Cerebral Palsy Research NEWS

Monday 13 January 2014

Professor Nadia Badawi
Macquarie Group Foundation Chair of Cerebral Palsy
PO Box 560, Darlinghurst, New South Wales 2010 Australia

Interventions and Management

1. BMC Neurol. 2014 Jan 8;14(1):6.

Unravelling developmental disregard in children with unilateral cerebral palsy by measuring event-related potentials during a simple and complex task.

Zielinski IM, Jongsma ML, Baas CM, Aarts PB, Steenbergen B.

BACKGROUND: In a subset of children with unilateral Cerebral Palsy (CP) a discrepancy between capacity and performance of the affected upper limb can be observed. This discrepancy is known as Developmental Disregard (DD). Though the phenomenon of DD has been well documented, its underlying cause is still under debate. DD has originally been explained based on principles of operant conditioning. Alternatively, it has been proposed that DD results from a diminished automaticity of movements, resulting in an increased cognitive load when using the affected hand. To investigate the amount of involved cognitive load we studied Event-Related Potentials (ERPs) preceding task-related motor responses during a single-hand capacity and a dual-hand performance task. It was hypothesised that children with DD show alterations related to long-latency ERP components when selecting a response with the affected upper limb, reflecting increased cognitive load in order to generate an adequate response and especially so within the dual-hand task. METHODS: Fifteen children with unilateral CP participated in the study. One of the participants was excluded due to major visual impairments. Seven of the remaining participants displayed DD. The other seven children served as a control group. All participants performed two versions of a cue-target paradigm, a single-hand capacity and a dual-hand performance task. The ERP components linked to target presentation were inspected: the mid-latency P2 component and the consecutive long -latency N2b component. RESULTS: In the dual-hand performance task children with DD showed an enhancement in mean amplitude of the long-latency N2b component when selecting a response with their affected hand. No differences were found regarding the amplitude of the mid-latency P2 component. No differences were observed regarding the single-hand capacity task. The control group did not display any differences in ERPs linked to target evaluation processes between both hands. CONCLUSION: These electrophysiological findings show that DD is associated with increased cognitive load when movements are prepared with the affected hand during a dual-hand performance task. These findings confirm behavioural observations, advance our insights on the neural substrate of DD and have implications for therapy.

PMID: 24397355 [PubMed - as supplied by publisher] PMCID: PMC3893558 Free full text

2. Gait Posture. 2013 Dec 10. pii: S0966-6362(13)00695-4. doi: 10.1016/j.gaitpost.2013.11.022. [Epub ahead of print]

Three-dimensional analysis of performance of an upper limb functional task among adults with dyskinetic cerebral palsy.

Artilheiro MC1, Corrêa JC2, Cimolin V3, Lima MO4, Galli M5, de Godoy W6, Lucareli PR7.

Patients with dyskinetic cerebral palsy (DCP) experience considerable variability in their purposeful movements due to involuntary movements that contribute to functional impairment. Movement analyses can demonstrate how the movements involved in bringing a mug to the mouth are performed by patients with DCP. Sixteen adults with DCP (29.63±4.42 years) and eleven healthy adults (24.09±3.73 years) performed six consecutive movements of bringing a mug to the mouth using their dominant arm. The mug was placed at 75% of each subject's maximum reach. Kinematic data were captured by 10 cameras and processed using biomechanical software. Fifteen reflexive markers were placed on predetermined bony landmarks on the head, trunk and upper limbs. DCP adults required more time to perform the going (bringing the mug to the mouth), adjusting (simulating taking a drink) and returning (lowering the mug back to the table) phases, and their movements were less smooth than the controls, as indicated by the index of curvature, average jerk and number of movement units. The DCP adults took a longer time to complete the task than controls as indicated by the peak velocities, mean velocities and times to peak velocity. With respect to the angular parameters, DCP adults had a smaller range of motion for shoulder and elbow flexion and forearm pronation compared with the controls. The analysis of functional tasks represents an important measure for the evaluation of dyskinetic movements and permits the quantitative characterization of upper limb impairment in adults with DCP.

PMID: 24373786 [PubMed - as supplied by publisher]

3. Neurorehabil Neural Repair. 2013 Dec 27. [Epub ahead of print]

Comparison of Structured Skill and Unstructured Practice During Intensive Bimanual Training in Children With Unilateral Spastic Cerebral Palsy.

Brandão MB, Ferre C, Kuo HC, Rameckers EA, Bleyenheuft Y, Hung YC, Friel K, Gordon AM.

BACKGROUND: High-intensity training aims to improve hand function in children with unilateral spastic cerebral palsy (USCP). However, the extent to which skill training is required is not known. OBJECTIVES: To compare the effects of intensive bimanual training with and without structured progression of skill difficulty, on manual dexterity, bimanual hand use, daily functioning, and functional goals in children with USCP. METHOD: Twenty-two children were randomized to structured practice group (SPG) or unstructured practice group (UPG), and received 6 h/d training during 15 days. Children from the SPG were engaged in fine and gross motor bimanual activities, with skill progression and goal training. Children from UPG performed the same activities without skill progression or goal training. Participants were evaluated before, immediately and 6 months after training by a physical therapist blinded to group allocation. The primary outcomes were the Jebsen-Taylor Test of Hand Function (JTTHF) and Assisting Hand Assessment (AHA). Secondary outcomes included the Canadian Occupational Performance Measure (COPM), Pediatric Evaluation of Disability Inventory (PEDI), and ABILHAND-Kids. RESULTS: Both groups showed similar improvements in the JTTHF, AHA, ABILHAND-Kids, COPM-satisfaction, and PEDI ($P < .05$). A significant interaction in the COPM-performance scale ($P = .03$) showed superior improvements of the SPG immediately, but not 6 months, after the intervention. CONCLUSIONS: Children from both groups demonstrated improvements in dexterity and functional hand use. This suggests that for intensive bimanual approaches, intensive training at such high doses may not require structured practice to elicit improvements. However, there may be immediate added benefit of including goal training.

PMID: 24376067 [PubMed - as supplied by publisher]

4. Dev Med Child Neurol. 2013 Dec 27. doi: 10.1111/dmcn.12372. [Epub ahead of print]

Is constraint-induced movement therapy harmful in unilateral spastic cerebral palsy with ipsilateral cortico-spinal projections?

Staudt M, Berweck S.

PMID: 24372093 [PubMed - as supplied by publisher]

5. Gait Posture. 2013 Dec 1. pii: S0966-6362(13)00684-X. doi: 10.1016/j.gaitpost.2013.11.012. [Epub ahead of print]

Effect of compensatory trunk movements on knee and hip joint loading during gait in children with different orthopedic pathologies.

Stief F1, Böhm H2, Ebert C3, Döderlein L2, Meurer A4.

Ipsilateral trunk lean toward the affected stance limb has been identified as a compensatory mechanism to unload the hip joint. However, this altered gait pattern increases the lever arm around the knee joint by shifting the ground reaction vector more lateral to the knee joint center, which could be sufficient to deform the lateral compartment of the knee. The purpose of the present study was to show the effect of ipsilateral trunk lean on hip and knee joint moments in the frontal plane in 132 young patients with different orthopedic diagnosis. Linear correlations between ipsilateral trunk lean and the external knee and/or hip adduction moment were detected for patients with Legg-Calvé-Perthes disease (LCPD), arthrogryposis multiplex congenita, myelomeningocele, and unilateral cerebral palsy (CP). In contrast, children with bilateral CP did not show such a relationship due to an increased internal foot placement. In comparison to the hip joint, the effect of ipsilateral trunk lean in patients with LCPD is obviously more pronounced in the knee joint. The valgus thrust of the knee could initiate degenerative changes by placing altered loads on regions of the articular cartilage that were previously conditioned for different load levels. The results suggest that the ipsilateral trunk lean should not be considered and recommended as unloading mechanism for the hip joint on its own but also as a potential increased joint loading of the lateral knee compartment. Therefore, an acceptable therapy concept for limping patients should aim for an inconspicuous gait pattern with a reduced trunk movement.

PMID: 24387803 [PubMed - as supplied by publisher]

6. J Orthop Res. 2013 Dec 23. doi: 10.1002/jor.22567. [Epub ahead of print]

Foot and ankle joint movements inside orthoses for children with spastic CP.

Liu XC, Embrey D, Tassone C, Klingbeil F, Marquez-Barrientos C, Brandsma B, Lyon R, Schwab J, Tarima S, Thometz J.

We compared the ankle joint and foot segment kinematics of pediatric cerebral palsy (CP) participants walking with and without orthoses. A six segment foot model (6SF) was used to track foot motion. Holes were cut in the study orthoses so that electromagnetic markers could be directly placed on the skin. The Hinged Ankle Foot Orthoses (HAFO) allowed a significant increase in ankle dorsiflexion as compared to the barefoot condition during gait, but significantly constrained sagittal forefoot motion and forefoot sagittal range of motion (ROM) ($p<0.01$), which may be detrimental. The Solid Ankle Foot Orthoses (SAFO) constrained forefoot ROM as compared to barefoot gait ($p?<0.01$). The 6SF model did not confirm that the SAFO can control excessive plantarflexion for those with severe plantarflexor spasticity. The supramalleolar orthosis (SMO) significantly ($p<0.01$) constrained forefoot ROM as compared to barefoot gait at the beginning and end of the stance phase, which could be detrimental. The SMO had no effects observed in the coronal plane.

PMID: 24375587 [PubMed - as supplied by publisher]

7. Indian J Anaesth. 2013 Nov;57(6):596-8. doi: 10.4103/0019-5049.123334.

Anaesthetic management in a child with an atypical triad for reconstructive scoliosis surgery.

Singh J, Kapoor D, Srivastava M, Singh M.

Scoliosis may be of varied aetiology and may be associated with severe congenital anomalies. It often poses a challenge in its anaesthetic management. We present anaesthetic management of a child who underwent scoliosis reconstruction with a rare triad of cerebral palsy, glucose-6-phosphate dehydrogenase deficiency and severe mitral regurgitation. Anaesthetic management in these patients should focus primarily on associated co-morbidities and congenital anomalies affecting the course of the perioperative management and thereafter comprehensive pre-operative strategies must be executed to enhance the safety profile during the surgery.

PMID: 24403621 [PubMed] PMCID: PMC3883396 Free PMC Article

8. Turk J Pediatr. 2013 Sep-Oct;55(5):519-23.

Electrophysiologic assessment of spasticity in children using H-reflex.

Tekgül H, Polat M, Tosun A, Serdaroglu G, Gökben S.

We investigated a possible correlation between Hoffmann's reflex (H-reflex) and the Modified Ashworth Scale (MAS) in children with spasticity. H-reflex latencies, amplitudes (H amplitude), Hmax/Mmax amplitude, and MAS were simultaneously measured in 30 children who had bilateral spasticity on the lower extremities. Children with MAS scores of 1 and +1 composed Group I (n=11), and children with MAS scores of 2 and 3 composed Group II (n=26) and Group III (n=23), respectively. The H-reflex latencies were significantly shorter and Hmax/Mmax ratios were significantly higher in patients with cerebral palsy than controls irrespective of the degree of the MAS. The H-reflex latencies in patients with MAS of 1 or +1 were significantly longer than in patients with MAS of 2. Other than between these two groups for H-reflex latencies, no significant differences were revealed among the three different MAS groups for either H-reflex latencies or Hmax/Mmax ratios. There is a positive correlation between spasticity assessed by MAS and H-reflex. We concluded that the H-reflex is a reliable electrophysiologic test for assessment of spasticity in children.

PMID: 24382533 [PubMed - in process] Free full text

9. Dev Med Child Neurol. 2014 Jan 4. doi: 10.1111/dmcn.12375. [Epub ahead of print]

Are we being too 'selective' about motor control?

Fowler E, Staudt L.

PMID: 24387736 [PubMed - as supplied by publisher]

10. Res Dev Disabil. 2013 Dec 23;35(2):506-511. doi: 10.1016/j.ridd.2013.11.028. [Epub ahead of print]

Functionality level and its relation to postural control during sitting-to-stand movement in children with cerebral palsy.

Pavão SL1, Dos Santos AN2, de Oliveira AB2, Rocha NA2.

In this study we studied functional performance and functional balance in children with cerebral palsy (CP) and typically developing (TD) children. The relationship between these components and postural control during sit-to-stand movement (STS) was also investigated. Ten children with CP (GMFCS I and II) and 27 TD children, ages 5-12 years, were included in the study. The Pediatric Evaluation of Disability Inventory (PEDI) and the Pediatric Balance Scale (PBS) were used to measure functional performance and functional balance, respectively. Postural control during STS was assessed by means of a force plate. Participants were asked to stand from a chair with feet over a force plate. Children with CP exhibited lower scores than TD children in the PBS and in the mobility

Functional Skills and Caregiver Assistance domains of the PEDI (p=0.05). In both groups postural control during STS movement was correlated with mobility Caregiver Assistance scores of the PEDI. The results demonstrate that although the participants had mild to moderate motor impairment, they exhibit deficits in their level of functional performance and functional balance compared to typical children. Moreover, it was observed that impairments in postural control during the STS movement are related to functional performance in both groups. This result demonstrates the importance of the structure and function components to the level of activity in children.

PMID: 24374603 [PubMed - as supplied by publisher]

11. Proc Natl Acad Sci U S A. 2013 Nov 12;110(46):18343. doi: 10.1073/pnas.1319310110.

Brain-machine interface.

Nair P.

PMID: 24222678 [PubMed - indexed for MEDLINE] PMCID: PMC3831969 Free PMC Article

12. Arch Phys Med Rehabil. 2014 Jan 6. pii: S0003-9993(14)00003-3. doi: 10.1016/j.apmr.2013.12.019. [Epub ahead of print]

Occurrence of adverse events in chronic intrathecal baclofen infusion: a one-year follow-up study of 158 adults.

Borrini L1, Bensmail D2, Thiebaut JB3, Hugeron C4, Rech C4, Jourdan C2.

OBJECTIVE: To assess the frequency and types of adverse events (AEs) related to intrathecal baclofen (ITB) therapy in adults, and associated risk factors. DESIGN: A prospective observational cohort study of adults followed from 1st January to 31st December 2010. SETTING: A neurological rehabilitation department in a university hospital. PARTICIPANTS: All consecutive adult subjects (n = 158) receiving ITB via a pump, implanted or followed during the study period. INTERVENTION: Not applicable. MAIN OUTCOME MEASURE: Frequency and type of AEs. RESULTS: 158 subjects were followed for ITB therapy in 2010. 128 were implanted prior to this ("non-surgical" subjects), 30 underwent implantation in 2010 ("surgical subjects"), with 20 "newly implanted" and 10 "replacements". Most frequent pathologies were spinal cord injury (42%) and multiple sclerosis (28%). Twenty-eight subjects (18%) experienced a total of 38 AEs. The rate of AEs was 0.023 per month of ITB treatment. AEs were related to the surgical procedure in 53% of cases, to the device in 29% (predominantly catheter dysfunctions) and to side effects of baclofen in 18%. AEs related to the surgical incision (scar complications and collections) were more frequent in "replacement" than "newly-implanted" subjects (p=0.009). No significant association between occurrence of an AE and subject characteristics (age, gait capacity, spinal vs. cerebral spasticity and duration of ITB therapy follow-up) was found. Nearly half of the AEs were serious, extending admission time by a mean 16 days. No AE induced long-term morbidity or death. CONCLUSION: AE rate was relatively low in this cohort. This has to be balanced against the clinical, functional and quality of life improvements, which are expected from ITB therapy.

PMID: 24407102 [PubMed - as supplied by publisher]

13. J Neurosurg Pediatr. 2014 Jan 3. [Epub ahead of print]

Analysis of complications in 430 consecutive pediatric patients treated with intrathecal baclofen therapy: 14-year experience.

Motta F, Antonello CE.

Object: This single-center study investigated adverse events that occurred in children and adolescent patients

treated with intrathecal baclofen (ITB) therapy for spasticity and/or dystonia. Methods In a 14-year period, 430 consecutive patients with a mean age of 13.3 ± 5.9 years received ITB over a mean follow-up period of 8.6 ± 3.8 years (range 12 months to 14 years). Eighty-nine percent of these patients had cerebral palsy. Major complications, defined as those that required a surgical intervention, were infections, CSF leaks, and device problems related to the catheter or pump. Assessing infections, the authors compared the 2 groups of patients implanted with an ITB system by either the subcutaneous or subfascial technique. The temporal distribution of events related to the catheter was also considered. Results At least 1 complication was present in 25% of the patients: 9.3% experienced an infection, 4.9% a CSF leak, 15.1% a problem with the catheter, and 1% a problem related to the pump. Five percent of the assessed patients suffered more than 1 complication. The rate of infections was significantly lower ($p < 0.001$) in patients with the pump placed subfascially compared with those with the pump placed subcutaneously. A higher rate of infection was found after pump replacement compared with the first pump implantation (10.6% vs 6%, respectively). Catheter problems were the most common complication and occurred more frequently during the 1st year after the implant. Conclusions While ITB is an effective treatment to manage spasticity of different origins, adverse events may occur and need to be managed. The surgical procedure should be meticulous and different techniques may have a diverse impact on the infection rate, which is the most critical complication. Despite the adverse events that occurred in this study, the majority of patients were satisfied with the treatment received.

PMID: 24404968 [PubMed - as supplied by publisher]

14. J Neural Transm. 2014 Jan 10. [Epub ahead of print]

Spasticity treatment with onabotulinumtoxin A: data from a prospective German real-life patient registry.

Schramm A, Ndayisaba JP, Auf dem Brinke M, Hecht M, Herrmann C, Huber M, Lobsien E, Mehnert S, Reuter I, Stenner A, van der Ven C, Winterholler M, Kupsch A, Wissel J.

This study aimed at providing real-life baseline, injection and outcome data for the treatment of various forms of spasticity with onabotulinumtoxin A in Germany. Prospective data were collected in an open multicenter patient registry from 2005 until 2010, encompassing the experience of ten specialized German centers in the treatment of spasticity using onabotulinumtoxin A in 508 patients with a total of 2005 treatment sessions. Disease entities comprised spasticity following stroke (both ischemic and hemorrhagic), traumatic brain injury, multiple sclerosis, cerebral palsy, and anoxia. Sustained improvement was observed in a variety of outcome parameters including goal attainment and motor performance scores for up to five repeated injection sessions. No significant differences between disease entities or between upper and lower limb treatment were observed with regard to efficacy and safety following onabotulinumtoxin A treatment. Minor to moderate side effects were reported in <1 % of the study population. We conclude that repetitive treatment of focal and multifocal spasticity with onabotulinumtoxin A provides a safe and efficacious therapeutic strategy for patients with different disease entities of the central nervous system.

PMID: 24407377 [PubMed - as supplied by publisher]

15. J Phys Ther Sci. 2013 Dec;25(12):1633-5. doi: 10.1589/jpts.25.1633. Epub 2014 Jan 8.

Differences of the Truncal Expansion and Respiratory Function between Children with Spastic Diplegic and Hemiplegic Cerebral Palsy.

Kwon YH1, Lee HY2.

Purpose: We attempted to determine whether differences of respiratory function could be found in terms of truncal expansion, respiratory muscle strength, and pulmonary function test (PFT) between children with spastic diplegic and hemiplegic cerebral palsy. Subjects and Methods: We recruited 19 children with spastic diplegic CP (diplegic-CP group) and 10 children with spastic hemiplegic CP (hemiplegic-CP group). For all the children, clinical factors associated with respiratory functions were assessed in terms of truncal expansion (chest and waist expansion), respiratory muscle strength (maximal inspiration and expiration pressures: MIP and MEP), and pulmonary function test (FVC, FEV1, and FEV1/FVC). Results: Overall, the diplegic-CP group showed lower truncal circumference, respiratory muscle strength, and pulmonary function values than the hemiplegic-CP group. However, in the comparison of the two groups significant differences were only found in waist expansion, MIP, MEP, FVC, and

FEV1. Conclusion: The results of this study indicate that children with diplegic CP have much poorer waist expansion, weaker respiratory muscle, and lower pulmonary function values. These findings will provide valuable information for use in the clinical assessment and treatment of children with spastic CP.

PMID: 24409037 [PubMed] PMCID: PMC3885856 Free PMC Article

16. Clin Respir J. 2014 Jan 9. doi: 10.1111/crj.12103. [Epub ahead of print]

Cardiopulmonary morbidity of streptococcal infections in a PICU.

Hon KL, Fu A, Leung TF, Poon TC, Cheung WH, Fong CY, Ho YT, Lee TY, Ng TM, Yu WL, Cheung KL, Lee V, Ip M.

AIM: The streptococci are important bacteria which cause serious childhood infections. We investigated cardiopulmonary morbidity associated with streptococcal infection and pediatric intensive care unit (PICU) admission. METHODS: A retrospective study between 2002 and 2013 of all children with a laboratory isolation of Streptococcus. RESULTS: There were 40 (2.3%) PICU patients with streptococcal isolations including Streptococcus pyogenes (Group A streptococcus, GAS, n=7), Streptococcus agalactiae (Group B streptococcus, GBS, n=5), Streptococcus pneumoniae (SP, n=20), alpha-hemolytic (n=4), beta-hemolytic (n=2) and gama-hemolytic (n=2) streptococci. Comparing among GAS, GBS and SP, respiratory isolates were more likely positive for GAS or SP (p=0.023), whereas cerebrospinal fluid was more likely positive for GBS (p=0.002). All GAS and GBS and the majority of SP (90%) were sensitive to penicillin. All SP specimens were sensitive to cefotaxime and vancomycin. These infections were associated with high PICU mortality of 43%, 20%, 25%, respectively. Isolation of streptococci was associated with a 30% mortality, and high rates of need for mechanical ventilatory and inotropic supports. Patients with GAS, SP or any streptococcal isolation had odds of PICU deaths of 12.3 (p=0.0011), 5.96 (p=0.0008) and 12.0 (p<0.0001), respectively. In SP, older children had significantly higher prevalence of premorbid conditions such as malignancy, mental retardation/cerebral palsy (MRCP)+/-seizure disorders, chromosomal or genetic disorders (p=0.003) than children < 5 years of age. Serotypes were available for some of these specimens which included 19A, 19F, 6B, 3 and 6C. There were 4 SP deaths with multi-organ system failure and hemolytic uremic syndrome (two 19A, and two serotype 3). CONCLUSIONS: Severe streptococcal infections are associated with significant morbidity and mortality despite treatment with systemic antibiotics and ICU support. GAS and SP affect the lungs of children whereas GBS more likely causes meningitis in infants. The expanded coverage of newer polyvalent pneumococcal vaccines can probably prevent infections by serotypes 19A, 19F, 6B and 3. This article is protected by copyright. All rights reserved.

PMID: 24406041 [PubMed - as supplied by publisher]

17. Ann Vasc Dis. 2013;6(4):694-701. doi: 10.3400/avd.oa.13-00090. Epub 2013 Nov 15.

Deep vein thrombosis in patients with severe motor and intellectual disabilities.

Ohmori H1, Ochi F2, Tanuma N3, Ohnuki E4, Yamasaki M4, Takesue H5, Kan M6, Matsumoto N7, Sumimoto R8, Harada A4.

Most patients with severe motor and intellectual disabilities (SMID) have restricted mobility capability and have been bedridden for long periods because of paralysis of the extremities caused by abnormal muscular tonicity due to cerebral palsy and developmental disabilities, and such patients are associated with a high risk for the complications of deep vein thrombosis (DVT). Here, we report 8 patients (34.8%) with DVT among 23 patients with SMID during prolonged bed rest. However, we did not detect thrombosis in the soleal veins, finding it mostly in the superficial femoral and common femoral veins. Regarding laboratory data for the coagulation system, there were no cases with D-dimer above 5 μg/ml. Concerning sudden death in patients with SMID, we have to be very careful of the possibility of pulmonary thromboembolism due to DVT. Therefore, we should consider the particularities of an underdeveloped vascular system from underlying diseases for the evaluation of DVT in patients with SMID. A detailed study of DVT as a vascular complication is very important for smooth medical care of SMID and compression Doppler ultrasonography of the lower extremities, as noninvasive examination, is very helpful. (English translation of Jpn J Phlebol 2012; 23: 17-24).

PMID: 24386017 [PubMed] PMCID: PMC3866357 Free PMC Article

18. Spec Care Dentist. 2014 Jan;34(1):51-3. doi: 10.1111/scd.12016. Epub 2013 Feb 28.

Oral myiasis: a case report.

Zachariah JE, Sehgal K, Dixit UB, Bhatia R.

Myiasis is a condition caused by the invasion of tissues by larvae of Diptera flies. This phenomenon is well documented in the skin especially among animals and people in tropical and subtropical areas. The condition causes extensive tissue destruction as the larvae, at least for a certain period, feed on the host's dead or living tissue, liquid body substances, or ingested food. Mouth breathing during sleep, poor oral hygiene, alcoholism, senility, mental disability, cerebral palsy, and hemiplegia may facilitate the development of myiasis. We present a case report of oral myiasis in a 22-year-old male with cerebral palsy and severe mental retardation treated successfully by manual removal of the larvae by topical application of turpentine oil and oral systemic therapy with ivermectin.

PMID: 24382372 [PubMed - in process]

19. Mil Med. 2014 Jan;179(1):105-10. doi: 10.7205/MILMED-D-13-00304.

Epilepsy at a summer Camp for children and young adults with developmental disabilities: a 3-year experience.

Bandino ML, Garfinkle RA, Zickefoose BA, Hsieh DT.

The comprehensive care of children with epilepsy involves not only the treatment of seizures but also enhancement of their quality of life. Children with developmental disabilities are often unable to attend traditional summer camps because of safety concerns, as their prevalence of epilepsy is high and tends to be more severe. The goal of the current study is to describe our epilepsy experience at a summer camp adapted for children with developmental disabilities, with which the U. S. military has had a long-standing relationship. A retrospective chart review of all children and young adults attending summer sessions between 2008 and 2010 was performed. A total of 1,526 camp sessions were attended by 818 campers (mean 13.7 years), with 32.3% of campers having epilepsy. Of campers with epilepsy, 46.6% had cerebral palsy, 57.6% intellectual disability, and 28.8% autism spectrum disorders. Seizure frequency was at least weekly in 21.2% and at least daily in 13.3%. A history of status epilepticus was reported in 34.9%. There were seven camp infirmary visits because of seizures (incidence 1.4%), including two for status epilepticus. Thus, despite a high prevalence of severe epilepsy, in the setting of appropriate safety precautions, a safe camp experience can be provided, as seizure-related complications are rare.

PMID: 24402994 [PubMed - in process]

20. Dev Med Child Neurol. 2014 Jan 7. doi: 10.1111/dmcn.12374. [Epub ahead of print]

Everyday psychological functioning in children with unilateral cerebral palsy: does executive functioning play a role?

Whittingham K, Bodimeade HL, Lloyd O, Boyd RN.

AIM: To identify whether executive functioning mediates the effect of having unilateral cerebral palsy (CP) on executive functioning in everyday life, psychological functioning, and social functioning. METHOD: A cross-sectional cohort of 46 children with unilateral CP (25 males, 21 females; mean age 11y 1mo, SD 2y 5mo; 24 right-sided, 22 left-sided) and 20 children with typical development (nine males, 11 females; mean age 10y 10mo, SD 2y 4mo). Cognitive executive functioning was tested using a neuropsychological battery. Executive functioning in everyday life was measured with the Behavior Rating Inventory of Executive Function (BRIEF; teacher and parent reports) and psychological and social functioning by the Strengths and Difficulties Questionnaire (SDQ). Analysis included analysis of covariance and bootstrapping. RESULTS: Children with unilateral CP were found to have

significantly decreased functioning, compared with children with typical development, on the BRIEF Behavioral Regulation Index, the BRIEF Metacognition Index, and on the SDQ emotion, conduct, hyperactivity, and peer problems subscales. Group differences were mediated by cognitive executive functioning for the BRIEF Metacognition Index (teacher and parent report), the BRIEF Behavioral Regulation Index (parent report only), the SDQ conduct subscale, and the SDQ hyperactivity subscale. INTERPRETATION: This study suggests that the increased risk of children with unilateral CP experiencing executive functioning difficulties in everyday life, conduct problems, and hyperactivity can be partly explained by decreased cognitive executive functioning abilities relative to children with typical development.

PMID: 24392947 [PubMed - as supplied by publisher]

21. Neurol Res. 2014 Jan;36(1):92-4. doi: 10.1179/1743132813Y.0000000290.

Cerebral palsy risk factors and their impact on psychopathology.

Levy-Zaks A, Pollak Y, Ben-Pazi H.

Objective: We examined whether the type of brain injury impacts the psychopathological profile and quality of life in children with cerebral palsy (CP). Methods: We assessed 18 children with CP [9 premature, 9 asphyxia at term] and 16 siblings using parent forms of the child behavior checklist (CBCL), disruptive behavior disorder rating scale (DBDRS), and pediatric quality of life inventory (PEDSQL). Results: Children with CP demonstrated more emotional and behavioral symptoms (depression, anxiety, and social, thought, and attention problems) and lower quality of life than their siblings. The pathopsychological profile of children with CP due to prematurity and asphyxia was similar. Conclusion: Etiology does not impact the psychopathology in children with CP.

PMID: 24405229 [PubMed - in process]

22. Ceylon Med J. 2013 Dec;58(4):162-7. doi: 10.4038/cmj.v58i4.5617.

The development and validation of an instrument to assess caregiver burden in cerebral palsy: Caregiver Difficulties Scale.

Wijesinghe CJ, Fonseka P, Hewage CG.

OBJECTIVES: To develop a valid and reliable instrument to assess caregiver burden in caregivers of children with cerebral palsy (CP). METHODS: A self-administered, multidimensional instrument - Caregiver Difficulties Scale (CDS) - was developed using a combined qualitative-quantitative approach. Items for the preliminary draft were selected from existing caregiver assessment instruments by consensus of experts or key informant interviews with caregivers and service providers of children with CP. Standard item reduction techniques based on responses of 50 caregivers were used to develop the 25 item final draft of CDS. Multidimensionality of CDS was established by exploratory factor analysis, using responses of 125 caregivers. Construct validity of CDS was confirmed by assessing correlations between CDS score and two other constructs: 'Caregiver quality of life' and 'Severity of disease in the care recipient' in a sample of 90 caregivers. Internal consistency and reliability of CDS were assessed using Cronbach's alpha and testretest reliability. RESULTS: A new instrument (CDS) was developed with four subscales measuring caregiver's concerns for child, impact on self, support for caregiving and social and economic strain. Face validity, content validity and consensual validity of CDS was established through the process of item generation. Caregiver quality of life and severity of disease in care recipient demonstrated significant moderate to high correlations (r = 0.3) with scores of CDS, confirming construct validity. Both internal consistency and reliability of CDS were satisfactory. CONCLUSIONS: CDS is a valid and reliable instrument to assess caregiver burden among caregivers of children with cerebral palsy in Sri Lanka.

PMID: 24385058 [PubMed - in process] Free full text

23. Dev Med Child Neurol. 2014 Jan 3. doi: 10.1111/dmcn.12354. [Epub ahead of print]

The development of social strengths in children with cerebral palsy.

Adolfsson M.

PMID: 24383413 [PubMed - as supplied by publisher]

24. Res Dev Disabil. 2013 Dec 26;35(2):520-528. doi: 10.1016/j.ridd.2013.12.002. [Epub ahead of print]

Determinants of quality of life in children with cerebral palsy: A comprehensive biopsychosocial approach.

Chen KL1, Tseng MH2, Shieh JY3, Lu L3, Huang CY4.

This study investigated the determinants of quality of life (QOL) of children with cerebral palsy (CP) considering possible variables comprehensively from a biopsychosocial perspective by adopting the International Classification of Functioning, Disability and Health (ICF) and using a CP-specific QOL questionnaire. A total of 167 children with CP (mean age 9.06 years, SD 2.61 years) and their caregivers participated in this study. Children's QOL was measured by the Cerebral Palsy Quality of Life for Children (CP QOL-Child) - primary caregiver proxy-report form. The potential determinants of QOL were collected based on all ICF dimensions. Results of seven multiple regression models showed that the determinants of QOL in children with CP were multidimensional and biopsychosocial in nature, i.e., encompassing the domains of health condition, body functions and structures, and contextual factors of the ICF. Children's behavioral and emotional problems as well as caregiver's psychological and family-related factors were important determinants of QOL in children with CP. Knowledge of the determinants of QOL could serve as a guide in a holistic approach to evaluation and intervention targeted at these determinants to improve the QOL of children with CP.

PMID: 24374895 [PubMed - as supplied by publisher]

25. Narrat Inq Bioeth. 2011;1(1):43-54. doi: 10.1353/nib.2011.0001.

Perspectives of adolescents and young adults with cerebral palsy on the ethical and social challenges encountered in healthcare services.

Larivière-Bastien D, Majnemer A, Shevell M, Racine E.

Healthcare is a context where individuals with disability confront important ethical and social challenges. Adolescents and young adults with cerebral palsy (CP) seem to face additional challenges but we have little insight into their perspectives. This qualitative study aimed to identify and better understand such challenges. We interviewed 14 participants with CP aged 18 to 25. Participants described a range of challenges experienced when using health services, including: lack of long-term follow-up, shortcomings in physical access to infrastructures, and situations of injustice. Challenges specific to medical consultations were reported (e.g., rude attitudes, belittlement, inadequate communication, lack of consideration). We discuss and explain further that: (1) the ethical principle of respect for persons needs to be concretely specified to improve current practices; (2) respect for autonomy calls for further direct empowerment of individuals with CP and, (3) gaps in dedicated healthcare resources for CP and the long-term needs associated should be addressed.

PMID: 24406529 [PubMed - in process]

26. Perspect Public Health. 2014 Jan 9. [Epub ahead of print]

Addressing the inverse care law: the role of community paediatric services.

Rahman FR, Maharaj V, Yates R, Beeley C, Moore I, Rose A, Counsell A.

Background: Children's health suffers disproportionately from the effects of poverty. The inverse care law states that those who need care the most are the least likely to receive it. Community paediatricians are well placed to address health inequalities in children.Aims:To explore, using routinely collected data, whether we address health inequalities and the inverse care law, particularly for certain conditions targeted by our specialty. Methods: Five years of data were analysed, during which health equity audits have led to service changes in order to tackle inequities. The data include postcodes, allowing each child to be assigned to a deprivation quintile, and a range of diagnoses, including five sentinel conditions: attention deficit hyperactivity disorder (ADHD) on medication, autistic spectrum disorder (ASD), epilepsy, cerebral palsy and Down's syndrome. This allowed analysis of the caseload by deprivation index for these conditions, comparison with the background population and exploration of time trends. Results:The number of children on the caseload and their distribution across the quintiles remained stable. The proportion of deprived children (i.e. in the lowest two quintiles) on the caseload over the last five years taken together is 56%, compared to 44% in the background population. The numbers of children with ADHD on medication has almost quadrupled in deprived quintiles and doubled in the least deprived quintile, while the numbers of children with this diagnosis in the most deprived is four times that in the least deprived. Numbers of children with ASD have also increased in each quintile. In contrast, the number of children with epilepsy and cerebral palsy did not show much variation, but those from deprived quintiles made up a greater proportion of the caseload. Conclusions: Routine data collection demonstrates that inequalities are addressed using all four quality domains of service provision and sentinel conditions more likely to affect deprived children are targeted. We believe it is possible for all services to collect and analyse data thus with minimal effort, thereby providing a foundation from

PMID: 24406636 [PubMed - as supplied by publisher]

27. Occup Ther Int. 2014 Jan 6. doi: 10.1002/oti.1362. [Epub ahead of print]

Assessment of Knowledge of Iranian Occupational Therapists of Handling of Children with Cerebral Palsy.

Rezaei M, Malekpour M, Rassafiani M.

The purpose of this study was to assess the knowledge of Iranian occupational therapists regarding the handling of children with cerebral palsy and the application of their knowledge into practice. A questionnaire with two scales of a self-report and a knowledge-based test was designed. Data were analysed by using descriptive statistics and Spearman correlation. Of 77 participants, 64.9% participants reported their knowledge of handling at moderate, 14.3% at low and 6.5% at very low level. The result of the test showed that 57.1% participants had knowledge at moderate and 16.9% at low level. Toileting and bathing are the least focused areas by occupational therapists in teaching handling techniques to caregivers. These results suggest that the participants need further training to increase their knowledge in the various areas of handling and positioning techniques especially toileting and bathing. Because participants were from one area of Iran, future research could include a larger population of occupational therapists. Copyright © 2014 John Wiley & Sons, Ltd.

PMID: 24390931 [PubMed - as supplied by publisher]

28. Vaccine. 2014 Jan 5. pii: S0264-410X(13)01787-8. doi: 10.1016/j.vaccine.2013.12.044. [Epub ahead of print]

Timeliness of routine immunization in a population-based Italian cohort of very preterm infants: Results of the ACTION follow-up project.

Tozzi AE1, Piga S2, Corchia C3, Di Lallo D4, Carnielli V5, Chiandotto V6, Fertz MC7, Miniaci S8, Rusconi F9, Cuttini M2.

BACKGROUND: Although very preterm infants are recommended to receive immunizations, according to their chronological age, immunization start in these infants is often delayed. Aim To measure coverage and timeliness of routine immunizations in Italian very preterm infants and to assess determinants of delay. METHODS: We followed up infants 22-31 completed weeks of gestational age discharged from intensive care. We measured the proportion of children with one dose of diphtheria-tetanus-pertussis-poliohepatitis, B-Hib vaccine (DTP-Pol-HBV-Hib), measles -mumps-rubella vaccine (MMR), conjugate pneumococcal vaccine (Pnc), conjugate meningococcal C vaccine (MenC), and varicella vaccine (Var) by 24 months. We used the Kaplan Meier method and Cox proportional hazard models to estimate the age, at immunization start and determinants of timeliness for each vaccine. RESULTS: Data on 1102 (92.1%) children out of 1196 included in the cohort were analyzed. Immunization start by 24 months of age occurred in 95.9% of children for DTP-Pol-HBV-Hib; 84.0% for MMR; 49.7% for Pnc; 38.5% for MenC; and 4.1% for Var. Eighty-seven percent of participants received the first dose of DTP-Pol-HBV-Hib by 6 months of age, and 66.7% had their first MMR administered by 18 months. Hospitalization was associated with delay for all vaccines with the exception of MenC and Var. Maternal employment was associated with earlier immunization for MMR, Pnc, and MenC. DTP-Pol-HBV-Hib timeliness improved with increasing birthweight and paternal employment and decreased with a larger number of siblings in the household. MMR was delayed in children with cerebral palsy, and in those with a larger number of children in the household. Immunization for Pnc was delayed in children with larger number of siblings. CONCLUSIONS: Immunization start for all vaccines was considerably delayed in many very preterm infants. Public health strategies taking into account determinants of delay should be implemented to improve coverage and timeliness of vaccination in this group of infants.

PMID: 24397902 [PubMed - as supplied by publisher]

Prevention and Cure

29. J Pediatr. 2013 Dec 31. pii: S0022-3476(13)01471-6. doi: 10.1016/j.jpeds.2013.11.036. [Epub ahead of print]

Feasibility of Autologous Cord Blood Cells for Infants with Hypoxic-Ischemic Encephalopathy.

Cotten CM1, Murtha AP2, Goldberg RN3, Grotegut CA2, Smith PB3, Goldstein RF3, Fisher KA3, Gustafson KE4, Waters-Pick B5, Swamy GK2, Rattray B3, Tan S6, Kurtzberg J7.

OBJECTIVE: To assess feasibility and safety of providing autologous umbilical cord blood (UCB) cells to neonates with hypoxic-ischemic encephalopathy (HIE). STUDY DESIGN: We enrolled infants in the intensive care nursery who were cooled for HIE and had available UCB in an open-label study of non-cyropreserved autologous volume- and red blood cell-reduced UCB cells (up to 4 doses adjusted for volume and red blood cell content, 1-5 × 107 cells/dose). We recorded UCB collection and cell infusion characteristics, and pre- and post-infusion vital signs. As exploratory analyses, we compared cell recipients' hospital outcomes (mortality, oral feeds at discharge) and 1-year survival with Bayley Scales of Infant and Toddler Development, 3rd edition scores =85 in 3 domains (cognitive, language, and motor development) with cooled infants who did not have available cells. RESULTS: Twenty-three infants were cooled and received cells. Median collection and infusion volumes were 36 and 4.3 mL. Vital signs including oxygen saturation were similar before and after infusions in the first 48 postnatal hours. Cell recipients and concurrent cooled infants had similar hospital outcomes. Thirteen of 18 (74%) cell recipients and 19 of 46 (41%) concurrent cooled infants with known 1-year outcomes survived with scores >85. CONCLUSIONS: Collection, preparation, and infusion of fresh autologous UCB cells for use in infants with HIE is feasible. A randomized double-blind study is needed.

PMID: 24388332 [PubMed - as supplied by publisher]

30. Scientific World Journal. 2013 Dec 9;2013:354218. doi: 10.1155/2013/354218.

Achieving motor development milestones at the age of three months may determine, but does not guarantee, proper further development.

Gajewska E1, Sobieska M2, Kaczmarek E3, Suwalska A4, Steinborn B5.

Proper motor performance at 3rd month is necessary for further motor development. The paper aims to demonstrate the reliability, sensitivity, and predictive value of an original motor performance assessment tool in comparison with the neurological assessment at 3, 6, and 9 months. Children (n = 123), born at term without pre- or perinatal complications, born at term with pre- or perinatal complications, or born preterm, were assessed at the age of 3, 6, and 9 months, by a neurologist and a physiotherapist. The physiotherapist evaluated 15 qualitative features typical for the age of 3 months in the prone and supine positions. The final neurological assessment determined the degree of developmental disorder. Neurological and global physiotherapeutic assessments showed a statistically significant correlation. Qualitative assessment results were very good in healthy children and decreased with worsening neurological diagnoses. Children diagnosed with cerebral palsy did not show proper qualitative features of 3 months when analyzed at 3, 6, and 9 months. Children with delayed motor development revealed minor qualitative performance impairments as early as 3 months but improved with age. Qualitative assessment at 3 months not only facilitates diagnosis of major developmental disorders but is also a good predictor of delayed motor development in children.

PMID: 24385875 [PubMed - in process] PMCID: PMC3872422 Free PMC Article

31. JAMA Pediatr. 2013 Dec 30. doi: 10.1001/jamapediatrics.2013.4248. [Epub ahead of print]

Chorioamnionitis and Early Childhood Outcomes Among Extremely Low-Gestational-Age Neonates.

Pappas A1, Kendrick DE2, Shankaran S1, Stoll BJ3, Bell EF4, Laptook AR5, Walsh MC3, Das A6, Hale EC3, Newman NS7, Higgins RD8; for the Eunice Kennedy Shriver National Institute of Child Health and Human Development Neonatal Research Network.

IMPORTANCE Chorioamnionitis is strongly linked to preterm birth and neonatal infection. The association between histological and clinical chorioamnionitis and cognitive, behavioral, and neurodevelopmental outcomes among extremely preterm neonates is less clear. We evaluated the impact of chorioamnionitis on 18- to 22-month neurodevelopmental outcomes in a contemporary cohort of extremely preterm neonates. OBJECTIVE To compare the neonatal and neurodevelopmental outcomes of 3 groups of extremely low-gestational-age infants with increasing exposure to perinatal inflammation: no chorioamnionitis, histological chorioamnionitis alone, or histological plus clinical chorioamnionitis. DESIGN, SETTING, AND PARTICIPANTS Longitudinal observational study at 16 centers of the Eunice Kennedy Shriver National Institute of Child Health and Human Development Neonatal Research Network. Two thousand three hundred ninety extremely preterm infants born at less than 27 weeks' gestational age (GA) between January 1, 2006, and December 31, 2008, with placental histopathology and 18 to 22 months' corrected age follow-up data were eligible. MAIN EXPOSURE Chorioamnionitis. MAIN OUTCOMES AND MEASURES Outcomes included cerebral palsy, gross motor functional limitation, behavioral scores (according to the Brief Infant-Toddler Social and Emotional Assessment), cognitive and language scores (according to the Bayley Scales of Infant and Toddler Development, Third Edition), and composite measures of death/neurodevelopmental impairment. Multivariable logistic and linear regression models were developed to assess the association between chorioamnionitis and outcomes while controlling for important variables known at birth. RESULTS Neonates exposed to chorioamnionitis had a lower GA and higher rates of early-onset sepsis and severe periventricular-intraventricular hemorrhage as compared with unexposed neonates. In multivariable models evaluating death and neurodevelopmental outcomes, inclusion of GA in the model diminished the association between chorioamnionitis and adverse outcomes. Still, histological plus clinical chorioamnionitis was associated with increased risk of cognitive impairment as compared with no chorioamnionitis (adjusted odds ratio [OR], 2.38 [95% CI, 1.32 to 4.28] without GA; adjusted OR, 2.00 [95% CI, 1.10 to 3.64] with GA as a covariate). Histological chorioamnionitis alone was associated with lower odds of death/neurodevelopmental impairment as compared with histological plus clinical chorioamnionitis (adjusted OR, 0.68 [95% CI, 0.52 to 0.89] without GA; adjusted OR, 0.66 [95% CI, 0.49 to 0.89] with GA as a covariate). Risk of behavioral problems did not differ statistically between groups. CONCLUSIONS AND RELEVANCE Antenatal exposure to chorioamnionitis is associated with altered odds of cognitive impairment and death/neurodevelopmental impairment in extremely preterm infants.

PMID: 24378638 [PubMed - as supplied by publisher]

32. Pediatrics. 2014 Jan;133(1):55-62. doi: 10.1542/peds.2013-0372. Epub 2013 Dec 30.

Intraventricular hemorrhage and neurodevelopmental outcomes in extreme preterm infants.

Bolisetty S, Dhawan A, Abdel-Latif M, Bajuk B, Stack J, Lui K; New South Wales and Australian Capital Territory Neonatal Intensive Care Units' Data Collection.

OBJECTIVE: Not many large studies have reported the true impact of lower-grade intraventricular hemorrhages in preterm infants. We studied the neurodevelopmental outcomes of extremely preterm infants in relation to the severity of intraventricular hemorrhage. METHODS: A regional cohort study of infants born at 23 to 28 weeks' gestation and admitted to a NICU between 1998 and 2004. Primary outcome measure was moderate to severe neurosensory impairment at 2 to 3 years' corrected age defined as developmental delay (developmental quotient >2 SD below the mean), cerebral palsy, bilateral deafness, or bilateral blindness. RESULTS: Of the 1472 survivors assessed, infants with grade III-IV intraventricular hemorrhage (IVH; n = 93) had higher rates of developmental delay (17.5%), cerebral palsy (30%), deafness (8.6%), and blindness (2.2%). Grade I-II IVH infants (n = 336) also had increased rates of neurosensory impairment (22% vs 12.1%), developmental delay (7.8% vs 3.4%), cerebral palsy (10.4% vs 6.5%), and deafness (6.0% vs 2.3%) compared with the no IVH group (n = 1043). After exclusion of 40 infants with late ultrasound findings (periventricular leukomalacia, porencephaly, ventricular enlargement), isolated grade I-II IVH (n = 296) had increased rates of moderate-severe neurosensory impairment (18.6% vs 12.1%). Isolated grade I-II IVH was also independently associated with a higher risk of neurosensory impairment (adjusted odds ratio 1.73, 95% confidence interval 1.22-2.46). CONCLUSIONS: Grade I-II IVH, even with no documented white matter injury or other late ultrasound abnormalities, is associated with adverse neurodevelopmental outcomes in extremely preterm infants.

PMID: 24379238 [PubMed - in process]