Cerebral Palsy Alliance

NEWS
Cerebral Palsy Research

Monday 14 October 2013

Cerebral Palsy Alliance is delighted to bring you this free weekly bulletin of the latest published research into cerebral palsy.

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Interventions and Management

Please note: The results this week may be limited due to the US government shutdown, which has affected the operations of the National Center for Biotechnology Information (NCBI).

1. Conf Proc IEEE Eng Med Biol Soc. 2013 Jul;2013:7100-7103.

A stabilized dual Kalman filter for adaptive tracking of brain-computer interface decoding parameters.

Zhang Y, Chase SM.

Neural prosthetics are a promising technology for alleviating paralysis by actuating devices directly from the intention to move. Typical implementations of these devices require a calibration session to define decoding parameters that map recorded neural activity into movement of the device. However, a major factor limiting the clinical deployment of this technology is stability: with fixed decoding parameters, control of the prosthetic device has been shown to degrade over time. Here we apply a dual estimation procedure to adaptively capture changes in decoding parameters. In simulation, we find that our stabilized dual Kalman filter can run autonomously for hundreds of thousands of trials with little change in performance. Further, when we apply our algorithm off-line to estimate arm trajectories from neural data recorded over five consecutive days, we find that it outperforms a static Kalman filter, even when it is re-calibrated at the beginning of each day.

PMID: 24111381 [PubMed - as supplied by publisher]

2. Eur J Paediatr Neurol. 2013 Sep 25. pii: S1090-3798(13)00133-5. doi: 10.1016/j.ejpn.2013.08.003. [Epub ahead of print]

The effect of continuous intrathecal baclofen on sitting in children with severe cerebral palsy.

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AIM: To investigate the effect of intrathecal baclofen (ITB) on sitting in children with cerebral palsy with severe spasticity; and identify potential sub-groups of patients at particular risk of deterioration. METHOD: Twenty three children with cerebral palsy, mean age 10 yrs 10 mo were assessed before and after ITB treatment using the

Sitting dimension of the Gross Motor Function Measure. Sitting prior to treatment was compared to sitting following ITB treatment in the same children. Exploration of sub groups was also attempted to investigate affects of ITB on sitting according to age and severity of motor impairment. RESULTS: No significant difference was found in sitting before ITB treatment compared to sitting following insertion of an ITB pump (p = 0.09). No specific age group or classification of motor impairment demonstrated significant deterioration in sitting following ITB treatment. CONCLUSION: Sitting does not improve or deteriorate in children following treatment with ITB, independent of age or severity of motor impairment.

PMID: 24100173 [PubMed - as supplied by publisher]

3. Eur J Phys Rehabil Med. 2013 Oct 9. [Epub ahead of print]

Feasibility and test-retest reliability of measuring lower-limb strength in young children with cerebral palsy.

Van Vulpen LF, De Groot S, Becher JG, De Wolf GS, Dallmeijer AJ.

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Background: Quantifying leg muscle strength in young children with cerebral palsy (CP) is essential for identifying muscle groups for treatment and for monitoring progress. Aim: To study the feasibility, intratester reliability and the optimal test design (number of test occasions and repetitions) of measuring lower-limb strength with handheld dynamometry (HHD) and dynamic ankle plantar flexor strength with the standing heel-rise (SH) test in 3-10 year aged children with CP. Design: Test-retest design. Setting: Rehabilitation centre, special needs school for children with disabilities, and university medical centre. Methods: Knee extensor, hip abductor and calf muscle strength was assessed in 20 ambulatory children with spastic CP (3-5 years [N.=10] and 6-10 years [N.=10]) on two test occasions. Intraclass correlation coefficients (ICC) and Smallest Detectable Differences (SDD) were calculated to determine the optimal test design for detecting changes in strength. Results: All isometric strength tests had acceptable SDDs (9-30%), when taking the mean values of 2-3 test occasions (separate days) and 2-3 repetitions. The one-leg SH test had large SDDs (40-128% for younger group, 23-48% for older group). Conclusion: Isometric strength (improvements) can only be measured reliably with HHD in young children with CP when the average values over at least 2 test occasions are taken. Reliability of the SH test is not sufficient for measuring individual changes in dynamic muscle strength in the younger children. Clinical Rehabilitation Impact: Results of this study can be used to determine the optimal number of test occasions and repetitions for reliable HHD measurements depending on expected changes, muscle group and age in 3-10 year old children with CP.

PMID: 24104698 [PubMed - as supplied by publisher]

4. Dev Med Child Neurol. 2013 Sep 24. doi: 10.1111/dmcn.12277. [Epub ahead of print]

Selection criteria for selective dorsal rhizotomy in children with spastic cerebral palsy: a systematic review of the literature.

Grunt S, Fieggen AG, Vermeulen RJ, Becher JG, Langerak NG.

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AIM: Information regarding the selection procedure for selective dorsal rhizotomy (SDR) in children with spastic cerebral palsy (CP) is scarce. Therefore, the aim of this study was to summarize the selection criteria for SDR in children with spastic CP. METHOD: A systematic review was carried out using the following databases: MEDLINE, CINAHL, EMBASE, PEDro, and the Cochrane Library. Additional studies were identified in the reference lists. Search terms included 'selective dorsal rhizotomy', 'functional posterior rhizotomy', 'selective posterior rhizotomy', and 'cerebral palsy'. Studies were selected if they studied mainly children (<18y of age) with spastic CP, if they had an intervention of SDR, if they had a detailed description of the selection criteria, and if they were in English. The levels of evidence, conduct of studies, and selection criteria for SDR were scored. RESULTS: Fifty-two studies were included. Selection criteria were reported in 16 International Classification of Functioning, Disability and Health model domains including 'body structure and function' (details concerning spasticity [94%], other movement

abnormalities [62%], and strength [54%]), 'activity' (gross motor function [27%]), and 'personal and environmental factors' (age [44%], diagnosis [50%], motivation [31%], previous surgery [21%], and follow-up therapy [31%]). Most selection criteria were not based on standardized measurements. INTERPRETATION: Selection criteria for SDR vary considerably. Future studies should describe clearly the selection procedure. International meetings of experts should develop more uniform consensus guidelines, which could form the basis for selecting candidates for SDR.

PMID: 24106928 [PubMed - as supplied by publisher]

5. Gait Posture. 2013 Sep;38(4):770-776. doi: 10.1016/j.gaitpost.2013.03.019. Epub 2013 Apr 15.

Three-dimensional head and trunk movement characteristics during gait in children with spastic diplegia.

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This study uses a recently developed trunk model to determine which head and trunk kinematic parameters differentiate children with spastic diplegia from typically developing (TD) children while walking. Differences in head and trunk parameters in relation to the severity of the motor involvement (GMFCS levels) were additionally examined. The trunk model consisted of five segments (pelvis, thorax, head, shoulder line, spine). Discrete kinematic parameters (ROM, mean position) and angular waveforms were compared between 20 children with spastic diplegia (age 9.8 years±2.9 years; GMFCS I: n=10, GMFCS II: n=10) and 20 individually age-matched TD children (9.7 years±3 years). A new measure for overall trunk pathology, the trunk profile score (TPS), was proposed and included in the comparative analysis. Compared to TD children, children with GMFCS II showed a significantly higher TPS and increased ROM for pelvis tilt, for thorax and head in nearly all planes, and the angle of kyphosis. In children with GMFCS I, only ROM of thorax lateral bending was significantly increased. Sagittal ROM differentiated best between GMFCS levels, with higher ROM found in children with GMFCS II. Current results provide new insights into head and trunk kinematics during gait in children with spastic diplegia.

PMID: 23597939 [PubMed - as supplied by publisher]

6. Conf Proc IEEE Eng Med Biol Soc. 2013 Jul;2013:6341-6344.

Classification of stand-to-sit and sit-to-stand movement from low frequency EEG with locality preserving dimensionality reduction.

Bulea TC, Prasad S, Kilicarslan A, Contreras-Vidal JL.

Recent studies have demonstrated decoding of lower extremity limb kinematics from noninvasive electroencephalography (EEG), showing feasibility for development of an EEG-based brain-machine interface (BMI) to restore mobility following paralysis. Here, we present a new technique that preserves the statistical richness of EEG data to classify movement state from time-embedded low frequency EEG signals. We tested this new classifier, using cross-validation procedures, during sit-to-stand and stand-to-sit activity in 10 subjects and found decoding accuracy of greater than 95% on average. These results suggest that this classification technique could be used in a BMI system that, when combined with a robotic exoskeleton, can restore functional movement to individuals with paralysis.

PMID: 24111191 [PubMed - as supplied by publisher]

7. BMC Pediatr. 2013 Oct 11;13(1):168. [Epub ahead of print]

Effect of transcranial direct current stimulation combined with gait and mobility training on functionality in children with cerebral palsy: study protocol for a double-blind randomized controlled clinical trial.

Grecco LA, Duarte ND, de Mendonça ME, Pasini H, Lima VL, Franco RC, de Oliveira LV, de Carvalho PD, Corrêa JC, Collange NZ, Sampaio LM, Galli M, Fregni F, Oliveira CS.

BACKGROUND: The project proposes three innovative intervention techniques (treadmill training, mobility training with virtual reality and transcranial direct current stimulation that can be safely administered to children with cerebral palsy. The combination of transcranial stimulation and physical therapy resources will provide the training of a specific task with multiple rhythmic repetitions of the phases of the gait cycle, providing rich sensory stimuli with a modified excitability threshold of the primary motor cortex to enhance local synaptic efficacy and potentiate motor learning. Methods/design: A prospective, double-blind, randomized, controlled, analytical, clinical trial will be carried out. Eligible participants will be children with cerebral palsy classified on levels I,II and III of the Gross Motor Function Classification System between four and ten years of age. The participants will be randomly allocated to four groups:1)gait training on a treadmill with placebo transcranial stimulation;2)gait training on a treadmill with active transcranial stimulation;3) mobility training with virtual reality and placebo transcranial stimulation;4)mobility training with virtual reality and active transcranial stimulation. Transcranial direct current stimulation will be applied with the anodal electrode positioned in the region of the dominant hemisphere over C3,corresponding to the primary motor cortex, and the cathode positioned in the supraorbital region contralateral to the anode. A 1mA current will be applied for 20 minutes. Treadmill training and mobility training with virtual reality will be performed in 30-minute sessions five times a week for two weeks (total of 10 sessions). Evaluations will be performed on four occasions: one week prior to the intervention; one week following the intervention; one month after the end of the intervention; and 3 months after the end of the intervention. The evaluations will involve three-dimensional gait analysis, analysis of cortex excitability (motor threshold and motor evoked potential), Six-Minute Walk Test, Timed Up-and-Go Test, Pediatric Evaluation Disability Inventory, Gross Motor Function Measure, Berg Balance Scale,stabilometry, maximum respiratory pressure and an effort test. DISCUSSION: This paper offers a detailed description of a prospective, double-blind, randomized, controlled, analytical, clinical trial aimed at demonstrating the effect combining transcranial stimulation with treadmill and mobility training on functionality and primary cortex excitability in children with Cerebral Palsy classified on Gross Motor Function Classification System levels I, II and III. The results will be published and will contribute to evidence regarding the use of treadmill training on this population. Trial registration: ReBEC RBR-9B5DH7.

PMID: 24112817 [PubMed - as supplied by publisher]

8. Res Dev Disabil. 2013 Oct 1;34(11):4280-4285. doi: 10.1016/j.ridd.2013.09.019. [Epub ahead of print]

Use of the Gait Profile Score for the evaluation of patients with joint hypermobility syndrome/Ehlers-Danlos syndrome hypermobility type.

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Gait analysis (GA) is widely used for clinical evaluations in various pathological states, both in children and in adults, such as in patients with joint hypermobility syndrome/Ehlers-Danlos syndrome hypermobility type (JHS/EDS -HT). Otherwise, GA produces a large volume of data and there is the clinical need to provide also a quantitative measure of the patient's overall gait. Starting from this aim some global indexes were proposed by literature as a summary measure of the patient's gait, such as the Gait Profile Score (GPS). While validity of the GPS was demonstrated for the evaluation of the functional limitation of children with Cerebral Palsy, no studies have been conducted in patients JHS/EDS-HT. The aim of our study was therefore to investigate the effectiveness of the GPS in the quantification of functional limitation of patients with JHS/EDS-HT. Twenty-one adult (age: 36.1±12.7 years) individuals with JHS/EDS-HT were evaluated using GA and from GA data the GPS was computed. The results evidenced that the GPS value of patients was 8.9±2.6, statistically different from 4.6±0.9 displayed by the control group. In particular, all values of Gait Variable Scores (GVS) which compose the GPS were higher if compared to controls, with the exception of Pelvic Tilt and Foot Progression. The correlations between GPS/GVS and Lower Extremity Functional Scale (LEFS) showed significant relationship between GPS and the item 11 ("Walking 2

blocks") (ρ=-0.56; p<0.05) and 12 ("Walking a mile") of LEFS (ρ=-0.76; p<0.05). Our results showed that GPS and GVS seem to be appropriate outcome measures for the evaluation of the functional limitation during gait of patients with JHS/EDS-HT.

PMID: 24095856 [PubMed - as supplied by publisher]

9. Dev Med Child Neurol. 2013 Sep 18. doi: 10.1111/dmcn.12276. [Epub ahead of print]

Reproducibility of an instrumented measure for passive ankle dorsiflexion in conscious and anaesthetized children with cerebral palsy.

Hastings-Ison T, Blackburn C, Opie NL, Graham HK, Rawicki B, Wolfe R, Simpson P, Baker R.

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AIM: The aims of this study were to (1) determine whether an instrumented measure will reduce measurement error to less than 5° in children with cerebral palsy (CP), (2) determine agreement and reliability of this instrumented measure in both conscious and anaesthetized participants, and (3) compare the method with previously reported measures. METHOD: Thirty-four ambulant children (15 males, 19 females), aged 3 to 9 years, with spastic CP were studied in a tertiary-care paediatric hospital (21 with hemiplegia, 11 with diplegia, and two with quadriplegia). The majority of children functioned at Gross Motor Function Classification System level I (n=11) or II (n=18), with five children at level III. Ankle dorsiflexion at 50% bodyweight was photographed and measured. Each child was measured when conscious and when under mask anaesthesia by two experienced assessors. RESULTS: The standard error of measurement (SEM) ranged from 3.9° (anaesthetized; 95% confidence interval [CI] 3.3-4.0°) to 6.7° (conscious; 95% CI 5.3-8.0°). This compared favourably with previously reported dorsiflexion measures (SEM range 6.5-7.8°) in conscious children with CP. Intrarater reliability was good in both conditions (intraclass correlation coefficient [ICC]: range 0.95 [anaesthetized; 95% CI 0.92-0.98] to 0.86 [conscious; 95% CI 0.76-0.95]). The ICC for interrater reliability ranged from 0.87 (anaesthetized; 95% CI 0.81-0.93) to 0.65 (conscious; 95% CI 0.50-0.81). INTERPRETATION: Passive ankle dorsiflexion using an instrumented measure has face validity and may assist in the improvement of reproducibility under anaesthesia for clinical research. When an individual is conscious, this technique is not better than trained assessors using conventional goniometry reported in the literature and is not recommended for routine clinical use.

PMID: 24102238 [PubMed - as supplied by publisher]

10. Handb Clin Neurol. 2013;116C:167-187. doi: 10.1016/B978-0-444-53497-2.00014-0.

Deep brain stimulation for dystonia.

Vidailhet M, Jutras MF, Roze E, Grabli D.

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The few reported controlled studies show that bilateral stimulation of the globus pallidus interna (GPi) is a safe and effective long-term treatment for hyperkinetic disorders. However, the recently published data on deep brain stimulation (DBS) applied to different targets or patients (especially those with secondary dystonia) are mainly uncontrolled case reports, precluding a clear determination of its efficacy, and providing little guidance as to the choice of a "good" target in a "good" patient. This chapter reviews the literature on DBS in primary dystonia, paying particular attention to the risk:benefit ratio in focal and segmental dystonias (cervical dystonia, cranial dystonia) and to the predictive factors for a good outcome. The chapter also highlights recent data on the marked benefits of the technique in myoclonus dystonia (in which pallidal, as opposed to thalamic, stimulation is more effective) and in tardive dystonia-dyskinesia. Although, the decision to treat appears relatively straightforward in patients with

primary dystonia, myoclonus-dystonia, and tardive dystonia who have a normal findings on magnetic resonance imaging and normal cognitive function, there are still no reliable tools to help predict the timescale of postoperative benefit. This chapter provides a comprehensive analysis of the use of the treatment in various types of secondary dystonia, with little to moderate benefit in most cases, based on single cases or small series. Beyond the reduction in the severity of dystonia, the global motor and functional outcome is difficult to determine owing to the paucity of adequate evaluation tools. Because of the large interpatient variability, different targets may be effective depending on the symptoms in each individual.

PMID: 24112893 [PubMed - as supplied by publisher]

11. Cytotherapy. 2013 Oct 5. pii: S1465-3249(13)00561-6. doi: 10.1016/j.jcyt.2013.06.001. [Epub ahead of print]

Effects of bone marrow mesenchymal stromal cells on gross motor function measure scores of children with cerebral palsy: a preliminary clinical study.

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BACKGROUND AIMS: Pre-clinical evidence indicates that autologous bone marrow-derived mesenchymal stromal cell (BM-MSC) transplantation improves motor function in patients with central nervous system disorders. METHODS: After providing informed consent, 52 patients with cerebral palsy (CP) who met the study criteria received BM-MSC transplantation. Gross motor function was assessed using the Gross Motor Function Measure (GMFM)-88 and GMFM-66 scales at baseline (before transplantation) and at 1 month, 6 months and 18 months post-transplantation. The participants completed the trial without visible side effects. The GMFM-66 percentile (motor growth curves) was used as the control index of motor function to exclude the interference of improvement with age. RESULTS: The score domains A, B, C and D and the total GMFM-88 and GMFM-66 scores in participants increased at 1 month, 6 months and 18 months post-transplantation compared with the baseline value ($P < 0.01$). The scores of domain E also increased at 6 months and 18 months post-transplantation, although they were not significantly increased at 1 month post-transplantation. There were significant increases in the GMFM-66 score and the GMFM-66 percentile corresponding to patient age and Gross Motor Function Classification System level after cell transplantation. CONCLUSIONS: Autologous BM-MSC transplantation appears to be a feasible, safe and effective therapy for patients with CP. The treatment improved the development of children with CP with regard to motor function.

PMID: 24100132 [PubMed - as supplied by publisher]

12. Dev Neurorehabil. 2013 Oct 8. [Epub ahead of print]

Supporting communication for children with cerebral palsy in hospital: Views of community and hospital staff.

Hemsley B, Lee S, Munro K, Seedat N, Bastock K, Davidson B.

Faculty of Education and the Arts, The University of Newcastle , Newcastle , Australia.

Objective: We aimed to investigate the views of allied health and nursing staff on supporting the communication of children with cerebral palsy (CP) and complex communication needs (CCN) in hospital. Method: We conducted 12 focus groups with 49 community- and hospital-based allied health professionals and hospital nurses. Results: Participants reported having active roles in supporting children's seating, mobility, equipment, mealtime management and psychosocial needs, but not in supporting the children's communication in hospital. Participants described several environmental barriers to supporting children's augmentative and alternative communication

(AAC) in hospital, and suggested a range of strategies to ease communication difficulties at the bedside. Conclusion: Results indicate a potential new role for community- and hospital-based health professionals in supporting nurses to implement AAC strategies at the bedside. Supporting nursing staff to remove environmental barriers and use communication technologies might create a more communicatively accessible hospital ward for children with CP and CCN.

PMID: 24102353 [PubMed - as supplied by publisher]

13. Conf Proc IEEE Eng Med Biol Soc. 2013 Jul;2013:6111-6114.

An inertial sensor-based system to develop motor capacity in children with cerebral palsy.

Qiao S, Prabhakar A, Chandrachoodan N, Jacob N, Vathsangam H.

Learning to communicate with alternative augmentative communication devices can be difficult because of the difficulty of achieving controlled interaction while simultaneously learning to communicate. What is needed is a device that harnesses a child's natural motor capabilities and provides the means to reinforce them. We present a kinematic sensor-based system that learns a child's natural gestural capability and allows him/her to practice those capabilities in the context of a game. Movement is captured with a single kinematic sensor that can be worn anywhere on the body. A gesture recognition algorithm interactively learns gesture models using kinematic data with the help of a nearby teacher. Learned gesture models are applied in the context of a game to help the child practice gestures to gain better consistency. The system was successfully tested with a child over two sessions. The system learned four candidate gestures: lift hand, sweep right, twist right and punch forward. These were then used in a game. The child showed better consistency in performing the gestures as each session progressed. We aim to expand on this work by developing qualitative scores of movement quality and quantifying algorithm accuracy on a larger population over long periods of time.

PMID: 24111134 [PubMed - as supplied by publisher]

14. Ann Indian Acad Neurol. 2013 Jul;16(3):342-346.

Effects of oral motor therapy in children with cerebral palsy.

Sığan SN, Uzunhan TA, Aydınlı N, Eraslan E, Ekici B, Calışkan M.

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AIM: Oral motor dysfunction is a common issue in children with cerebral palsy (CP). Drooling, difficulties with sucking, swallowing, and chewing are some of the problems often seen. In this study, we aimed to research the effect of oral motor therapy on pediatric CP patients with feeding problems. MATERIALS AND METHODS: Included in this single centered, randomized, prospective study were 81 children aged 12-42 months who had been diagnosed with CP, had oral motor dysfunction and were observed at the Pediatric Neurology outpatient clinic of the Children's Health and Diseases Department, Istanbul Medical Faculty, Istanbul University. Patients were randomized into two groups: The training group and the control group. One patient from the training group dropped out of the study because of not participating regularly. Following initial evaluation of all patients by a blinded physiotherapist and pedagogue, patients in the training group participated in 1 h oral motor training sessions with a different physiotherapist once a week for 6 months. All patients kept on routine physiotherapy by their own physiotherapists. Oral motor assessment form, functional feeding assessment (FFA) subscale of the multidisciplinary feeding profile (MFP) and the Bayley scales of infant development (BSID-II) were used to evaluate oral motor function, swallowing, chewing, the gag reflex, the asymmetrical tonic neck reflex, tongue, jaw, and mouth function, severity of drooling, aspiration, choking, independent feeding and tolerated food texture during the initial examination and 6 months later. RESULTS: When the initial and post-therapy FFA and BSID-II scores received by patients in the training and the study group were compared, the training group showed a statistically significant improvement ($P < 0.05$). CONCLUSION: Oral motor therapy has a beneficial effect on feeding problems in children with CP.

PMID: 24101813 [PubMed - as supplied by publisher] PMCID: PMC3788277 Free PMC Article

15. J Pediatr Surg. 2013 Oct;48(10):2171-2174. doi: 10.1016/j.jpedsurg.2013.06.017.

Which surgery for drooling in patients with cerebral palsy?

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BACKGROUND: Surgery for drooling in patients with cerebral palsy should not produce xerostomia in order not to deteriorate speech, taste, or the status of oral hygiene. It must be a compromise between drooling and quality of life. The purpose of the present report is to describe our surgical strategy that respects the above principles. MATERIALS AND METHODS: Patients were initially operated on depending on the drooling severity. The results were evaluated according to the frequency of residual drooling and the Thomas-Stonel and Greenberg classification. Quantitative assessment was proposed 6months after surgery. The data have been compared using the nonparametric Wilcoxon matched-pairs test. RESULTS: Thirty-five patients underwent surgery between 1991 and 2012. Owing to incomplete data, only 31 patients could be included, aged 5 to 24years (mean: 12years). All patients underwent surgery on the submandibular duct. Only 16 patients underwent a simultaneous surgery on the parotid duct. Six patients were reoperated: 3 because of an insufficient result and 3 because of a surgical complication. Changes/Day ranged from 1 to 7 (median: 3) before surgery and 0 to 2 (median: 1) after surgery ($p<0.01$). Number of bibs/day ranged from 0 to 30 (median: 4) before surgery and 0 to 4 (median: 1) after surgery ($p<0.01$). No dental deterioration and no caries occurred after surgery. CONCLUSION: Good results for drooling can be obtained with a simple surgical procedure on the submandibular ducts, maintaining quality of life, avoiding deterioration of speech, taste, and the status of oral hygiene.

PMID: 24094976 [PubMed - as supplied by publisher]

16. Eur J Phys Rehabil Med. 2013 Oct 9. [Epub ahead of print]

Depression and anxiety levels in mothers of children with cerebral palsy: a controlled study.

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Background: Studies investigating depression and anxiety levels in mothers of children with CP and related factors are limited, and controversial findings are reported in these studies. Aim: The study was aimed to determine depression and anxiety levels in mothers of children with cerebral palsy (CP) and to define factors related to depression and anxiety levels. Design: A descriptive study. Setting: Outpatient physical medicine and rehabilitation clinic of an education and research hospital. Population: The study was composed of two groups: group 1, 116 mothers of children with CP and group 2, 114 mothers of healthy children. Methods: Mothers of children with spastic-type CP were included into group 1. Functional levels in children with CP were investigated with The Gross Motor Function Classification System (GMFCS). Depression levels of mothers in both groups were assessed with Beck Depression Inventory (BDI), and anxiety levels with Beck Anxiety Inventory (BAI). Results: BDI and BAI scores were statistically and significantly higher in group 1, compared to group 2. Among mothers in group 1, a positive correlation was determined between GMFCS score, and depression and anxiety levels. However, no correlation was detected between depression and anxiety levels, and body involvement of CP, education status, age and economic level among patients. In logistic regression analysis, the most significant risk factors of depressive symptoms were detected to be GMFCS score and speech defects. Conclusion: Our findings indicate that depression and anxiety levels of mothers with CP children are higher than those with healthy children and associated with speech defects and functional disability levels in children with CP. Healthcare professionals should take into account that depression and anxiety levels may be higher in mothers of children with CP. Clinical Rehabilitation Impact: For an effective rehabilitation program related to children with CP, depression and anxiety levels in mothers of such children should be taken into account, and mothers should closely be followed and if necessary, psychologically supported.

PMID: 24104700 [PubMed - as supplied by publisher]

17. Neuromodulation. 2013 Sep 24. doi: 10.1111/ner.12110. [Epub ahead of print]

Successful Use of Sacral Neuromodulation in a 12-Year-Old With Cerebral Palsy and Neurogenic Bladder.

Lippmann QK, Geller EJ.

Department of Obstetrics and Gynecology, University of North Carolina at Chapel Hill School of Medicine, Chapel Hill, NC, USA; Division of Female Pelvic Medicine and Reconstructive Surgery.

PMID: 24112597 [PubMed - as supplied by publisher]

18. Ann Indian Acad Neurol. 2013 Jul;16(3):455.

A comment on sleep assessment of children with cerebral palsy: Using validated sleep questionnaire.

Raina SK.

Department of Community Medicine, DR. RPGMC, Tanda, Kangra, Himachal Pradesh, India.

PMID: 24101847 [PubMed - as supplied by publisher] PMCID: PMC3788311 Free PMC Article

19. Kathmandu Univ Med J (KUMJ). 2013 April-June;11(42):110-116.

Clinical and Electroencephalographic Profile Of Children.

Limbu N, Paudel BH, Thakur D.

Department of Basic and Clinical Physiology, B.P. Koirala Institute of Health Sciences (BPKIHS) Dharan, Nepal.

Background Reports on pediatric electroencephalogram of Nepalese patients are rare. Objective We aimed to study the relationship between provisional clinical and electrophysiological diagnoses of pediatric patients with documentation of demographic profiles, and type and frequency of the disorders/diseases. Methods Electroencephalographic reports of 634 children from 2006 to 2009 were analyzed at neurophysiology laboratory, department of Basic and Clinical Physiology, B. P. Koirala Institute of Health Sciences, Dharan, Nepal, retrospectively. Chi-Square test was applied after detail descriptive statistics. Results Male and female were 72.2 % (n=458/634) and 27.76 % (n=176/634) respectively. Most frequent EEG abnormality was seizure disorder (n=370, 59.39%), then febrile seizure (n= 94, 15.08%) and birth asphyxia with hypoxic-induced encephalopathy (n=68, 10.91%). Electroencephalogram showed significant epileptiform discharges in seizure disorder (p=0.001, OR= 2.26, 95 % CI= 1.61 to 3.18) and in cerebral palsy (p=0.049, OR=6.88, 95 % CI=0.89 to 145.95), specifically in 6 to 12 (p=0.001, OR=2.94, 95 % CI=1.43 to 6.06) and one to five (p=0.019) years, respectively. Electroencephalogram detected significantly less epileptiform discharges (p=0.001, OR=0.25, 95 % CI= 0.15 to 0.42) in febrile seizure specifically in 1 to 5 years (p=0.003, OR=0.16, 95 % CI= 0.04 to 0.63). Conclusion Predominant Electroencephalographic abnormality was seizure disorder, followed by febrile seizure and birth asphyxia with hypoxic-induced encephalopathy respectively. Electroencephalographic abnormality was highly associated with seizure disorder and cerebral palsy but was not associated with febrile seizure.

PMID: 24096216 [PubMed - as supplied by publisher]

20. Stat Methods Med Res. 2013 Oct 9. [Epub ahead of print]

Item response theory and structural equation modelling for ordinal data: Describing the relationship between KIDSCREEN and Life-H.

Titman AC, Lancaster GA, Colver AF.

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Both item response theory and structural equation models are useful in the analysis of ordered categorical responses from health assessment questionnaires. We highlight the advantages and disadvantages of the item response theory and structural equation modelling approaches to modelling ordinal data, from within a community health setting. Using data from the SPARCLE project focussing on children with cerebral palsy, this paper investigates the relationship between two ordinal rating scales, the KIDSCREEN, which measures quality-of-life, and Life-H, which measures participation. Practical issues relating to fitting models, such as non-positive definite observed or fitted correlation matrices, and approaches to assessing model fit are discussed. item response theory models allow properties such as the conditional independence of particular domains of a measurement instrument to be assessed. When, as with the SPARCLE data, the latent traits are multidimensional, structural equation models generally provide a much more convenient modelling framework.

PMID: 24108271 [PubMed - as supplied by publisher]

21. Zh Nevrol Psikhiatr Im S S Korsakova. 2013;113(9):48-53.

Management of cognitive impairment in children and adolescents with cerebral palsy treated with pantocalcin [Article in Russian]

Batysheva TT, Platonova AN, Chebanenko NV, Bykova OV.

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A randomized study on the efficacy and safety of the hopantenic acid preparation (pantocalcin) and its effect on cognitive functions in children with cerebral palsy (CCP) has been carried out. The positive effect of pantocalcin on the visual memory and attention concentration, activity and fatigability has been shown. At the same time, there was a decrease of anxiety in children and adolescents with CCP. No evidence for the effect of the drug on visual-motor skills has been found. The results of the study have demonstrated the high safety profile of pantocalcin when used in pediatric practice.

PMID: 24107880 [PubMed - as supplied by publisher]

Prevention and Cure

22. Dev Med Child Neurol. 2013 Sep 20. doi: 10.1111/dmcn.12262. [Epub ahead of print]

What constitutes cerebral palsy in the twenty-first century?

Smithers-Sheedy H, Badawi N, Blair E, Cans C, Himmelmann K, Krägeloh-Mann I, McIntyre S, Slee J, Uldall P, Watson L, Wilson M.

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AIM: Determining inclusion/exclusion criteria for cerebral palsy (CP) surveillance is challenging. The aims of this paper were to (1) define inclusion/exclusion criteria that have been adopted uniformly by surveillance programmes and identify where consensus is still elusive, and (2) provide an updated list of the consensus concerning CP inclusion/exclusion when a syndrome/disorder is diagnosed. METHOD: Data were drawn from an international survey of CP registers, the New South Wales CP Register (1993-2003), the Western Australian CP Register (1975-2008), and the Surveillance of CP in Europe (SCPE; 1976-1998). An expert panel used a consensus building technique, which utilized the SCPE 'decision tree' and the original 'What constitutes cerebral palsy?' paper as frameworks. RESULTS: CP surveillance programmes agree on key clinical criteria pertaining to the type, severity, and origin of motor disorder in CP. Further work is warranted to reach agreement for (1) minimum age of survival and maximum age of postneonatal brain injury, and (2) metabolic disorders with highly variable clinical courses/responses to treatment. One hundred and ninety-seven syndromes/disorders were reviewed and advice on their inclusion/exclusion is provided. INTERPRETATION: What constitutes CP will continue to evolve as diagnostics improve. Surveillance programmes throughout the world are committed to addressing their differences regarding inclusion/exclusion criteria for the umbrella term CP.

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23. Pediatr Res. 2013 Sep 3. doi: 10.1038/pr.2013.155. [Epub ahead of print]

Erythropoietin signaling promotes oligodendrocyte development following prenatal systemic hypoxic-ischemic brain injury.

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Background: Brain injury from preterm birth causes white matter injury (WMI), and it leads to chronic neurological deficits including cerebral palsy, epilepsy, cognitive, and behavioral delay. Immature O4+ oligodendrocytes are particularly vulnerable to WMI. Understanding how the developing brain recovers after injury is essential to finding more effective therapeutic strategies. Erythropoietin (EPO) promotes neuronal recovery after injury; however, its role in enhancing oligodendroglial lineage recovery is unclear. Previously, we found that recombinant EPO (rEPO) treatment enhances myelin basic protein (MBP) expression and functional recovery in adult rats after prenatal transient systemic hypoxia-ischemia (TSHI). We hypothesized that after injury, rEPO would enhance oligodendroglial lineage cell genesis, survival, maturation, and myelination.Methods:In vitro assays were used to define how rEPO contributes to specific stages of oligodendrocyte development and recovery after TSHI.Results:After prenatal TSHI injury, rEPO promotes genesis of oligodendrocyte progenitors from oligodendrospheres, survival of oligodendrocyte precursor cells (OPCs) and O4+ immature oligodendrocytes, O4+ cell process extension, and MBP expression. rEPO did not alter OPC proliferation.Conclusion:Together, these studies demonstrate that EPO signaling promotes critical stages of oligodendroglial lineage development and recovery after prenatal TSHI injury. EPO treatment may be beneficial to preterm and other infant patient populations with developmental brain injury hallmarked by WMI.Pediatric Research (2013); doi:10.1038/

pr.2013.155.

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24. Stroke. 2013 Oct 8. [Epub ahead of print]

Life After Perinatal Stroke.

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PMID: 24105698 [PubMed - as supplied by publisher]

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