Cerebral Palsy ALLIANCE

CP Research News

Monday 13 June 2011

Interventions

1. Child Care Health Dev. 2011 Jun 8. doi: 10.1111/j.1365-2214.2011.01240.x. [Epub ahead of print]

A comparison of doctors', parents' and children's reports of health states and health-related quality of life in children with chronic conditions.

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Background: Health-related quality of life is an important outcome. Self-report is the gold standard, but in the paediatric setting we often rely on proxy reporting. Our understanding of the differences between self- and proxy reports and the factors that influence them is limited. These differences can impact on treatment choices and the patient-doctor relationship. Objective: To evaluate differences between children's, parents' and doctors' perceptions of health states and health-related quality of life in children with chronic illness and explore factors which explain these differences. Methods: Consecutive families attending eligible clinics at a tertiary paediatric centre were invited to complete the Health Utilities Index (HUI) 23 questionnaire. Percentage agreement and kappas were calculated as a measure of the agreement between pairs. Chi-squared tests or Fisher's exact test, if appropriate, were performed to determine if there was an association between level of agreement and participant variables. Results: Data were collected for 130 parent-doctor pairs, 59 child-parent pairs and 59 child-doctor pairs. Overall health-related quality of life scores did not differ between responders, but there was poorer agreement for subjective domains. Doctor-child agreement was lower than parent-child agreement. Children with a diagnosis of cerebral palsy or chronic neurological condition were more likely to have lower inter-rater agreement for both subjective and objective domains. On the HUI2, agreement was lower for parent-child pairs when the father was the respondent. For child-doctor pairs, an increased frequency of patient-doctor visits and doctors' seniority were predictors of poorer agreement on the HUI3 and HUI2 respectively. Conclusions: We identified factors associated with level of agreement for self- and proxy reporting on the HUI23. Parent-child agreement was higher than doctor-child agreement. Patients with significant pain or emotional distress and patients with a diagnosis of severe cerebral palsy or chronic neurological conditions were more susceptible to under-reporting of subjective aspects of well-being by doctors and parents and may benefit from formal assessment of health-related quality of life in the clinical setting.

PMID: 21651605 [PubMed - as supplied by publisher]

2. Eur J Phys Rehabil Med. 2011 Jun 8. [Epub ahead of print]

Core elements of physiotherapy in cerebral palsy children: proposal for a trial checklist.

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BACKGROUND: Currently international literature describes physiotherapy in cerebral palsy (CP) children only in generic terms (traditional / standard / background / routine). AIM: The aim of this study is to create a checklist capable of describing the different modalities employed in physiotherapeutic treatment by means of a non-bias, common, universal, standardised language. DESIGN: A preliminary checklist was outlined by a group of physiotherapists specialised in child rehabilitation. SETTING: For its experimentation, several physiotherapists from various paediatric units from all over Italy with different methodological approaches and backgrounds, were involved. METHOD: Using the interpretative model, proposed by Ferrari et al., and through collective analysis and discussion of clinical videos, the core elements were progressively selected and codified. A reliability study was then carried out by eight expert physiotherapists using an inter-rate agreement model. RESULT: The checklist analyses therapeutic proposals of CP rehabilitation through the description of settings, exercises and facilitations and consists of items and variables which codify all possible physiotherapeutic interventions. It is accompanied by written explanations, demonstrative videos, caregiver interviews and descriptions of applied environmental adaptations. All checklist items obtained a high level of agreement (according to Cohen's kappa coefficient), revealing that the checklist is clearly and easily interpretable. CONCLUSION: The checklist should facilitate interaction and communication between specialists and families, and lead to comparable research studies and scientific advances. CLINICAL REHABILITATION IMPACT: The main value is to be able to correlate therapeutic results with core elements of adopted physiotherapy.

PMID: 21654617 [PubMed - as supplied by publisher]

3. Coll Antropol. 2011 Jan;35 Suppl 1:57-63.

Effects of vibrotactile stimulation on the control of muscle tone and movement facilitation in children with cerebral injury.

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Afferent signals from the muscle's proprioceptors play important role in the control of muscle tone and in the facilitation of movements. Peripheral afferent pathway enables the restoration of connections with supraspinal structures and so includes mechanism of synaptic inhibition in the performance of normal movement. Different sensory stimuli, as vibrotactile stimulation, excite muscle's proprioceptors which then send sensorimotor information via spinal cord. In this way afferent signals promote cortical control and modulation of movements. The goal of this study is to evaluate the effects of vibrotactile stimulation on the spasticity and motor performance in children with cerebral injury. Subjects included in this study were 13 children who were developing the classification of spastic cerebral palsy. For all children perinatal brain damage was documented by medical reports and neonatal brain ultrasound scan. At the mean age of 3 years and 6 months subject underwent the assessment of motor development by Gross Motor Function Measurement (GMFM-88). Gross Motor Classification System (GMFCS) has been used to classify functions of lower extremities. Therapeutic intervention was conducted once a week during 3 months. All subjects were stimulated with vibrotactile stimuli of 40Hz in duration of 20 minutes in order to reduce spasticity. After the ending of the treatment subjects underwent second assessment of motor performance and the classification of lower extremities functions. The results have shown that there was a significant improvement in motor performance, what has been seen in the facilitation of rotations, better postural trunk stability and head control and in greater selectivity of movements. Further randomized, control trial investigations with bigger sample and included spasm scale are needed to gain better insight in the role of vibrotactile stimulation in the facilitation of normal movements.

PMID: 21648312 [PubMed - in process]

4. Folia Med (Plovdiv). 2011 Jan-Mar;53(1):40-6.

Disability-related injuries in athletes with disabilities.

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OBJECTIVES: Athletes with disabilities are highly skilled. Sports-related injuries and disorders interfere with their efforts. Several aspects of these injuries have been studied in previous studies. The aim of this study was to correlate the types of injuries with the disability group in athletes with physical disabilities. METHODS: One hundred and thirty nine elite athletes with physical disabilities completed a questionnaire about sports-related injuries that resulted in at least one day off from training or competition. RESULTS: All disability groups show soft tissue injuries in high percentages. Cerebral palsy (CP) athletes reported soft tissue injuries ($P < 0.01$) and lacerations ($P < 0.001$) in higher percentage than Other Disabled Athletes (ODA) and Spinal Cord Injured (SCI) athletes. Spinal cord injured athletes sustained fractures ($P < 0.05$) and blisters ($P < 0.05$) in higher percentages than the other groups. No differences were found between the studied groups for contusions, low back pain, ruptures, thermoregulation disorders, urinary tract infections, pressure sores and pneumonias. CONCLUSION: CP athletes sustained soft tissue injuries and lacerations more than other disability groups did because moving and walking patterns of this population add risk factors for such injuries. Fractures and blisters occur more frequently to SCI athletes because they participate in higher percentage in wheelchair basketball which is high risky sport.

PMID: 21644404 [PubMed - in process]

5. Gait Posture. 2011 Jun 2. [Epub ahead of print]

The Arm Profile Score: A new summary index to assess upper limb movement pathology.

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Although three-dimensional movement analysis is being increasingly used to evaluate upper limb (UL) movements, information on how to interpret the complex data is still missing. This paper introduces a new summary index, the "Arm Profile Score" (APS), to evaluate the severity of UL movement pathology based on kinematic data, similar to the "Gait Profile Score". The APS is calculated from the root mean square (RMS) difference between kinematic data of the individual child with UL movement deficits and average data from typically developing children. The APS can be decomposed into 13 Arm Variable Scores (AVS), representing the different joint angles. The APS, together with the AVSs form the "Arm Movement Analysis Profile" (A-MAP). Face and construct validity were established for eight UL tasks in a group of 20 children with hemiplegic cerebral palsy (HCP). Intra-session variability was low for the different tasks, with median inter-quartile ranges below 2°. Correlation analysis showed few significant correlations between the individual AVSs and between the AVS and APS, implying that the A-MAP provides considerably more information compared to the APS only. The APS also showed good correlations with the House classification, and with measures of muscle tone, manual muscle strength and grip strength. This study provides a sound base to use the APS to evaluate UL movement pathology in children with HCP. Further study will need to confirm its value as an outcome measurement.

PMID: 21641224 [PubMed - as supplied by publisher]

6. J Biomech. 2011 Jun 6. [Epub ahead of print]

An upper extremity inverse dynamics model for pediatric Lofstrand crutch-assisted gait.

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The objective of this study was to develop an instrumented Lofstrand crutch system, which quantifies three-dimensional (3-D) upper extremity (UE) kinematics and kinetics using an inverse dynamics model. The model describes the dynamics of the shoulders, elbows, wrists, and crutches and is compliant with the International Society of Biomechanics (ISB) recommended standards. A custom designed Lofstrand crutch system with four, six-degree-of-freedom force transducers was implemented with the inverse dynamics model to obtain triaxial UE joint reaction forces and moments. The crutch system was validated statically and dynamically for accuracy of computing joint reaction forces and moments during gait. The root mean square (RMS) error of the system ranged from 0.84 to 5.20%. The system was demonstrated in children with diplegic cerebral palsy (CP), incomplete spinal cord injury (SCI), and type I osteogenesis imperfecta (OI). The greatest joint reaction forces were observed in the posterior direction of the wrist, while shoulder flexion moments were the greatest joint reaction moments. The subject with CP showed the highest forces and the subject with SCI demonstrated the highest moments. Dynamic quantification may help to elucidate UE joint demands in regard to pain and pathology in long-term assistive device users.

PMID: 21652035 [PubMed - as supplied by publisher]

7. J Pediatr Orthop. 2011 Jul-Aug;31(5):541-7.

Distal rectus femoris intramuscular lengthening for the correction of stiff-knee gait in children with cerebral palsy.

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PURPOSE: To evaluate the effects of rectus femoris intramuscular lengthening, a novel procedure to treat stiff-knee gait in ambulatory patients with cerebral palsy, using preoperative and postoperative 3-dimensional gait analysis. METHODS: This study was a retrospective data review of ambulatory patients with a diagnosis of cerebral palsy who had undergone rectus femoris intramuscular lengthening. The indications for rectus femoris intramuscular lengthening were identical to those of rectus femoris transfer. Patients must have had preoperative and postoperative gait analyses at our institution. Three-dimensional kinematic and kinetic data was collected using a VICON 512 motion measurement system (VICON Motion Systems, Inc, Lake Forest, CA) after standard techniques. A representative trial was selected for analysis both preoperatively and postoperatively. Preoperative to postoperative differences were measured using a Student t test ($P<0.05$). Selected sagittal plane kinematic and kinetic parameters were analyzed. RESULTS: A total of 42 patients (69 sides) treated between 1991 and 2008 with preoperative and postoperative gait analyses after rectus femoris intramuscular lengthening were analyzed. The mean age at surgery was 8.5 years (SD ±2.9) and the mean time after surgery at postoperative gait analysis was 17.9 months (range, 7 to 53 mo). There were 26 male and 16 female patients. Compared with preoperative values, postoperative gait analysis revealed patients to have earlier timing of peak knee flexion in swing (82%→80% of gait cycle, $P=0.001$), less crouch (average knee flexion in stance 26→20 degrees, $P=0.002$), and maintenance (no statistically significant difference) of peak knee flexion. A cohort of patients also showed maintenance of knee function at intermediate-term follow-up (mean 44.6 mo). Patients who underwent soft-tissue surgery only benefited more from the procedure than those who also underwent bony surgery. CONCLUSIONS: Rectus femoris intramuscular lengthening may offer an alternative procedure for the treatment of stiff-knee gait in ambulatory patients with cerebral palsy. When comparing preoperative and postoperative gait analysis data, our cohort showed maintenance of peak knee flexion in swing, earlier timing of peak knee flexion in swing, and less crouch. Patients who underwent soft-tissue surgery only showed the most benefit. LEVEL OF EVIDENCE: Level IV.

PMID: 21654463 [PubMed - in process]

8. Res Dev Disabil. 2011 Jun 4. [Epub ahead of print]

Control of angular momentum during walking in children with cerebral palsy.

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Children with hemiparetic Cerebral Palsy (CP) walk with marked asymmetries. For instance, we have recently shown that they have less arm swing on the affected side, and more arm swing at the unaffected side. Such an increase in arm swing at the unaffected side may be aimed at controlling total body angular momentum about the vertical axis, although it was never investigated in this respect. In the current study, we thus investigated if participants with hemiparetic CP control angular momentum by compensatory movements of the unaffected arm. We measured gait kinematics of 11 CP children, and 24 age matched typically developing (TD) children, walking at both self-selected and fast walking speeds, and calculated angular momenta. We found that children with hemiparetic CP did not have a reduced angular momentum of the affected arm. However, they showed substantial increases in angular momentum generated by the legs, which were compensated by increased angular momentum of the unaffected arm. As a result, there were no differences in total body angular momentum between TD and CP children. Moreover, walking speed had no effect on total body angular momentum in both groups. These findings support the idea that angular momentum during walking is a controlled variable, even in children with hemiplegic CP.

PMID: 21641770 [PubMed - as supplied by publisher]

9. J Pediatr Orthop. 2011 Jul-Aug;31(5):557-63.

Talonavicular arthrodesis for the treatment of neurological flat foot deformity in pediatric patients: clinical and radiographic evaluation of 29 feet.

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BACKGROUND: Patients with cerebral palsy, syndromes, myopathies, and other forms of neurological impairment can develop planovalgus foot deformity of variable degrees of severity. Several techniques have already been described to resolve the deformity with variable results. Talonavicular arthrodesis is a well-known technique in adult patients, but to our knowledge, it has not been described in children with neurological impairment. METHODS: We performed a retrospective chart and radiographic review of 18 neurological patients (10 boys, 8 girls) with a mean age of 11.3±2.6 years (range, 7 to 19 y) who underwent talonavicular arthrodesis for flat foot deformity between 1998 and 2009, at our center. RESULTS: Of a total of 29 feet, talonavicular arthrodesis was judged satisfactory in 28 feet, whereas 1 had unsatisfactory results according to the Yoo clinical outcome scoring scale. Subjective observations reported that 3 feet from 2 patients were painful preoperatively and none after last follow-up. Functionally, 2 of 13 patients were able to stop using braces after surgery. The significant improvement achieved postoperatively in radiographic measurement angles was maintained at last follow-up without any loss of angle correction. CONCLUSIONS: Talonavicular arthrodesis seems to achieve a reliable hind foot fixation in flat foot in patients with neurological impairment. LEVEL OF EVIDENCE IV: Case series.

PMID: 21654466 [PubMed - in process]

10. J Pediatr Orthop. 2011 Jul-Aug;31(5):534-40.

Evaluation of conventional selection criteria for psoas lengthening for individuals with cerebral palsy: a retrospective, case-controlled study.

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BACKGROUND: Psoas lengthening surgery has been advocated to improve hip function in patients with spastic cerebral palsy (CP); however, no uniform or standardized selection criteria have been agreed upon. Our study evaluated a proposed algorithm for selecting patients for psoas surgery to be included as part of a single-event multilevel surgery (SEMLS).
METHODS: A retrospective, case-controlled study was performed on children with CP who underwent a SEMLS and met 2 of 3 of the following proposed selection criteria after gait analysis: (1) maximum hip extension no >8 degrees of flexion, (2) maximum pelvic tilt >24 degrees, and (3) pelvic tilt range of motion >8 degrees. One group had a psoas lengthening surgery as part of their SEMLS (psoas group) and 1 group did not (control group). Among other variables, overall kinematic gait pathology, as measured by the Gait Deviation Index (GDI), Pelvis and Hip kinematic gait pathology, as measured by the Pelvis and Hip Deviation Index (PHiDI), and Gross Motor Function Classification System (GMFCS) levels were compared.
RESULTS: Eighty-seven sides met 2 of 3 of the proposed selection criteria; 32 in the psoas group and 55 in the control group. Both groups showed improvement in function after SEMLS. There was a significantly greater improvement in GDI for the psoas group in patients with GMFCS levels 3 and 4 (+12.9 vs. +7.7, P=0.02). Odds ratio for "poor outcomes" in PHiDI for the control group compared with the psoas group was 5.1 (95% CI, 1.37-18.95), which was significant. CONCLUSIONS: Certain patients that met the proposed selection criteria did functionally better if psoas surgery was included as part of their SEMLS, specifically those that were classified as GMFCS levels 3 and 4. The risk of no improvement in hip function after SEMLS was greater if the parameters were met and psoas lengthening was not performed. The differences between the groups were modest by clinical standards, leaving open the possibility that other selection criteria may better differentiate those that would do well and those that would do poorly after psoas surgery. LEVEL OF EVIDENCE: Retrospective, case-controlled study. Level III.

PMID: 21654462 [PubMed - in process]

11. Sex Disabil. 2011 Jun;29(2):119-128. Epub 2010 Oct 12.

Sexuality of Young Adults with Cerebral Palsy: Experienced Limitations and Needs.

Wiegerink D, Roebroeck M, Bender J, Stam H, Cohen-Kettenis P; Transition Research Group South West Netherlands.

Objective of this study is to describe the problems young adults with Cerebral Palsy (CP) experience in the various stages of the sexual response cycle, and the physical and emotional obstacles they experience with sexuality. In this prospective cohort study 74 young adults (46 men; 28 women) with CP and average intelligence participated, aged 20-24 years. Twenty percent of these young adults with CP experienced anorgasmia, 80% reported physical problems with sex related to CP and 45% emotional inhibition to initiate sexual contact. In 90% of the participants, sexuality had not been discussed during the rehabilitation treatment. Many adolescents reported wanting information about the impact of CP on sexuality and reproduction (35%), about interventions (26%), tools and medicines (16%) and about problems with their partner (14%). Young adults with CP can experience various problems or challenges with sexuality. For preventing sexual difficulties and treating sexual problems, health care professionals need to proactively take the initiative to inform young people with CP about sexuality.

PMID: 21660090 [PubMed]

12. Panminerva Med. 2011 Jun;53(2):129-36.

Animal-assisted interventions in internal and rehabilitation medicine: a review of the recent literature.

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While conventional wisdom has always affirmed the value of animals in promoting human well-being, only recently has their therapeutic role in medicine become the focus of dedicated research. Therapeutic modalities that use animals as a tool for improving the physical, emotional, cognitive and/or social functioning of humans are called animal-assisted interventions (AAI), and are classified into: animal-assisted activities (AAA); animal-assisted therapy (AAT); and service animal programs (SAP). The aim of this review is to analyze the papers published between 2001 and 2010 in the most influential medical journals dealing with AAI, and discuss their findings in the light of what may be of interest for internal medicine and rehabilitation. A total of 35 articles met the strict inclusion criteria for this review: 18 papers dealing with AAA, 8 with AAT, and 9 with SAP. The therapeutic outcomes associated with AAA are: enhancement of socialization; reduction of stress, anxiety and loneliness; improvement in mood and general well-being; and development of leisure/recreation skills. Regarding AAT, horses are often used as a complementary strategy to facilitate the normalization of muscle tone and improve motor skills in children with cerebral palsy and persons with lower limb spasticity. Finally, most SAP utilize dogs, that assist people with various disabilities in performing everyday activities, thus reducing their dependence on other persons. Further studies are needed to better define the fields and programs for the therapeutic use of animals and to increase their utilization in medicine, as a promising, complementary and natural means to improve both functional autonomy and quality of life.

PMID: 21659977 [PubMed - in process]

13. J Dev Behav Pediatr. 2011 Jun 6. [Epub ahead of print]

Cerebral Palsy Grown Up.

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PMID: 21654334 [PubMed - as supplied by publisher]

Epidemiology / Aetiology / Diagnosis & Early Treatment

14. J Obstet Gynaecol Can. 2011 May;33(5):516-29.

Magnesium sulphate for fetal neuroprotection.

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Objective: To provide guidelines for the use of antenatal magnesium sulphate (MgSO4) for fetal neuroprotection of the preterm infant. Options: Antenatal MgSO4 administration should be considered for fetal neuroprotection when women present at ≤ 31+6 weeks with imminent preterm birth, defined as a high likelihood of birth because of active labour with cervical dilatation ≥ 4 cm, with or without preterm pre-labour rupture of membranes, and/or planned preterm birth for fetal or maternal indications. There are no other known fetal neuroprotective agents. Outcomes: The outcomes measured are the incidence of cerebral palsy (CP) and neonatal death. Evidence: Published literature was retrieved through searches of PubMed or Medline, CINAHL, and the Cochrane Library in May 2010, using appropriate controlled vocabulary and key words (magnesium sulphate, cerebral palsy, preterm birth). Results were

restricted to systematic reviews, randomized controlled trials, and relevant observational studies. There were no date or language restrictions. Searches were updated on a regular basis and incorporated in the guideline to August 2010. Grey (unpublished) literature was identified through searching the websites of health technology assessment and health technology assessment-related agencies, clinical practice guideline collections, clinical trial registries, and national and international medical specialty societies. Values: The quality of evidence was rated using the criteria described in the Report of the Canadian Task Force on Preventive Health Care (Table 1). Benefits, harms, and costs: Antenatal magnesium sulphate for fetal neuroprotection reduces the risk of "death or CP" (RR 0.85; 95% CI 0.74 to 0.98; 4 trials, 4446 infants), "death or moderate-severe CP" (RR 0.85; 95% CI 0.73 to 0.99; 3 trials, 4250 infants), "any CP" (RR 0.71; 95% CI 0.55 to 0.91; 4, trials, 4446 infants), "moderate-to-severe CP" (RR 0.60; 95% CI 0.43 to 0.84; 3 trials, 4250 infants), and "substantial gross motor dysfunction" (inability to walk without assistance) (RR 0.60; 95% CI 0.43 to 0.83; 3 trials, 4287 women) at 2 years of age. Results were consistent between trials and across the meta-analyses. There is no anticipated significant increase in health care-related costs, because women eligible to receive antenatal MgSO4 will be judged to have imminent preterm birth. Validation: Australian National Clinical Practice Guidelines were published in March 2010 by the Antenatal Magnesium Sulphate for Neuroprotection Guideline Development Panel. Antenatal MgSO4 was recommended for fetal neuroprotection in the same dosage as recommended in these guidelines. However, MgSO4 was recommended only at < 30 weeks' gestation, based on 2 considerations. First, no one gestational age subgroup was considered to show a clear benefit. Second, in the face of uncertainty, the committee felt it was prudent to limit the impact of their clinical practice guidelines on re allocation. Also in March 2010, the American College of Obstetricians and Gynecologists issued a Committee Opinion on MgSO4 for fetal neuroprotection. It stated that, "the available evidence suggests that magnesium sulphate given before anticipated early preterm birth reduces the risk of cerebral palsy in surviving infants." No official opinion was given on a gestational age cut-off, but it was recommended that physicians develop specific guidelines around the issues of inclusion criteria, dosage, concurrent tocolysis, and monitoring in accordance with one of the larger trials. Sponsors: Canadian Institutes of Health Research (CIHR). Summary Statement 1. "Imminent preterm birth" is defined as a high likelihood of birth due to one or both of the following conditions (II-2): Active labour with ≥ 4 cm of cervical dilation, with or without PPROM. Planned preterm birth for fetal or maternal indications. Recommendations 1. For women with imminent preterm birth (≤ 31+6 weeks), antenatal magnesium sulphate administration should be considered for fetal neuroprotection. (I-A) 2. Although there is controversy about upper gestational age, antenatal magnesium sulphate for fetal neuroprotection should be considered from viability to ≤ 31+6 weeks. (II-1B) 3. If antenatal magnesium sulphate has been started for fetal neuroprotection, tocolysis should be discontinued. (III-A) 4. Magnesium sulphate should be discontinued if delivery is no longer imminent or a maximum of 24 hours of therapy has been administered. (II-2B) 5. For women with imminent preterm birth, antenatal magnesium sulphate for fetal neuroprotection should be administered as a 4g IV loading dose, over 30 minutes, followed by a 1g/hr maintenance infusion until birth. (II-2B) 6. For planned preterm birth for fetal or maternal indications, magnesium sulphate should be started, ideally within 4 hours before birth, as a 4g IV loading dose, over 30 minutes, followed by a 1g/hr maintenance infusion until birth. (II-2B) 7. There is insufficient evidence that a repeat course of antenatal magnesium sulphate for fetal neuroprotection should be administered. (III-L) 8. Delivery should not be delayed in order to administer antenatal magnesium sulphate for fetal neuroprotection if there are maternal and/or fetal indications for emergency delivery. (III-E) 9. When magnesium sulphate is given for fetal neuroprotection, maternity care providers should use existing protocols to monitor women who are receiving magnesium sulphate for preeclampsia/eclampsia. (III-A) 10. Indications for fetal heart rate monitoring in women receiving antenatal magnesium sulphate for neuroprotection should follow the fetal surveillance recommendations of the SOGC 2007 Fetal Health Surveillance: Antepartum and Intrapartum Consensus Guideline. (III-A) 11. Since magnesium sulphate has the potential to alter the neonate's neurological evaluation, causing hypotonia or apnea, health care providers caring for the neonate should have an increased awareness of this effect. (III-C).

PMID: 21639972 [PubMed - in process]

15. Arch Dis Child Fetal Neonatal Ed. 2011 Jun 9. [Epub ahead of print]

Prognostic value of EEG in very premature newborns.

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Objective: To evaluate the prognostic value of EEG regarding the psychomotor outcomes of very premature newborns. Methods: 76 premature infants <30 weeks gestation were enrolled between January 2001 and August 2004. They were examined at 4 and 9 months corrected ages, and at 18 months, 3-4 years and 5-6 years. EEGs per-

formed in the neonatal period were analysed by two neurologists blind to the child's outcome. Results: The mean follow-up was 5.6 years. 25 infants had normal neurological development and all EEGs were normal for 22 of these. 36 others had developmental disabilities (7 motor sequelae and 29 delayed psychomotor development). Of 187 EEGs, 43 were dysmature, 13 disorganised, 2 displayed electrical seizures without clinical manifestations and 15 showed other abnormal features. Dysmaturity was the predominant EEG pattern in newborns with severe or moderate sequelae and was persistent on several EEGs in 12 of these. In contrast, only three infants with normal development had a dysmature pattern on one EEG. All infants with a disorganised pattern had cognitive sequelae, and two had cerebral palsy. The sensitivity of EEG regarding psychomotor outcome was 83.3%, the specificity was 88% and the positive predictive value was 90.9%. Conclusion:s Very preterm neonates remain at high risk of neurological sequelae and EEG is a sensitive method for assessing neuromotor and cognitive prognosis. A dysmature pattern was the predominant EEG characteristic in infants who developed severe or moderate impairment. Early postnatal tracing is useful but additional recordings are generally necessary to detect high-risk newborns.

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16. Coll Antropol. 2011 Jan;35 Suppl 1:229-34.

Malformations of cortical development in children with congenital cytomegalovirus infection - A study of nine children with proven congenital cytomegalovirus infection.

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Congenital cytomegalovirus (CMV) infection is the most common vertically transmitted disease with the rate of the infection ranging from 0.2 to 2.4% in newborn infants. Congenital CMV infection causes multiorgan affection, but the most severe and permanent sequelae are those affecting central nervous system such as mental retardation, cerebral palsy, sensorineural hearing loss, chorioretinitis and seizures as a result of direct interference of the virus with neurogenesis. The time of acquiring infection is strongly connected to the level of child's disability. Infection in early pregnancy results in severe neurological sequelae, while later infection has less prominent signs. Radiological findings show connection between onset of infection and brain imaging, from lissencephaly, pachygyria, polymicrogyria, schizencephaly, calcification, cerebellar hypoplasia and/or hypoplasia/agenesis of corpus callosum as a result of an early infection, to white matter abnormalities including disturbed myelination as a result of a late infection. We present nine patients with proven congenital CMV infection and malformations of cortical development and their computed tomography/magnetic resonance (CT/MRI) findings along with clinical assessments. According to CT/MRI results we assume that two of our children with lissencephaly had an early onset of infection. The other seven with less severe cortical dysplasia in form of pachy/polymicrogyria were probably infected later Cerebellar hypoplasia and/or calcifications in our patients also confirm an early onset of infection. Developmental outcome in all of our children was poor: moderate to severe psychomotor retardation has been diagnosed in all children; five of them have developed cerebral palsy (four have bilateral spastic and one dyskinetic) and one is estimated to have minor motor dysfunction. Seven out of nine developed epilepsy, chorioretinitis was found in three of them and sensorineural deafness in two of them. All of our children, except one, were presented by symptomatic infection, yet only four of them were recognized at birth. Therefore, congenital CMV infection should be considered as one of the reasons for childhood disability more often.

PMID: 21648339 [PubMed - in process]

17. Dev Neurosci. 2011 Jun 10. [Epub ahead of print]

Deleterious Effect of Hyperoxia at Birth on White Matter Damage in the Newborn Rat.

Vottier G, Pham H, Pansiot J, Biran V, Gressens P, Charriaut-Marlangue C, Baud O.

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White matter damage (WMD) remains the leading cause of cerebral palsy in children born prematurely. The release

of an excessive amount of reactive oxygen species is recognized as a risk factor for WMD. We hypothesize that free radical injury during reoxygenation at birth may be harmful to the immature white matter and may underlie, at least in part, the pathogenesis of WMD. We tested this hypothesis in rat pups delivered from normoxic pregnant rats, and by investigating an animal model based on protracted antenatal hypoxia in the pregnant rat and mimicking the main features of human WMD in rat pups. From embryonic day (E)5 to E21, the pregnant rats were placed in a chamber supplied with a gas mixture that either induced hypoxia (FiO(2) = 10%) or maintained normoxia (FiO(2) = 21%). On E21, the dams were removed from the chamber and housed under either normoxia (FiO(2) = 21%), hyperoxia (FiO(2) = 60%) or slowly reoxygenated (FiO(2) from 15% at E21 to 21% at postnatal day 7). Postnatal hyperoxia was associated with a significantly increased density of activated microglial cells (+105%) and TUNEL (terminal deoxynucleotidyl transferase-mediated deoxyuridine triphosphate nick end labeling)-positive cells (+85%) within the developing white matter. Myelin content (-31%) and mature oligodendrocyte density (-37%) in the normal developing white matter were significantly decreased by postnatal hyperoxia. Postnatal hyperoxia significantly potentiated the myelination delay and oligodendroglial dysmaturation induced by antenatal hypoxia. In contrast, progressive reoxygenation at birth did not induce any change in white matter inflammation, myelination and cell death as compared with normoxic controls, and prevented most of the WMD observed following antenatal hypoxia. This study demonstrates a deleterious effect of hyperoxia at birth on the developing white matter in normal rat pups. Postnatal hyperoxia worsened the WMD induced by antenatal hypoxia. Hyperoxia at birth should be avoided in preterm infants at risk of WMD.

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18. Dev Neurosci. 2011 Jun 10. [Epub ahead of print]

Neuronal Nitric Oxide Synthase Inhibition Prevents Cerebral Palsy following Hypoxia-Ischemia in Fetal Rabbits: Comparison between JI-8 and 7-Nitroindazole.

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Cerebral palsy and death are serious consequences of perinatal hypoxia-ischemia (HI). Important concepts can now be tested using an animal model of cerebral palsy. We have previously shown that reactive oxygen and nitrogen species are produced in antenatal HI. A novel class of neuronal nitric oxide synthase (nNOS) inhibitors have been designed, and they ameliorate postnatal motor deficits when administered prior to the hypoxic-ischemic insult. This study asks how the new class of inhibitors, using JI-8 (K(i) for nNOS: 0.014 μM) as a representative, compare with the frequently used nNOS inhibitor 7-nitroindazole (7-NI; K(i): 0.09 ± 0.024 μM). A theoretical dose equivalent to 75 K(i) of JI-8 or equimolar 7-NI was administered to pregnant rabbit dams 30 min prior to and immediately after 40 min of uterine ischemia at 22 days gestation (70% term). JI-8 treatment resulted in a significant decrease in NOS activity (39%) in fetal brain homogenates acutely after HI, without affecting maternal blood pressure and heart rate. JI-8 treatment resulted in 33 normal kits, 2 moderately and 13 severely affected kits and 5 stillbirths, compared with 8 normal, 3 moderately affected and 5 severely affected kits and 10 stillbirths in the 7-NI group. In terms of neurobehavioral outcome, 7-NI was not different from saline treatment, while JI-8 was superior to saline and 7-NI in its protective effect ($p < 0.05$). In the surviving kits, JI-8 significantly improved the locomotion score over both saline and 7-NI scores. JI-8 was also significantly superior to saline in preserving smell, muscle tone and righting reflex function, but 7-NI did not show significant improvement. Furthermore, a 100-fold increase in the dose (15.75 μmol/kg) of 7-NI significantly decreased systolic blood pressure in the dam, while JI-8 did not. The new class of inhibitors such as JI-8 shows promise in the prevention of cerebral palsy and is superior to the previously more commonly used nNOS inhibitor.

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19. J Pediatr Orthop B. 2011 Jul;20(4):212-21.

Soft tissue release of the spastic hip by psoas-rectus transfer and adductor tenotomy for long-term functional improvement and prevention of hip dislocation.

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The purpose of this study was to assess the long-term development of children with cerebral palsy treated with soft tissue releases of the hip and, if necessary, also of the hamstrings and the Achilles tendon. The follow-up had to consider the functional status and the hip centration. Seventy-one patients (46 with tetrapareses, 24 with dipareses, and one with triparesis) who underwent soft tissue releases of the hip by the so-called psoas-rectus transfer at an average age of 7 years were assessed preoperatively, after 1 year and at an average age of 19 years. Functional status and the radiological lapse were assigned. The functional status of the patients significantly improved ($P<0.001$) after surgery. The number of patients who were able to walk increased from 49.3 to 80.3%. The migration percentage decreased from 26.6 to 17.3%. For medium-to-severe functional deficits, a clear gain of function and a safe prevention of spastic hip luxation were achieved.

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20. Nat Biotechnol. 2011 Feb;29(2):95-7.

ReNeuron and StemCells get green light for neural stem cell trials.

Mack GS.

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21. Paediatr Perinat Epidemiol. 2011 Jul;25(4):366-76. doi: 10.1111/j.1365-3016.2010.01187.x. Epub 2011 Mar 7.

The Modified Checklist for Autism in Toddlers in extremely low gestational age newborns: individual items associated with motor, cognitive, vision and hearing limitations.

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The Modified Checklist for Autism in Toddlers (M-CHAT) has yielded elevated rates of screening failure for children born preterm or with low birthweight. We extended these findings with a detailed examination of M-CHAT items in a large sample of children born at extremely low gestational age. The sample was grouped according to children's current limitations and degree of impairment. The aim was to better understand how disabilities might influence M-CHAT scores. Fourteen participating institutions of the Extremely Low Gestational Age Newborns (ELGAN) Study prospectively collected information about 1086 infants who were born before the 28th week of gestation and had an assessment at age 24-months. The 24-month visit included a neurological assessment, the Bayley Scales of Infant Development, Second edition (BSID-II), M-CHAT and a medical history form. Outcome measures included the distribution of failed M-CHAT items among groups classified according to cerebral palsy diagnosis, gross motor function, BSID-II scores and vision or hearing impairments. M-CHAT items were failed more frequently by children with concurrently identified impairments (motor, cognitive, vision and hearing). In addition, the frequency of item failure increased with the severity of impairment. The failed M-CHAT items were often, but not consistently, related to children's specific impairments. Importantly, four of the six M-CHAT 'critical items' were commonly affected by presence and severity of concurrent impairments. The strong association between impaired sensory or motor function

and M-CHAT results among extremely low gestational age children suggests that such impairments might give rise to false positive M-CHAT screening.

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22. Semin Perinatol. 2011 Jun;35(3):185-91.

A global need for affordable neonatal jaundice technologies.

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Globally, health care providers worldwide recognize that severe neonatal jaundice is a "silent" cause of significant neonatal morbidity and mortality. Untreated neonatal jaundice can lead to death in the neonatal period and to kernicterus, a major cause of neurologic disability (choreo-athetoid cerebral palsy, deafness, language difficulty) in children who survive this largely preventable neonatal tragedy. Appropriate technologies are urgently needed. These include tools to promote and enhance visual assessment of the degree of jaundice, such as simpler transcutaneous bilirubin measurements and readily available serum bilirubin measurements that could be incorporated into routine treatment and follow-up. Widespread screening for glucose-6-phoshate dehydrogenase deficiency is needed because this is often a major cause of neonatal jaundice and kernicterus worldwide. Recognition and treatment of Rh hemolytic disease, another known preventable cause of kernicterus, is critical. In addition, effective phototherapy is crucial if we are to make kernicterus a "never-event." Finally it is essential that we conduct appropriate population-based studies to accurately elucidate the magnitude of the problem. However, knowledge alone is not sufficient. If we are to implement these and other programs and technologies to relegate severe neonatal jaundice and its sequelae to the history books, screening and interventions must be low cost and technologically appropriate for low and middle income nations.

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