, Derrick M, Groenendaal F, van Bel F, Juul S, Back SA, Northington F, Robertson NJ, Mallard C, Gunn AJ.

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Perinatal hypoxic-ischemic brain injury remains a major cause of cerebral palsy. Although therapeutic hypothermia is now established to improve recovery from hypoxia-ischemia (HI) at term, many infants continue to survive with disability, and hypothermia has not yet been tested in preterm infants. There is increasing evidence from in vitro and in vivo preclinical studies that stem/progenitor cells may have multiple beneficial effects on outcome after hypoxic-ischemic injury. Stem/progenitor cells have shown great promise in animal studies in decreasing neurological impairment; however, the mechanisms of action of stem cells, and the optimal type, dose, and method of administration remain surprisingly unclear, and some studies have found no benefit. Although cell-based interventions after completion of the majority of secondary cell death appear to have potential to improve functional outcome for neonates after HI, further rigorous testing in translational animal models is required before randomized controlled trials should be considered. ANN NEUROL 2012;

PMID: 22522476 [PubMed - in process]

20. Cell Transplant. 2012 Apr 17. [Epub ahead of print]

Long-lasting paracrine effects of human cord blood cells (hUCBCs) on damaged neocortex in an animal model of cerebral palsy.

Bae SH, Kong TH, Lee HS, Kim KS, Hong KS, Chopp M, Kang MS, Moon J.

Neonatal asphyxia is an important contributor to cerebral palsy (CP), for which there is no effective treatment to date. The administration of human cord blood cells (hUCBCs) is emerging as a therapeutic strategy for the treatment of neurological disorders. However, there are few studies on the application of hUCBCs to the treatment of neonatal ischemia as a model of CP. Experiments and behavioral tests (mainly motor tests) performed on neonatal hypoxia/ischemia have been limited to short-term effects of hUCBCs, but mechanisms of action have not been investigated. We performed a study on the use of hUCBCs in a rat model of neonatal hypoxiaischemia and investigated the underlying mechanism for therapeutic benefits of hUCBCs treatment. hUCBCs were intravenously transplanted into a rat model of neonatal hypoxia ischemia. hUCBCs increased microglia temporarily in the periventricular striatum in the early phase of disease, protected mature neurons in the neocortex from injury, paved the way for the near-normalization of brain damage in the subventricular zone (SVZ), and in consequence, significantly improved performance in a battery of behavioral tests compared to the vehicle-treated group. Although the transplanted cells were rarely observed in brain 3 weeks after transplantation, the effects of the improved behavioral functions persisted. Our preclinical findings suggest that the long-lasting positive influence of hUCBCs is derived from paracrine effects of hUCBCs that stimulate recovery in the injured brain and protect against further brain damage.

PMID: 22524897 [PubMed - as supplied by publisher]

21. Cell Transplant. 2012;21 Suppl 1:91-8.

Effects of neural progenitor cell transplantation in children with severe cerebral palsy.

Luan Z, Liu W, Qu S, Du K, He S, Wang Z, Yang Y, Wang C, Gong X.

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Cerebral palsy (CP) is a chronic nervous system disease that severely damages the physical and developmental health of children. Traditional treatment brings about only improvement of mild to moderate CP, but severe CP still lacks effective interventions. To explore safety and efficacy of using neural progenitor cells (NPCs) to treat CP in children, we performed NPC transplantation in 45 patients with severe CP by injecting NPCs derived from aborted fetal tissue into the lateral ventricle. Gross motor function measures (GMFM), the Peabody Developmental Motor Scale-Fine Motor (PDMS-FM) test, and a unified survey questionnaire designed specifically for children with CP were used to evaluate neurological function of the patients. Motor development was significantly accelerated within the first month after cell transplantation, but the rate of improvement gradually slowed to preoperative levels. However, after 1 year, the developmental level in each functional sphere (gross motor, fine motor, and cognition) of the treatment group was significantly higher compared to the control group. No delayed complications of this therapy were noted. These results suggest that NPC transplantation is a safe and effective therapeutic method for treating children with severe CP.

PMID: 22507684 [PubMed - in process]

22. Cell Transplant. 2012;21 Suppl 1:79-90.

Administration of autologous bone marrow-derived mononuclear cells in children with incurable neurological disorders and injury is safe and improves their quality of life.

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Neurological disorders such as muscular dystrophy, cerebral palsy, and injury to the brain and spine currently have no known definitive treatments or cures. A study was carried out on 71 children suffering from such incurable neurological disorders and injury. They were intrathecally and intramuscularly administered autologous bone marrow-derived mononuclear cells. Assessment after transplantation showed neurological improvements in muscle power and a shift on assessment scales such as FIM and Brooke and Vignos scale. Further, imaging and electrophysiological studies also showed significant changes in selective cases. On an average follow-up of 15 ± 1 months, overall 97% muscular dystrophy cases showed subjective and functional improvement, with 2 of them also showing changes on MRI and 3 on EMG. One hundred percent of the spinal cord injury cases showed improvement with respect to muscle strength, urine control, spasticity, etc. Eighty-five percent of cases of cerebral palsy cases showed improvements, out of which 75% reported improvement in muscle tone and 50% in speech among other symptoms. Eighty-eight percent of cases of other incurable neurological disorders such as autism, Retts Syndrome, giant axonal neuropathy, etc., also showed improvement. No significant adverse events were noted. The results show that this treatment is safe, efficacious, and also improves the quality of life of children with incurable neurological disorders and injury.

PMID: 22507683 [PubMed - in process]

23. Exp Neurol. 2012 Apr 15. [Epub ahead of print]

Rodent neonatal germinal matrix hemorrhage mimics the human brain injury, neurological consequences, and post-hemorrhagic hydrocephalus.

Lekic T, Manaenko A, Rolland W, Krafft PR, Peters R, Hartman RE, Altay O, Tang J, Zhang JH.

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Germinal matrix hemorrhage (GMH) is the most common neurological disease of premature newborns. GMH causes neurological sequelae such as cerebral palsy, post-hemorrhagic hydrocephalus, and mental retardation. Despite this, there is no standardized animal model of spontaneous GMH using newborn rats to depict the condition. We asked whether stereotactic injection of collagenase type VII (0.3 U) into the ganglionic eminence of neonatal rats would reproduce the acute brain injury, gliosis, hydrocephalus, periventricular leukomalacia, and attendant neurological consequences found in humans. To test this hypothesis, we used our neonatal rat model of collagenase-induced GMH in P7 pups, and found that the levels of free-radical adducts (nitrotyrosine and 4-hyroxynonenal), proliferation (mammalian target of rapamycin), inflammation (COX-2), blood components (hemoglobin and thrombin), and gliosis (vitronectin and GFAP) were higher in the forebrain of GMH pups, than in controls. Neurobehavioral testing showed that pups with GMH had developmental delay, and the juvenile animals had significant cognitive and motor disability, suggesting clinical relevance of the model. There was also evidence of white-matter reduction, ventricular dilation, and brain atrophy in the GMH animals. This study highlights an instructive animal model of the neurological consequences after germinal matrix hemorrhage, with evidence of brain injuries that can be used to evaluate strategies in the prevention and treatment of post-hemorrhagic complications.

PMID: 22524990 [PubMed - as supplied by publisher]

24. IEEE Trans Neural Syst Rehabil Eng. 2012 Apr 18. [Epub ahead of print]

An Optical Flow Based Method to Predict Infantile Cerebral Palsy.

Stahl A, Schellewald C, Stavdahl O, Aamo O, Adde L, Kirkerod H.

Cerebral palsy (CP) is a perinatally acquired nonprogressive brain damage resulting in motor impairment affecting mobility and posture. Early identification of infants with CP is desired to target early interventions and follow-up. During early infancy, distinct motion patterns occur which are highly predictive for later disability. These motor patterns can be observed and recorded. In the present paper a method to predict later CP based on early video recordings of the infants spontaneous movements, applying optical flow and statistical pattern recognition, is presented. We extract motion information from video recordings of young infants using a total variation related optical flow method. By using wavelet analysis features from motion trajectories of points initiated on a regular grid were extracted and classified using a support vector machine (SVM).

PMID: 22531824 [PubMed - as supplied by publisher]

25. Indian J Pediatr. 2012 Apr 14. [Epub ahead of print]

Outcome of Meningitis among Children Less than 2-y-old in Haryana.

Singhi SC, Gupta M, Kumar D, Kumar R.

Department of Pediatrics, Advanced Pediatric Centre, Chandigarh, India.

Incidence of neurological complications and disability following meningitis among children less than 2 y in a community setting in Haryana was assessed. Cases were enrolled from hospitals of in Yamunanagar district. They were first assessed for disability or neurological complications at their home by health workers 1 y after hospital discharge using standard WHO ten questionnaire screening tool, and then by medical officers; finally they were

examined by a pediatrician. Eighty one children could be contacted from a total of 91 meningitis cases. Among these 16 children had died (case fatality ratio 19.7 %). Among 65 survivors, disability was observed in 11 (17 %), and neurological complications were found in 24 (37 %) children. Microcephaly (8.6 %), seizures (6.7 %), cerebral palsy, hemiparesis and development deficit (some with hearing impairment, and language delay) were the major disabilities/neurological complications.

PMID: 22528695 [PubMed - as supplied by publisher]

26. Nurs Law Regan Rep. 2012 Mar;52(10):2.

Cerebral palsy does not mean nurse or Dr. negligent. Case on point: Trudeau v. Physicians Ins. Co. of Wisconsin, Inc., 201AP2615 (3/6/2012)-WI.

[No authors listed]

PMID: 22519288 [PubMed - in process]

27. Obstet Gynecol. 2012 May;119(5):1056-7.

Application of criteria developed by the task force on neonatal encephalopathy and cerebral palsy to acutely asphyxiated neonates.

Phelan JP, Korst LM, Martin GI.

Childbirth Injury Prevention Foundation, City of Industry, California (Phelan) University of Southern California Keck School of Medicine, Department of Obstetrics and Gynecology, Los Angeles, California (Korst) Department of Neonatology, Citrus Valley Medical Center, West Covina, California (Martin).

PMID: 22525924 [PubMed - in process]

28. Obstet Gynecol. 2012 May;119(5):1056.

Application of criteria developed by the task force on neonatal encephalopathy and cerebral palsy to acutely asphyxiated neonates.

Philopoulos D.

Paris, France.

PMID: 22525923 [PubMed - in process]

29. Pediatrics. 2012 Apr 23. [Epub ahead of print]

Qualitative Brain MRI at Term and Cognitive Outcomes at 9 Years After Very Preterm Birth.

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OBJECTIVE: A prospective study was performed to assess the relationship between the appearance of cerebral MRI at term and the cognitive functioning at 9 years old in very preterm born infants. METHODS: Seventy-six very preterm born infants (birth weight <1500 g or gestational age ≤32 weeks) obtained cerebral MRI at term-equivalent period, which was assessed by using established composite scores for the white and gray matter; cognitive outcomes at 9 years old were assessed in 60 subjects by using Wechsler Intelligence Scale for Children, Third Edition. RESULTS: Mildly low scores on the different IQ indices (<85) were observed in 23.3% (verbal IQ), 41.7%

(performance IQ), and 30.0% (full-scale IQ) of the cohort, whereas moderately low scores (<70) were noted in 3.3% (verbal IQ), 11.7% (performance IQ), and 11.7% (full-scale IQ); cerebral palsy was diagnosed in 10.0%, whereas special assistance at school was required in 56.7%. Abnormal white matter appearances predicted mildly low verbal, performance, and full-scale IQs; moderately low performance and full-scale IQs; cerebral palsy; and the requirement for special assistance at school. Abnormal white matter appearances predicted mild cognitive impairment even after the adjustment for known clinical risk factors. In contrast, abnormal gray matter appearances did not predict any of the outcome measures. CONCLUSIONS: In a cohort of very preterm born infants, abnormal white matter appearance on term MRI showed consistent associations with cognitive impairments at 9 years old, further supporting the benefit of obtaining term MRI for very preterm born infants.

PMID: 22529280 [PubMed - as supplied by publisher]

30. Scand J Immunol. 2012 Apr 26. doi: 10.1111/j.1365-3083.2012.02710.x. [Epub ahead of print]

Serial Examination of Serum IL-8, IL-10 and IL-1Ra Levels is Significant in Neonatal Seizures Induced by Hypoxic Ischemic Encephalopathy.

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We investigated changes in the levels of significant cytokines in relation to neonatal seizures, a pattern of cytokine concentrations serially and the severity of brain insult. The hypoxic ischemic encephalopathy induced seizure group consisted of 13 patients, and another 15 normal newborns were enrolled as a control group. All of the initial samples were obtained within the first 24 hrs of admission, and the second samples were obtained between 48 to 72 hrs in both groups. Only the third samples were taken in the seizure group on the 5(th) day. During neonatal seizures, the levels of most cytokines increased within 24 hrs, and, in particular, the levels of IL-8 significantly increased ($p<0.05$). After 48 to 72 hrs of seizure onset, the levels of most cytokines decreased, especially, IL-1Ra, however, IL-8 and IL-10 remained increased ($p<0.05$). During the prognosis, one patient who was diagnosed with quadriplegic cerebral palsy at 6 months of age presented extreme elevation of IL-1beta, IL-1Ra, IL-6, IL-8, IL-10 and TNF-alpha in the initial sample, reflecting the severity of their brain damage. A significant increase in IL-8 may serve as a biomarker for earlier detection of neonatal, if detected within 24 and 48-72 hrs of the seizure.

PMID: 22537067 [PubMed - as supplied by publisher]

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