Cerebral Palsy Alliance

NEWS
Cerebral Palsy Research

Monday 23 June 2014

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Interventions and Management

1. Iran J Child Neurol. 2014 Spring;8(2):45-52.

Associations between Manual Abilities, Gross Motor Function, Epilepsy, and Mental Capacity in Children with Cerebral Palsy.

Gajewska E, Sobieska M, Samborski W.

OBJECTIVE: This study aimed to evaluate gross motor function and hand function in children with cerebral palsy to explore their association with epilepsy and mental capacity. MATERIAL & METHODS: The research investigating the association between gross and fine motor function and the presence of epilepsy and/or mental impairment was conducted on a group of 83 children (45 girls, 38 boys). Among them, 41 were diagnosed with quadriplegia, 14 hemiplegia, 18 diplegia, 7 mixed form, and 3 athetosis. A neurologist assessed each child in terms of possible epilepsy and confirmed diagnosis in 35 children. A psychologist assessed the mental level (according to Wechsler) and found 13 children within intellectual norm, 3 children with mild mental impairment, 18 with moderate, 27 with severe, and 22 with profound. Children were then classified based on Gross Motor Function Classification System and Manual Ability Classification Scale. RESULTS: The gross motor function and manual performance were analysed in relation to mental impairment and the presence of epilepsy. Epilepsy was found to disturb conscious motor functions, but also higher degree of mental impairment was observed in children with epilepsy. CONCLUSION: The occurrence of epilepsy in children with cerebral palsy is associated with worse manual function. The occurrence of epilepsy is associated with limitations in conscious motor functions. There is an association between epilepsy in children with cerebral palsy and the degree of mental impairment. The occurrence of epilepsy, mainly in children with hemiplegia and diplegia is associated with worse mental capacities.

PMID: 24949051 [PubMed]

2. Dev Med Child Neurol. 2014 Jun 14. doi: 10.1111/dmcn.12513. [Epub ahead of print]

Neurophysiological abnormalities in the sensorimotor cortices during the motor planning and movement execution stages of children with cerebral palsy.

Kurz MJ1, Becker KM, Heinrichs-Graham E, Wilson TW.

AIM: This investigation used magnetoencephalography (MEG) to examine the neural oscillatory responses of the sensorimotor cortices during the motor planning and movement execution stages of children with typical

development and children with cerebral palsy (CP). METHOD: The study involved 13 children with CP (nine males, four females; mean [SD] age 14y 3mo [9mo], range 10-18y; height 1.61m [0.08m]; weight 52.65kg [13kg]), and 13 age- and sex-matched typically developing children (height 1.64m [0.06m]; weight 56.88kg [10kg]). The experiment required the children to extend their knee joint as whole-head MEG recordings were acquired. Beamformer imaging methods were employed to quantify the source activity of the beta-frequency (14-28Hz) event-related desynchronization (ERD) that occurs during the motor planning period, and the gamma-frequency (~50Hz) event-related synchronization (ERS) that occurs at the motor execution stage. RESULTS: The children with CP had a stronger mean beta ERD during the motor planning phase and reduced mean gamma ERS at the onset of movement. INTERPRETATION: The uncharacteristic beta ERD in the children with CP suggests that they may have greater difficulty planning knee joint movements. We suggest that these aberrant beta ERD oscillations may have a cascading effect on the gamma ERS, which ultimately affects the execution of the motor command.

PMID: 24931008 [PubMed - as supplied by publisher]

3. Gait Posture. 2014 May 9. pii: S0966-6362(14)00498-6. doi: 10.1016/j.gaitpost.2014.04.207. [Epub ahead of print]

Identification of the neural component of torque during manually-applied spasticity assessments in children with cerebral palsy.

Bar-On L1, Desloovere K1, Molenaers G2, Harlaar J3, Kindt T4, Aertbeliën E5.

Clinical assessment of spasticity is compromised by the difficulty to distinguish neural from non-neural components of increased joint torque. Quantifying the contributions of each of these components is crucial to optimize the selection of anti-spasticity treatments such as botulinum toxin (BTX). The aim of this study was to compare different biomechanical parameters that quantify the neural contribution to ankle joint torque measured during manually-applied passive stretches to the gastrocsoleus in children with spastic cerebral palsy (CP). The gastrocsoleus of 53 children with CP (10.9±3.7y; females n=14; bilateral/unilateral involvement n=28/25; Gross Motor Functional Classification Score I-IV) and 10 age-matched typically developing (TD) children were assessed using a manually-applied, instrumented spasticity assessment. Joint angle characteristics, root mean square electromyography and joint torque were simultaneously recorded during passive stretches at increasing velocities. From the CP cohort, 10 muscles were re-assessed for between-session reliability and 19 muscles were re-assessed 6 weeks post-BTX. A parameter related to mechanical work, containing both neural and non-neural components, was compared to newly developed parameters that were based on the modeling of passive stiffness and viscosity. The difference between modeled and measured response provided a quantification of the neural component. Both types of parameters were reliable (ICC>0.95) and distinguished TD from spastic muscles ($p<0.001$). However, only the newly developed parameters significantly decreased post-BTX ($p=0.012$). Identifying the neural and non-neural contributions to increased joint torque allows for the development of individually tailored tone management.

PMID: 24931109 [PubMed - as supplied by publisher]

4. J Clin Densitom. 2014 Jun 2. pii: S1094-6950(14)00169-3. doi: 10.1016/j.jocd.2014.04.122. [Epub ahead of print]

Adaptation of the Lateral Distal Femur DXA Scan Technique to Adults With Disabilities.

Henderson RC1, Henderson BA2, Kecskemethy HH3, Hidalgo ST4, Nikolova BA5, Sheridan K6, Harcke HT7, Thorpe DE8.

The technique that best addresses the challenges of assessing bone mineral density in children with neuromuscular impairments is a dual-energy X-ray absorptiometry (DXA) scan of the lateral distal femur. The purpose of this study was to adapt this technique to adults with neuromuscular impairments and to assess the reproducibility of these measurements. Thirty-one adults with cerebral palsy had both distal femurs scanned twice, with the subject removed and then repositioned between each scan (62 distal femurs, 124 scans). Each scan was

independently analyzed twice by 3 different technologists of varying experience with DXA (744 analyses). Precision of duplicate analyses of the same scan was good (range: 0.4%-2.3%) and depended on both the specific region of interest and the experience of the technologist. Precision was reduced when comparing duplicate scans, ranging from 7% in the metaphyseal (cancellous) region to 2.5% in the diaphyseal (cortical) region. The least significant change was determined as recommended by the International Society for Clinical Densitometry for each technologist and each region of interest. Obtaining reliable, reproducible, and clinically relevant assessments of bone mineral density in adults with neuromuscular impairments can be challenging. The technique of obtaining DXA scans of the lateral distal femur can be successfully applied to this population but requires a commitment to developing the necessary expertise.

PMID: 24932899 [PubMed - as supplied by publisher]

5. Res Dev Disabil. 2014 Jun 16;35(10):2278-2283. doi: 10.1016/j.ridd.2014.05.024. [Epub ahead of print]

Functional balance and gross motor function in children with cerebral palsy.

Pavão SL1, Barbosa KA2, Sato TD2, Rocha NA2.

AIMS: To compare scores of children with cerebral palsy (CP) at different levels of Gross Motor Function Classification System (GMFCS), using the Pediatric Balance Scale (PBS) and to assess whether it can be used to predict GMFCS levels in children with CP. METHODS: Fifty-eight children with CP levels I-V of GMFCS were assessed by PBS and grouped according to their GMFCS level. RESULTS: It was observed differences in PBS scores between GMFCS I and II and between GMFCS II and III groups. Discriminant analysis indicated a 67% accuracy for the PBS instrument in assessing the GMFCS level of children with CP. INTERPRETATION: PBS is able to detect differences among GMFCS levels I, II, and III of mild and moderate impairment. Accordingly, PBS can be used reliably in clinical practice to indicate the motor impairment level of such children. The results enable specify the expected tasks that are expected to be accomplished by the children in each GMFCS level, contributing with therapeutic planning and monitoring.

PMID: 24946267 [PubMed - as supplied by publisher]

6. Neuromodulation. 2014 Jun 19. doi: 10.1111/ner.12203. [Epub ahead of print]

Intrathecal Baclofen Pump Implantation in Prone Position for a Cerebral Palsy Patient With Severe Scoliosis: A Case Report.

Arishima H1, Kikuta KI.

BACKGROUND AND OBJECTIVE: Intrathecal baclofen (ITB) pump implantation for cerebral palsy (CP) patients is usually performed in the lateral position; however, it might be difficult for some patients with severe deformity to take a lateral position during surgery. METHOD: We report a case of ITB pump implantation in the prone position for a CP patient who exhibited uncontrollable opisthotonus with severe scoliosis. RESULT: ITB therapy effectively controlled her opisthotonus. CONCLUSION: Our findings suggest that ITB therapy may be useful for CP patients with uncontrollable spasticity, dystonia, or opisthotonus who are not able to take a lateral position for pump implantation due to deformities of their extremities and spine.

PMID: 24945783 [PubMed - as supplied by publisher]

7. J Pediatr Orthop B. 2014 Jun 19. [Epub ahead of print]

Radiological outcome of reconstructive hip surgery in children with gross motor function classification system IV and V cerebral palsy.

Zhang S1, Wilson NC, Mackey AH, Stott NS.

Hip subluxation is common in children with cerebral palsy (CP). The aim of this study was to describe the radiological outcome of reconstructive hip surgery in children with CP, gross motor function classification system (GMFCS) level IV and V, and determine whether the GMFCS level plays a predictive role in outcome. This was a retrospective cohort study conducted at a tertiary-level pediatric hospital with a CP hip surveillance program. Of 110 children with GMFCS IV and V CP registered for hip surveillance, 45 underwent reconstructive hip surgery between 1997 and 2009, defined as varus derotational proximal femoral osteotomy with or without additional pelvic osteotomy. Eleven children were excluded because of lack of 12-month follow-up (n=10) or missing clinical records (n=1). Thus, 21 GMFCS IV children (median age 6 years at surgery) and 13 GMFCS V children (median age 5 years at surgery), who underwent 58 index surgeries, were included in the study. Clinical records and radiology were reviewed. The two surgical groups were femoral osteotomy (varus derotational femoral osteotomy with an AO blade plate or femoral locking plate fixation), or femoral ostetotomy with additional pelvic osteotomy. Reimer's migration percentage (MP) was calculated from anteroposterior pelvis radiographs to determine the outcome for each hip independently. Failure was defined as MP of greater than 60% or further operation on the hip. Reconstructive surgeries were performed for 58 hips with a median preoperative MP of 55%. There were 15 failures at a median of 62 months, including nine failures in 35 GMFCS IV hips and six failures in 23 GMFCS V hips. Overall, GMFCS V hips tended to fail earlier, (hazard ratio 2.3) with a median time to failure of 78 and 39 months for GMFCS IV and V hips, respectively. Combined femoral and pelvic osteotomies had the lowest failure rates in both groups of patients. The GMFCS classification may have some predictive value for outcomes following reconstructive hip surgery, with surgery for GMFCS V hips tending to fail earlier.

PMID: 24950105 [PubMed - as supplied by publisher]

8. Res Dev Disabil. 2014 Jun 16;35(10):2261-2266. doi: 10.1016/j.ridd.2014.05.020. [Epub ahead of print]

Gait pattern differences in children with unilateral cerebral palsy.

Szopa A1, Domagalska-Szopa M2, Czamara A3.

Children with cerebral palsy (CP) often have atypical body posture patterns and abnormal gait patterns resulting from functional strategies to compensate for primary anomalies that are directly attributable to damage to the central nervous system. Our previous study revealed two different postural patterns in children with unilateral CP: (1) a pattern with overloading of the affected body side and (2) a pattern with under-loading of the affected side. The purpose of present study was to test whether different gait patterns dependent on weight distribution between the affected and unaffected body sides could be detected in these children. The study included 45 outpatients with unilateral CP and 51 children with mild scoliosis (reference group). The examination consisted of two inter-related parts: paedobarographic measurements of the body mass distribution between the body sides and three-dimensional instrumented gait analysis. Using cluster analysis based on the Gillette Gait Index (GGI) values, three gait patterns were described: a scoliotic gait pattern and two hemiplegic gait patterns, corresponding to overloading/under-loading of the hemi-side, which are the pro-gravitational gait pattern (PGP) and the anti-gravitational gait pattern (AGP), respectively. The results of this study showed that subjects with AGP presented a higher degree of deviation from the normal gait than children with PGP. This proof that there are differences in the GGI between the AGP and PGP could be a starting point to identify kinematic differences between these gaits in a follow-up study.

PMID: 24946266 [PubMed - as supplied by publisher]

9. Dev Neurorehabil. 2014 Jun 20:1-6. [Epub ahead of print]

An innovative cycling exergame to promote cardiovascular fitness in youth with cerebral palsy: A brief report.

Knights S1, Graham N, Switzer L, Hernandez H, Ye Z, Findlay B, Xie WY, Wright V, Fehlings D.

Objective: To evaluate the effects of an internet-platform exergame cycling programme on cardiovascular fitness of youth with cerebral palsy (CP). Methods: In this pilot prospective case series, eight youth with bilateral spastic CP, Gross Motor Functional Classification System (GMFCS) level III, completed a six-week exergame programme. Outcomes were obtained at baseline and post-intervention. The primary outcome measure was the GMFCS III-specific shuttle run test (SRT-III). Secondary outcomes included health-related quality of life (HQL) as measured by the KIDSCREEN-52 questionnaire, six-minute walk test, Wingate arm cranking test and anthropomorphic measurements. Results: There were significant improvements in the SRT-III (t=-2.5, p=0.04, d=0.88) post-intervention. There were no significant changes in secondary outcomes. Conclusion: An exergame cycling programme may lead to improvement in cardiovascular fitness in youth with CP. This study was limited by small sample size and lack of a comparison group. Future research is warranted.

PMID: 24950349 [PubMed - as supplied by publisher]

10. Orthopade. 2014 Jun 19. [Epub ahead of print]

Principles of treatment of spastic palsy in children : A critical review [Article in German]

Brunner R.

BACKGROUND: In patients with cerebral palsy who are able to walk the source of the problem of spasticity must first be correctly determined. The weakness appears to be the main problem and the first line treatment must concentrate on improvement of strength and bodily control. THERAPY: Spasticity can also compensate for weaknesses. The indications for weakening measures for correction of muscle tonus must therefore be carefully appraised but are part of the repertoire. Orthoses result in stability and correction of deformities. Night braces are in our experience of doubtful value. Biomechanical objectives are a right-angle between the sole of the shoe and lower leg axis (leading edge of the tibia) and full passive and active extension in the knees and hips. CONCLUSION: Severely handicapped patients often suffer from hip luxation and scoliosis. Regular control of the hips and spine under loading are necessary. Early interventions, conservative and operative, have a better prognosis than a late correction. In general patients who have a risk for deformities and dysfunction of the musculoskeletal system due to the underlying disease should undergo early orthopedic control.

PMID: 24939715 [PubMed - as supplied by publisher]

11. Eur J Paediatr Neurol. 2014 Jun 4. pii: S1090-3798(14)00086-5. doi: 10.1016/j.ejpn.2014.05.007. [Epub ahead of print]

Relevance of intraglandular injections of Botulinum toxin for the treatment of sialorrhea in children with cerebral palsy: A review.

Porte M1, Chaléat-Valayer E2, Patte K3, D'Anjou MC4, Boulay C5, Laffont I6.

BACKGROUND: After the age of 4 years, drooling becomes pathological and impacts the quality of life of children with cerebral palsy. Intraglandular injection of Botulinum toxin is one of the treatments available to limit this phenomenon. AIMS: The objectives of this review were to validate the efficacy of Botulinum toxin injections for drooling in children with cerebral palsy, determine recommendations and identify potential side effects. METHODS: We conducted a literature review from 2001 in the following databases: Embase, Pubmed and Cochrane using the keywords: sialorrhea, drooling, hypersalivation, Botulinum toxin, cerebral palsy and children. Only the articles evaluating the efficacy of Botulinum toxin in children with cerebral palsy over the age of 4 were researched. RESULTS: Eight studies were found: 2 case studies, 3 open and non-controlled studies and 3 randomized controlled trials. Efficacy results in this indication are quite encouraging and the use of BTX injections is safe but the overall level of evidence of these studies was quite low. CONCLUSION: However, intraglandular injection of

Botulinum toxin has a place among the therapeutic array available for the management of sialorrhea in this population even if no standardized protocol is available yet.

PMID: 24931915 [PubMed - as supplied by publisher]

12. Augment Altern Commun. 2014 Jun 20:1-15. [Epub ahead of print]

Reliability and Validity of the C-BiLLT: A new Instrument to Assess Comprehension of Spoken Language in young Children with Cerebral Palsy and Complex Communication Needs.

Geytenbeek JJ1, Mokkink LB, Knol DL, Vermeulen RJ, Oostrom KJ.

In clinical practice, a variety of diagnostic tests are available to assess a child's comprehension of spoken language. However, none of these tests have been designed specifically for use with children who have severe motor impairments and who experience severe difficulty when using speech to communicate. This article describes the process of investigating the reliability and validity of the Computer-Based Instrument for Low Motor Language Testing (C-BiLLT), which was specifically developed to assess spoken Dutch language comprehension in children with cerebral palsy and complex communication needs. The study included 806 children with typical development, and 87 nonspeaking children with cerebral palsy and complex communication needs, and was designed to provide information on the psychometric qualities of the C-BiLLT. The potential utility of the C-BiLLT as a measure of spoken Dutch language comprehension abilities for children with cerebral palsy and complex communication needs is discussed.

PMID: 24948533 [PubMed - as supplied by publisher]

13. Matern Child Health J. 2014 Jun 21. [Epub ahead of print]

The Heterogeneity in Financial and Time Burden of Caregiving to Children with Chronic Conditions.

Zan H1, Scharff RL.

We examine the financial and time burdens associated with caring for children with chronic conditions, focusing on disparities across types of conditions. Using linked data from the 2003 to 2006 National Health Interview Survey and 2004-2008 Medical Expenditure Panel Survey, we created measures of financial burden (out-of-pocket healthcare costs, the ratio of out-of-pocket healthcare costs to family income, healthcare costs paid by insurance, and total healthcare costs) and time burden (missed school time due to illness or injury and the number of doctor visits) associated with 14 groups of children's chronic conditions. We used the two-part model to assess the effect of condition on financial burden and finite mixture/latent class model to analyze the time burden of caregiving. Controlling for the influences of other socio-demographic characteristics on caregiving burden, children with chronic conditions have higher financial and time burdens relative to caregiving burdens for healthy children. Levels of financial burden and burden sharing between families and insurance system also vary by type of condition. For example, children with pervasive developmental disorder or heart disease have a relatively low financial burden for families, while imposing a high cost on the insurance system. In contrast, vision difficulties are associated with a high financial burden for families relative to the costs borne by others. With respect to time burden, conditions such as cerebral palsy and heart disease impose a low time burden, while conditions such as pervasive developmental disorder are associated with a high time burden. This study demonstrates that differences exist in caregiving burden for children by type of chronic condition. Each condition has a unique profile of time and financial cost burden for families and the insurance system. These results have implications for policymakers and for families' savings and employment decisions.

PMID: 24951130 [PubMed - as supplied by publisher]

14. Pediatr Neurol. 2014 Jul;51(1):43-52. doi: 10.1016/j.pediatrneurol.2014.01.052. Epub 2014 Apr 5.

Development, reliability, and validity of the alberta perinatal stroke project parental outcome measure.

Bemister TB1, Brooks BL2, Kirton A3.

BACKGROUND: Perinatal stroke is a leading cause of cerebral palsy and lifelong disability, although parent and family outcomes have not yet been studied in this specific population. The Alberta Perinatal Stroke Project Parental Outcome Measure was developed as a 26-item questionnaire on the impact of perinatal stroke on parents and families. METHODS: The items were derived from expert opinion and scientific literature on issues salient to parents of children with perinatal stroke, including guilt and blame, which are not well captured in existing measures of family impact. Data were collected from 82 mothers and 28 fathers who completed the Parental Outcome Measure and related questionnaires (mean age, 39.5 years; mean child age, 7.4 years). Analyses examined the Parental Outcome Measure's internal consistency, test-retest reliability, validity, and factor structure. RESULTS: The Parental Outcome Measure demonstrated three unique theoretical constructs: Psychosocial Impact, Guilt, and Blame. The Parental Outcome Measure has excellent internal consistency (Cronbach a = 0.91) and very good test-retest reliability more than 2-5 weeks (r = 0.87). Regarding validity, the Parental Outcome Measure is sensitive to condition severity, accounts for additional variance in parent outcomes, and strongly correlates with measures of anxiety, depression, stress, quality of life, family functioning, and parent adjustment. CONCLUSIONS: The Parental Outcome Measure contributes to the literature as the first brief measure of family impact designed for parents of children with perinatal stroke.

PMID: 24938139 [PubMed - in process]

Prevention and Cure

15. Am J Perinatol. 2014 Jun 17. [Epub ahead of print]

The Association of Cord Serum Cytokines with Neurodevelopmental Outcomes.

Varner MW1, Marshall NE2, Rouse DJ3, Jablonski KA4, Leveno KJ5, Reddy UM6, Mercer BM7, Iams JD8, Wapner RJ9, Sorokin Y10, Thorp JM11, Malone FD12, Carpenter M13, O'Sullivan MJ14, Peaceman AM15, Hankins GD16, Dudley DJ17, Caritis SN18; for the Eunice Kennedy Shriver National Institute of Child Health Human Development Maternal-Fetal Medicine Units Network.

Objective: To test whether elevated umbilical cord serum inflammatory cytokine levels predicted subsequent cerebral palsy (CP) or neurodevelopmental delay (NDD). Study Design: Nested case-control analysis within a clinical trial of antenatal magnesium sulfate (MgSO4) before anticipated preterm birth (PTB) for prevention of CP, with evaluation of surviving children at the age of 2. NDD was defined as a Bayley psychomotor developmental index (PDI) and/or mental developmental index (MDI)<70. Controls, defined as surviving children without CP and with Bayley PDI and MDI=85, were matched by race and gestational age. Cord serum was analyzed for interleukin-8 (IL-8) interleukin-1 beta (IL-1ß), and tumor necrosis factor-a (TNF-a) levels. Elevated cytokine levels were defined as=75th percentile in placebo-exposed controls. Analyses compared case/control cytokine levels, adjusting for MgSO4 exposure, gestational age, race/ethnicity, and sociodemographic differences. Results: Logistic regression analysis with 339 cases and 276 controls showed that elevated IL-8 and IL-1ß were more common in cord blood serum from infants with subsequent low MDI as compared with controls. After adjusting for additional confounders, the significant differences were no longer evident. Cytokine levels (IL-8, IL-1ß, and TNF-a) were not elevated with CP or low PDI. Conclusion: Cord serum IL-8, IL-1ß, and TNF-a levels in preterm infants are not associated with subsequent CP or NDD.

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PMID: 24936937 [PubMed - as supplied by publisher]

16. Dev Med Child Neurol. 2014 Jun 20. doi: 10.1111/dmcn.12528. [Epub ahead of print]

Computer-based analysis of general movements reveals stereotypies predicting cerebral palsy.

Pierrat V.

PMID: 24948427 [PubMed - as supplied by publisher]

17. Early Hum Dev. 2014 Aug;90(8):387-92. doi: 10.1016/j.earlhumdev.2014.05.004. Epub 2014 Jun 5.

Jerky spontaneous movements at term age in preterm infants who later developed cerebral palsy.

Kanemaru N1, Watanabe H1, Kihara H2, Nakano H3, Nakamura T4, Nakano J5, Taga G6, Konishi Y7.

BACKGROUND: Assessment of spontaneous movements in infants has been a powerful predictor of cerebral palsy (CP). Recent advancements on computer-based video analysis can provide detailed information about the properties of spontaneous movements. AIMS: The aim of this study was to investigate the relationship between spontaneous movements of the 4 limbs at term age and the development of CP at 3years of age by using a computer-based video analysis system. STUDY DESIGN AND SUBJECTS: We analyzed video recordings of spontaneous movements at 36-44weeks postmenstrual age (PMA) for 145 preterm infants who were born preterm (22-36weeks PMA with birthweights of 460-1498g). Sixteen of the infants developed CP by 3years of age, while 129 developed normally. We compared 6 movement indices calculated from 2-dimensional trajectories of all limbs between the 2 groups. RESULTS: We found that the indices of jerkiness were higher in the CP group than in the normal group ($p<0.1$ for arms and $p<0.01$ for legs). No decline was observed in the average velocity and number of movement units in the CP group compared with to the normal group. CONCLUSIONS: Jerkiness of spontaneous movements at term age provides additional information for predicting CP in infants born preterm.

PMID: 24951073 [PubMed - in process]

18. Eur J Paediatr Neurol. 2014 Apr 15. pii: S1090-3798(14)00059-2. doi: 10.1016/j.ejpn.2014.04.007. [Epub ahead of print]

Clinical features of cerebral palsy in children with symptomatic congenital cytomegalovirus infection.

Dakovic I1, da Graça Andrada M2, Folha T3, Neubauer D4, Hollody K5, Honold M6, Horber V7, Duranovic V1, Bosnjak VM8.

BACKGROUND: Human cytomegalovirus is the most common cause of vertically transmitted viral infection, affecting around 1% of liveborns. Infection is symptomatic in nearly 10% of infected children who are at higher risk of development of severe neurological disorders, including cerebral palsy. AIMS: To study the clinical profile of children with cerebral palsy caused by symptomatic congenital cytomegalovirus infection in a multicenter study involving six countries from the Surveillance of Cerebral Palsy in Europe (SCPE) Network. METHODS: Data on 35 children (13 males, 22 females; mean age at last assessment 12y 6mo, age range 14y 6mo, min 4y, max 18y 6mo) on pre/peri/neonatal history and last clinical assessment were collected. Classification of cerebral palsy and associated impairments was performed according to SCPE criteria. RESULTS: The majority of children had bilateral spastic cerebral palsy, 85.7%, with a confidence interval (CI) [69.7-95.2], and 71.4% [CI 53.7-85.4] were unable to walk (GMFCS levels IV-V) while fine motor function was severely affected in 62.8% [CI 44.9-78.5] (BFMF levels IV and V). Most of the children with severe CP had severe associated impairments. 11.4% of children had severe visual and 42.8% severe hearing impairment, 77.1% [CI 59.9-89.6] suffered from epilepsy, also 77.1% had severe intellectual impairment, and speech was undeveloped in 71.4%. Female:male ratio was 1.69:1 and 80% of children were term born. CONCLUSIONS: Cerebral palsy following symptomatic congenital cytomegalovirus infection seems to be in most cases a severe condition and associated impairments are overrepresented.

PMID: 24931914 [PubMed - as supplied by publisher]

19. J Matern Fetal Neonatal Med. 2014 Jun 18:1-19. [Epub ahead of print]

Syngeneic Transplantation of Newborn Splenocytes in a Murine Model of Neonatal Ischemia-Reperfusion Brain Injury.

Wang F1, Shen Y, Tsuru E, Yamashita T, Baba N, Tsuda M, Maeda N, Sagara Y.

Objective: Neonatal hypoxic-ischemic encephalopathy (HIE) is caused by brain injury that occurs in a developing fetus or infant. Stem cell transplantation can reportedly induce functional recovery in animal models of HIE. Murine neonatal splenocytes are enriched with immature blood stem cells and are used for the investigation of murine models of syngeneic transplantation. The aim of this study was to investigate the therapeutic potential of newborn splenocytes in a murine model of neonatal ischemia-reperfusion brain injury. Methods: C57BL/6N mice (postnatal day 7) underwent right common carotid artery occlusion with an aneurysm clip. Following hypoxic exposure, reperfusion was achieved by unclamping the artery. Newborn splenocytes were transplanted intravenously at 3 weeks after injury. Results: The splenocytes transplanted group tended to show an improvement in behavioral tests, but it was not significantly different compared with the control groups. The transplanted cells were localized in various organs including injured brain tissue over 3 weeks. In the penumbra region of the brain, vascular endothelial growth factor (VEGF) expression was upregulated after transplantation. conclusions: these results showed that syngeneic transplantation of newborn splenocytes achieved the long-term survival of the grafts and exerted influence the microenvironment in the injured brains of mice.

PMID: 24939627 [PubMed - as supplied by publisher]

20. Obstet Gynecol. 2014 Apr;123(4):896-901. doi: 10.1097/01.AOG.0000445580.65983.d2.

Executive summary: Neonatal encephalopathy and neurologic outcome, second edition. Report of the American College of Obstetricians and Gynecologists' Task Force on Neonatal Encephalopathy.

[No authors listed]

PMID: 24785633 [PubMed - indexed for MEDLINE]

21. Semin Pediatr Surg. 2014 Apr;23(2):76-82. doi: 10.1053/j.sempedsurg.2014.03.005. Epub 2014 Mar 15.

Persistent hyperinsulinaemic hypoglycaemia in infancy.

Shah P1, Demirbilek H1, Hussain K2.

Persistent hyperinsulinaemic hypoglycaemia in infancy (PHHI) is a heterogeneous condition characterised by unregulated insulin secretion in response to a low blood glucose level. It is the most common cause of severe and persistent hypoglycaemia in neonates. It is extremely important to recognise this condition early and institute appropriate management to prevent significant brain injury leading to complications like epilepsy, cerebral palsy and neurological impairment. Histologically, PHHI is divided mainly into three types-diffuse, focal and atypical disease. Fluorine-18-l-3,4-dihydroxyphenylalanine positron emission tomography (18F-DOPA-PET/CT) scan allows differentiation between diffuse and focal diseases. The diffuse form is inherited in an autosomal recessive (or dominant) manner whereas the focal form is sporadic in inheritance and is localised to a small region of the pancreas. The molecular basis of PHHI involves defects in key genes (ABCC8, KCNJ11, GCK, SLC16A1, HADH, UCP2, HNF4A and GLUD1) that regulate insulin secretion. Focal lesions are cured by lesionectomy whereas diffuse disease (unresponsive to medical therapy) will require a near-total pancreatectomy with a risk of developing diabetes mellitus and pancreatic exocrine insufficiency. Open surgery is the traditional approach to pancreatic resection. However, recent advances in laparoscopic surgery have led to laparoscopic near-total pancreatectomy for diffuse lesions and laparoscopic distal pancreatectomy for focal lesions distal to the head of the pancreas.

PMID: 24931352 [PubMed - in process]