Cerebral Palsy INSTITUTE

CP Research News

Monday 8 March 2010

Interventions

1. J Bone Joint Surg Br. 2010 Mar;92(3):436-41.

The cerebral palsy hip classification is reliable: an inter- and intra-observer reliability study.

Murnaghan ML, Simpson P, Robin JG, Shore BJ, Selber P, Graham HK.

Hugh Williamson Gait Laboratory, Royal Children's Hospital, Flemington Road, Parkville, Victoria 3052, Australia.

We have tested the reliability of a recently reported classification system of hip morphology in adolescents with cerebral palsy in whom the triradiate cartilage was closed. The classification is a six-grade ordinal scale, based on the measurement of the migration percentage and an assessment of Shenton's arch, deformity of the femoral head, acetabular deformity and pelvic obliquity. Four paediatric orthopaedic surgeons and four physiotherapists received training in the use of the classification which they applied to the assessment of 42 hip radiographs, read on two separate occasions. The inter- and intra-observer reliability was assessed using the intraclass correlation coefficient and found to be excellent, with it ranging from 0.88 to 0.94. The classification in our study was shown to be valid (based on migration percentage), and reliable. As a result we believe that it can now be used in studies describing the natural history of hip displacement in cerebral palsy, in outcome studies and in communication between clinicians.

PMID: 20190318 [PubMed - in process]

2. NeuroRehabilitation. 2009;25(4):235-40.

Assessing the reliability of the Modified Modified Ashworth Scale between two physiotherapists in adult patients with hemiplegia.

Ansari NN, Naghdi S, Hasson S, Fakhari Z, Mashayekhi M, Herasi M.

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The Modified Modified Ashworth Scale (MMAS) is a simple clinical outcome measure to assess muscle spasticity in people with brain injury. The objective of this cross-sectional study was to assess the interrater reliability of the MMAS in the upper limb of adult patients with hemiplegia. Participants were fifteen patients with a mean age of 57.3 +/- 14.4 years. They had brain injury on average 33.3 +/- 26.2 months earlier. Two common spastic muscle groups (elbow flexor and wrist flexor) on the hemiparetic side of the patients were rated by two physiotherapists according to a standardized protocol. The order of raters' assessment and the sequence of muscle testing was randomized. The weighted Kappa (kappaw) values were calculated for reliability. The kappaw was 0.61 for elbow flexor and 0.78 for wrist flexor. Results support the good interrater reliability of the MMAS for persons with upper limb spasticity.

PMID: 20037215 [PubMed - indexed for MEDLINE]

3. Clin Orthop Surg. 2010 Mar;2(1):13-21. Epub 2010 Feb 4.

Extraarticular subtalar arthrodesis for pes planovalgus: an interim result of 50 feet in patients with spastic diplegia.

Yoon HK, Park KB, Roh JY, Park HW, Chi HJ, Kim HW.

Department of Orthopaedic Surgery, Soonchunhyang University Hospital, Soonchunhyang University College of Medicine, Seoul, Korea.

BACKGROUND: There are no reports of the pressure changes across the foot after extraarticular subtalar arthrodesis for a planovalgus foot deformity in cerebral palsy. This paper reviews our results of extraarticular subtalar arthrodesis using a cannulated screw and cancellous bone graft. METHODS: Fifty planovalgus feet in 30 patients with spastic diplegia were included. The mean age at the time of surgery was 9 years, and the mean follow-up period was 3 years. The radiographic, gait, and dynamic foot pressure changes after surgery were investigated. RESULTS: All patients showed union and no recurrence of the deformity. Correction of the abduction of the forefoot, subluxation of the talonavicular joint, and the hindfoot valgus was confirmed radiographically. However, the calcaneal pitch was not improved significantly after surgery. Peak dorsiflexion of the ankle during the stance phase was increased after surgery, and the peak plantarflexion at push off was decreased. The peak ankle plantar flexion moment and power were also decreased. Postoperative elevation of the medial longitudinal arch was expressed as a decreased relative vertical impulse of the medial midfoot and an increased relative vertical impulse (RVI) of the lateral midfoot. However, the lower than normal RVI of the 1st and 2nd metatarsal head after surgery suggested uncorrected forefoot supination. The anteroposterior and lateral paths of the center of pressure were improved postoperatively. CONCLUSIONS: Our experience suggests that the index operation reliably corrects the hindfoot valgus in patients with spastic diplegia. Although the operation corrects the plantar flexion of the talus, it does not necessarily correct the plantarflexed calcaneus and forefoot supination. However, these findings are short-term and longer term observations will be needed.

PMID: 20190996 [PubMed - in process]

4. Dev Med Child Neurol. 2010 Feb 24. [Epub ahead of print]

Correlates of decline in gross motor capacity in adolescents with cerebral palsy in Gross Motor Function Classification System levels III to V: an exploratory study.

Bartlett DJ, Hanna SE, Avery L, Stevenson RD, Galuppi B.

School of Physical Therapy, The University of Western Ontario, London, Ontario, Canada.

Aim: To explore associations between clinical variables and decline in motor capacity in adolescents with cerebral palsy (CP). Method: Participants included 76 males and 59 females, whose mean age at the beginning of the study was 14 years 6 months (SD 2.4, range 11.6-17.9); 51 at Gross Motor Function Classification System (GMFCS) level III, 47 at level IV, and 37 at level V. Ninety-six participants had tetraplegia, 32 had diplegia, and one had hemiplegia. Types of motor disorder were spastic n=98; mixed, n=11; dystonic, n=9; hypotonic, n=7; and ataxic n=3 (seven participants were not classified). Reliable raters collected data annually for 4 years on anthropometric characteristics, the Spinal Alignment and Range of Motion Measure, as well as the Gross Motor Function Measure, 66 items (GMFM-66); participants or their parents reported on health status (using the Health Utilities Questionnaire), pain, and exercise participation (using measures developed for this study). The predicted drop in GMFM-66 scores after childhood was calculated using data on the same children from an earlier study. Correlations were calculated between the drop in GMFM-66 scores and the average and change scores of the clinical variables (the alpha level for statistical significance of this exploratory study was 0.10). Results: The drop in GMFM-66 score was significantly correlated with limitations in range of motion (r=0.42) and spinal alignment (r=0.28), and pain (r=0.16). Increases in triceps skinfold (r=-0.19), mid-arm circumference (r=-0.23), and the ratio of mid-arm circumference to knee height (r=-0.23) were associated with less decline. Interpretation: Preventing range-of-motion limitations and pain experiences and optimizing nutrition might contribute to less decline in the gross motor capacity of adolescents with CP. Further investigation is required to clarify the role other factors that contribute to maintained function over time.

PMID: 20187880 [PubMed - as supplied by publisher]

5. Int J Obstet Anesth. 2010 Mar 2. [Epub ahead of print]

Spinal anaesthesia for caesarean section in a patient with cerebral palsy.

Tanqueray TA, Dob DP.

Chelsea & Westminster Hospital, London UK.

PMID: 20199858 [PubMed - as supplied by publisher]

6. Dev Med Child Neurol. 2010 Mar;52 Suppl 2:1-66.

Abstracts of the 5th Biennial Conference of the Australasian Academy of Cerebral Palsy & Developmental Medicine. March 3-6, 2010. Christchurch, New Zealand.

[No authors listed]

PMID: 20175790 [PubMed - in process]

7. Epileptic Disord. 2010 Mar 1. [Epub ahead of print]

Significance of interictal occipital epileptiform discharges in children.

Wang C, Khurana DS, Kothare SV, Legido A, Harrison G, Carvalho KS, Valencia I.

Department of Neurology, Hahnemann University Hospital, Section of Neurology, St. Christopher's Hospital for Children, Department of Pediatrics, Drexel University College of Medicine, Philadelphia, USA.

Objective. Interictal occipital epileptiform abnormalities have not been well characterized. The objective of this pilot study was to assess their significance in children. Methods. A search was performed on the EEG database for the keywords "occipital", "spike", "sharp wave" and "epileptiform". Patients were divided into two groups based on the absence of all (group 1) or presence of any (group 2) of the following criteria: mental retardation, cerebral palsy, neurological deficits, abnormal MRI and/or intractable epilepsy. Special attention was given to the spike/sharp wave amplitude/duration and background slowing. Results. A total of 44 children (eight months to 15 years) were studied. Groups 1 and 2 were each composed of 22 children. Background slowing was more frequent in group 2 (10/22, 45%) compared to group 1 (1/22, 4.5%; p = 0.002). In group 2, 8/22 (36%) had spikes or sharp waves with amplitudes below 50 muV or above 150 muV with a positive predictive value of 89%, and a negative predictive value of 39%. Only 1/22 (4.5%) in group 1 had epileptiform activity outside of the 50-150 muV range. Conclusions. The presence of very high or low-amplitude occipital epileptiform abnormalities or background slowing may be indicative of encephalopathy.

PMID: 20194082 [PubMed - as supplied by publisher]

8. Health Soc Care Community. 2010 Feb 24. [Epub ahead of print]

To what extent do children with cerebral palsy participate in everyday life situations?

Parkes J, McCullough N, Madden A.

Nursing-Midwifery Research Unit, School of Nursing & Midwifery, Queen's University Belfast, Belfast, UK.

The aims of the study are to describe participation of children with cerebral palsy in everyday life situations, to investigate the relationship between participation (primary outcome variable) with child and parent characteristics

(independent variables) and to compare the frequency of participation (secondary outcome variable) of children with cerebral palsy with children without disabilities. A cross-sectional survey of parents of children with cerebral palsy in Northern Ireland was undertaken in families' homes using standard questionnaires. Children with cerebral palsy born between 31/8/1991 and 1/4/1997 were identified from a case register of people with the condition. A total of 102 parents opted in (51% response rate). Questionnaires included the Life Habits Questionnaire (Life-H) to measure difficulties in participation and The Frequency of Participation Questionnaire (FPQ), to measure frequency of participation with comparative data for children without disability. Overall, children with cerebral palsy participated less often than their non-disabled peers across a number of lifestyle and cultural pursuits. Among the 102 children with cerebral palsy, participation in 'relationships' was the least disrupted area of everyday life and aspects of 'school', 'personal care' and 'mobility' were the most disrupted. Children with cerebral palsy and severe co-impairments were significantly less likely to experience higher levels of participation in most areas of everyday life when compared to children with cerebral palsy and no severe co-impairments. Child physical and psychological well-being did not influence participation although higher parenting stress was significantly related to lower child participation in 'community activities'. Participation is an important health outcome for children with cerebral palsy and should be incorporated in routine clinical practice. Professionals have a role to play both at the level of addressing individual child and family needs as well as influencing legislation and policy to ensure improved access to services and local communities.

PMID: 20201974 [PubMed - as supplied by publisher]

9. J Am Acad Orthop Surg. 2010 Mar;18(3):160-8.

Upper extremity surgery in children with cerebral palsy.

Lomita C, Ezaki M, Oishi S.

Pediatric patients with cerebral palsy present unique challenges. Any treatment regimen must take into account potential growth, possible sequelae of surgery, and, in some cases, significant behavioral issues. Careful evaluation of motor and sensory function of the extremity and of use patterns is imperative because these findings play a critical role in determining the ultimate success of any intervention. Every patient is addressed independently and treatment individualized. The patient and parents must understand that surgery can address only the function or position of the anatomic area. Surgery will not correct the underlying problem.

PMID: 20190106 [PubMed - in process]

10. Dev Med Child Neurol. 2010 Feb 19. [Epub ahead of print]

Importance of peers and dating in the development of romantic relationships and sexual activity of young adults with cerebral palsy.

Wiegerink DJ, Roebroeck ME, van der Slot WM, Stam HJ, Cohen-Kettenis PT; South West Netherlands Transition Research Group.

Department of Rehabilitation, Erasmus MC, University Medical Center, Rotterdam, the Netherlands.

Aim: The aim of this study was to describe the peer group activities, romantic relationships, and sexual activity and their interrelations of young adults with cerebral palsy (CP). Method: A cross-sectional study was performed in 87 participants (51 males, 36 females; mean age 20y 4mo, SD 1y 3mo range age 18-22y) without cognitive disabilities. Ninety-four per cent had spastic CP and 49% unilateral CP, while 78% were classified at Gross Motor Function Classification System level I and 84% at Manual Ability Classification System level I. Peer group activities, dating, romantic relationships, and sexual activity were assessed with an interview and questionnaire. Associations were analysed using logistic regression analyses. Results: The study cohort reported having friends and participating in activities with peers; 71% had experience of dating, 23% had a current romantic relationship, and 38% had experience of intercourse. Young adults with CP had less experience in romantic and sexual relationships than an age-appropriate Dutch reference population. Peer group activities and dating favoured development of romantic relationships and sexual activity. Older age was associated with greater sexual activity. Motor functioning, education level, and gender did not correlate with romantic relationships or sexual activity. Interpretation: Being involved in peer group activities and creating a context to arrange dates seems relevant for young adults with CP to develop

romantic relationships and sexual activity.

PMID: 20187888 [PubMed - as supplied by publisher]

11. J Musculoskelet Neuronal Interact. 2010 Mar;10(1):77-83.

Vibration treatment in cerebral palsy: A randomized controlled pilot study.

Ruck J, Chabot G, Rauch F.

Shriners Hospital for Children, Montreal, Qc, Canada.

In this 6-month trial, twenty children with cerebral palsy (age 6.2 to 12.3 years; 6 girls) were randomized to either continue their school physiotherapy program unchanged or to receive 9 minutes of side-alternating whole-body vibration (WBV; Vibraflex Home Edition II((R)), Orthometrix Inc) per school day in addition to their school physiotherapy program. Patients who had received vibration therapy increased the average walking speed in the 10 m walk test by a median of 0.18 ms(-1) (from a baseline of 0.47 ms(-1)), whereas there was no change in the control group (P=0.03 for the group difference in walking speed change). No significant group differences were detected for changes in areal bone mineral density (aBMD) at the lumbar spine, but at the distal femoral diaphysis aBMD increased in controls and decreased in the WBV group (P=0.03 for the group difference in aBMD change). About 1% of the WBV treatment sessions were interrupted because the child complained of fatigue or pain. In conclusion, the WBV protocol used in this study appears to be safe in children with cerebral palsy and may improve mobility function but we did not detect a positive treatment effect on bone.

PMID: 20190383 [PubMed - in process]

12. J Mot Behav. 2010 Feb 26. [Epub ahead of print]

Sit-to-Stand Movement in Children: A Review.

da Costa CS, Savelsbergh G, Rocha NA.

Department of Physiotherapy, Neuropediatric Research Unit, Federal University of São Carlos (UFSCar), Brazil.

The influence of determining factors on sit-to-stand (STS) movement in adults has been extensively described in the literature; however, there is a lack of information about such factors on children. Therefore, the purposes of the present study are to analyze the scientific publications about intrinsic and extrinsic factors influencing STS movement in children and to describe methodological procedures used in the studies under review. A bibliographical review was obtained from relevant database (1988-2009) using keywords, such as rising, chair, sit-to-stand, and children. In all, 109 articles were identified and 11 were selected. The literature indicates there is a lack of articles investigating disabilities other than cerebral palsy as well as extrinsic factors such as chair-type characteristics in typical and atypical children.

PMID: 20189906 [PubMed - as supplied by publisher]

13. Dev Med Child Neurol. 2010 Feb 24. [Epub ahead of print]

Reliability of kinematic measures of functional reaching in children with cerebral palsy.

Schneiberg S, McKinley P, Gisel E, Sveistrup H, Levin MF.

Centre for Interdisciplinary Research in Rehabilitation, Montreal, Quebec, Canada.

Aim: The determination of rehabilitation effectiveness in children with cerebral palsy (CP) depends on the metric properties of the outcome measure. We evaluated the reliability of kinematic measures of functional upper limb reaching movements in children with CP. Method: Thirteen children (ten females, three males) with spastic hemiplegic, diplegic, or quadriplegic CP affecting at least one arm (mean age 9y, SD 1.6y; range 6-11y; Manual Ability

Classification System [MACS] levels II-IV) were evaluated three times over 5 weeks. The kinematics of the more affected arm reaching to grasp a 2cm(3) block placed at three distances from the body midline were analysed. The reliability (test-retest) of six kinematic variables (endpoint trajectory straightness and smoothness, trunk displacement, elbow extension, shoulder horizontal adduction, and shoulder flexion] was tested and expressed as intraclass correlation coefficients (ICC, model 2,K) and 95% confidence intervals. Results: Trajectory smoothness, trunk displacement, elbow extension, and shoulder flexion (far target) had the highest ICCs (0.82-0.95). Other kinematic variables had moderate (0.50</=ICC</=0.81) or low (0.17-0.38) reliability. Test-retest reliability was task dependent, as reaches required different degrees of trunk displacement and joint excursion. Interpretation: Kinematic variables can be used as outcomes in clinical trials to test upper limb intervention effectiveness on motor performance and movement quality. As kinematic variables are task specific, reliability should be interpreted in the context of task requirements.

PMID: 20187878 [PubMed - as supplied by publisher]

14. Rev Neurol. 2010 Feb 16;50(4):256.

Application of robotic systems in infantile cerebral palsy. [Article in Spanish]

Molina-Rueda F, Aguila-Maturana AM, Molina-Rueda MJ, Miangolarra-Page JC.

Universidad Rey Juan Carlos. Facultad de Ciencias de la Salud, 28922 Alcorcon, Espana.

PMID: 20198600 [PubMed - in process]

15. NeuroRehabilitation. 2010 Jan 1;26(2):115-22.

Transcutaneous electrical nerve stimulation of hip adductors improves gait parameters of children with spastic diplegic cerebral palsy.

Alabdulwahab SS, Al-Gabbani M.

Rehabilitation Sciences Department, Faculty of Applied Medical Sciences, King Saud University, Riyadh, Saudi Arabia.

Background: Reduction of spasticity in hip adductor muscles is one of the essential factors to improve standing, gait, and personal hygiene of children with spastic diplegic cerebral palsy (CP). Surgical and medical methods have been commonly used for such purposes. These methods are expensive, required special skill and have side effects. Objective: To study the effect of conventional TENS on spasticity in hip adductors and gait parameters of children with spastic diplegic CP. Subject: An experimental group of twenty seven ambulant children with spastic diplegic CP and control group of fifteen healthy children were voluntary participants in the study. Methods: The experimental group received two different TENS management programs. The 1st TENS program was a one-time trial management program that included an ongoing application of conventional TENS on bilateral hip adductors during passive hip abduction, and during walking for a pre-determined distance. The 2nd TENS program was a one-week trial management program that included 15 minutes of ongoing application of conventional TENS on bilateral hip adductors during walking, three sessions a day for a week. The effects of the TENS program was assessed using the Modified Ashworth Scale, the balance master system and visual observations of knee positions. Results: A significant improvement was recorded in spasticity of hip adductors, gait parameters and knees position of the experimental group. Conclusion: Functional application of TENS to hip adductors of children with spastic diplegic CP can reduce spasticity and improve gait pattern.

PMID: 20203376 [PubMed - in process]

16. Rev Gaucha Enferm. 2009 Sep;30(3):437-44.

Mothers experiencing the diagnosis of cerebral palsy in their children [Article in Portuguese]

Milbrath VM, Soares DC, Amestoy SC, Cecagno D, de Siqueira HC.

Programa de Pós-Graduação em Enfermagem da Universidade Federal do Rio Grande do Sul (UFRGS), Brasil. vivimarten@ig.com.br

The study aimed at understanding how the mothers of children with special needs, due to the diagnosis of cerebral palsy, experienced the disclosure of the diagnosis. An exploratory-descriptive research was held from a qualitative approach. Data were collected and recorded through semi-structured interviews with six mothers of children with cerebral palsy that attended the institution of the study and analyzed according to Roy's Adaptation Model. The results pointed out that the main difficulties faced by the mothers were related to the understanding and acceptance of the situation by the family and the lack of preparation of the health professionals in revealing the diagnosis of special needs of their children.

PMID: 20187424 [PubMed - in process]

17. Hum Brain Mapp. 2010 Mar 4. [Epub ahead of print]

Somatosensory-evoked cortical activity in spastic diplegic cerebral palsy.

Wingert JR, Sinclair RJ, Dixit S, Damiano DL, Burton H.

Department of Health and Wellness, University of North Carolina at Asheville, One University Heights, Asheville, North Carolina.

Somatosensory deficits have been identified in cerebral palsy (CP), but associated cortical brain activity in CP remains poorly understood. Functional MRI was used to measure blood oxygenation level-dependent (BOLD) responses during three tactile tasks in 10 participants with spastic diplegia (mean age: 18.70 years, SD: 7.99 years; 5 females) and 10 age-matched controls (mean age: 18.60 years, SD: 3.86 years; 5 females). Tactile stimulation involved servo-controlled translation of smooth or embossed surfaces across the right index finger pad; the discrimination tasks with embossed surfaces involved judging whether (1) paired shapes were similar or different, and (2) a rougher set of horizontal gratings preceded or followed a smoother one. Velocity and duration of surface translation was identical across all trials. In addition, an event-related design revealed response dynamics per trial in both groups. Compared to controls, individuals with spastic diplegia had significantly reduced spatial extents in activated cortical areas and smaller BOLD response magnitudes in cortical areas for somatosensation, motor, and goal-directed/attention behaviors. These results provide mechanisms for the widespread somatosensory deficits in CP. The reduced activation noted across multiple cortical areas might contribute to motor deficits in CP. Hum Brain Mapp, 2010. (c) 2010 Wiley-Liss, Inc.

PMID: 20205249 [PubMed - as supplied by publisher]

Epidemiology / Aetiology / Diagnosis & Early Treatment

Please note: This is not yet a comprehensive outline of cerebral palsy prevention literature. It is expected that more research will be included when the search terms are expanded to include key terms other than "cerebral palsy". It is a work-in-progress and it will be expanded in coming months.

18. Dev Med Child Neurol. 2010 Feb 19. [Epub ahead of print]

Cerebral palsy in siblings caused by compound heterozygous mutations in the gene encoding protein C.

Fong CY, Mumford AD, Likeman MJ, Jardine PE.

Department of Paediatric Neurology, Bristol Royal Hospital for Children, Bristol, UK.

We report two sisters with extensive bilateral periventricular haemorrhagic infarction (PVHI) causing cerebral palsy (CP). The older sister presented at 20 months with cortical visual blindness, spastic diplegia, and purpura fulminans. The younger sister presented aged 3 days old with apnoeas and multifocal seizures. She subsequently had global developmental delay, cortical visual blindness, spastic quadriplegia, epilepsy, and purpura fulminans at age 2 years. Neuroimaging of both siblings showed bilateral PVHI consistent with bilateral cerebral intramedullary venous thrombosis occurring at under 28 weeks' gestation for the older sister and around time of birth for the younger sister. At latest follow-up, the older sister (13y) has spastic diplegia at Gross Motor Function Classification System (GMFCS) level II, and the younger sister (10y) has spastic quadriplegia at GMFCS level IV. Both sisters showed partial quantitative reduction in plasma protein C antigen and severe qualitative reduction in plasma protein C anticoagulant activity. They were heterozygous for two independent mutations in the protein C gene (PROC). There was no other risk factor for CP. To our knowledge, this is the first family reported with compound heterozygous PROC mutations as the likely genetic cause of familial CP. This report adds to the list of known monogenic causes of CP.

PMID: 20187890 [PubMed - as supplied by publisher]

19. Obstet Gynecol. 2010 Mar;115(3):669-71.

Committee Opinion No. 455: Magnesium sulfate before anticipated preterm birth for neuroprotection.

Committee on Obstetric Practice; Society for Maternal-Fetal Medicine.

Numerous large clinical studies have evaluated the evidence regarding magnesium sulfate, neuroprotection, and preterm births. The Committee on Obstetric Practice and the Society for Maternal-Fetal Medicine recognize that none of the individual studies found a benefit with regard to their primary outcome. However, the available evidence suggests that magnesium sulfate given before anticipated early preterm birth reduces the risk of cerebral palsy in surviving infants. Physicians electing to use magnesium sulfate for fetal neuroprotection should develop specific guidelines regarding inclusion criteria, treatment regimens, concurrent tocolysis, and monitoring in accordance with one of the larger trials.

PMID: 20177305 [PubMed - in process]

20. Dev Med Child Neurol. 2010 Feb 24. [Epub ahead of print]

Early prediction of cerebral palsy by computer-based video analysis of general movements: a feasibility study.

Adde L, Helbostad JL, Jensenius AR, Taraldsen G, Grunewaldt KH, Støen R.

Department of Clinical Services, Physiotherapy Section, St. Olav University Hospital, Trondheim, Norway.

Aim: The aim of this study was to investigate the predictive value of a computer-based video analysis of the development of cerebral palsy (CP) in young infants. Method: A prospective study of general movements used re-

cordings from 30 high-risk infants (13 males, 17 females; mean gestational age 31wks, SD 6wks; range 23-42wks) between 10 and 15 weeks post term when fidgety movements should be present. Recordings were analysed using computer vision software. Movement variables, derived from differences between subsequent video frames, were used for quantitative analyses. CP status was reported at 5 years. Results: Thirteen infants developed CP (eight hemiparetic, four quadriparetic, one dyskinetic; seven ambulatory, three non-ambulatory, and three unknown function), of whom one had fidgety movements. Variability of the centroid of motion had a sensitivity of 85% and a specificity of 71% in identifying CP. By combining this with variables reflecting the amount of motion, specificity increased to 88%. Nine out of 10 children with CP, and for whom information about functional level was available, were correctly predicted with regard to ambulatory and non-ambulatory function. Interpretation: Prediction of CP can be provided by computer-based video analysis in young infants. The method may serve as an objective and feasible tool for early prediction of CP in high-risk infants.

PMID: 20187882 [PubMed - as supplied by publisher]

21. Toxicol Appl Pharmacol. 2010 Feb 23. [Epub ahead of print]

Organophosphates induce distal axonal damage, but not brain oedema, by inactivating neuropathy target esterase.

Read DJ, Li Y, Chao MV, Cavanagh JB, Glynn P.

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Single doses of organophosphorus compounds (OP) which covalently inhibit neuropathy target esterase (NTE) can induce lower-limb paralysis and distal damage in long nerve axons. Clinical signs of neuropathy are evident three weeks post-OP dose in humans, cats and chickens. By contrast, clinical neuropathy in mice following acute dosing with OPs or any other toxic compound has never been reported. Moreover, dosing mice with ethyloctylphosphonofluoridate (EOPF) - an extremely potent NTE inhibitor - causes a different (subacute) neurotoxicity with brain oedema. These observations have raised the possibility that mice are intrinsically resistant to neuropathies induced by acute toxic insult, but may incur brain oedema, rather than distal axonal damage, when NTE is inactivated. Here we provide the first report that hind-limb dysfunction and extensive axonal damage can occur in mice three weeks after acute dosing with a toxic compound, bromophenylacetylurea. Three weeks after acutely dosing mice with neuropathic OPs no clinical signs were observed, but distal lesions were present in the longest spinal sensory axons. Similar lesions were evident in undosed nestin-cre:NTEfl/fl mice in which NTE had been genetically-deleted from neural tissue. The extent of OP-induced axonal damage in mice was related to the duration of NTE inactivation and, as reported in chickens, was promoted by post-dosing with phenylmethanesulfonylfluoride. However, phenyldipentylphosphinate, another promoting compound in chickens, itself induced in mice lesions different from the neuropathic OP type. Finally, EOPF induced subacute neurotoxicity with brain oedema in both wild-type and nestin-cre:NTEfl/fl mice indicating that the molecular target for this effect is not neural NTE.

PMID: 20188121 [PubMed - as supplied by publisher]

22. Cell Mol Biol (Noisy-le-grand). 2010 Feb 9;56 Suppl:OL1223-30.

Effects of new Phoneutria spider toxins on glutamate release and [Ca2+]i in rat cortical synaptosomes.

Carneiro DS, Vieira LB, Cordeiro MN, Richardson M, Castro-Junior CJ, Gomez MV, Reis HJ.

Laboratório de Neurofarmacologia, Departamento de Farmacologia, ICB-UFMG. Av. Antônio Carlos, 6627. Campus Pampulha. BH-MG, CEP 31270-901, Brazil.

Studies revealed that the venom of the Brazilian "armed" spider Phoneutria nigriventer contains potent neurotoxins that caused excitatory symptoms such as salivation, lachrymation, priapism, convulsions, flaccid and spastic paralysis. It was also reported that the main mechanism of action of those neurotoxins are effects on ion channels such as inhibition of the inactivation of Na+ channels, blockage of K+ channels and blockage of calcium channels. The venom from Phoneutria keyserlingi, as might be expected, contains a series of polypeptides that are very similar, but not identical, to the proteins previously obtained from the venom of P. nigriventer in terms of their amino acid

sequences and biological activities. We evaluated the effects of some of the toxins of P. nigriventer and P. keyserlingi on glutamate release and the decrease in [Ca2+]i by using synaptosomes of rat brain cortices and fluorimetric assays. Sequence comparisons between the Phoneutria toxins of both the species showed great similarity in the location of cysteine residues. However, thus far, no pharmacological assays were performed to evaluate the extension of those biochemical modifications. Our results showed that differences between the amino acid sequences of Phoneutria toxins of both the species lead to the significant changes in the pharmacological properties of these toxins.

PMID: 20158975 [PubMed - in process]

23. Recent Pat CNS Drug Discov. 2010 Jan;5(1):14-22.

An update on peptide drugs for voltage-gated calcium channels.

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Voltage-gated calcium channels are one of the major ion channels distributed in the human central nervous system, and mediate an influx of extracellular Ca(2+) in response to membrane depolarization. Calcium channels are of particular interest in a broad range of cellular functions including cell proliferation and differentiation, gene expression, neurite outgrowth, transmitter and hormone release, and brain plasticity. The dysfunction of calcium channels is related to a variety of clinical disorders such as migraine, hemiplegia, and epilepsy. Therefore, calcium channels have gained great pharmaceutical interest as a privileged target class for the treatment of a wide range of human diseases. This review will examine the known marketed peptide drugs for calcium channels and address the development of some important patented peptide molecules targeting calcium channels.

PMID: 19751208 [PubMed - indexed for MEDLINE]

24. Rev Neurol. 2010 Jan 1-15;50(1):61.

Cortical infarction mimicking paralysis of the median nerve [Article in Spanish]

Giner-Bernabeu JC, Sempere AP, Hernández-Rubio L, López-Celada S, Montoya-Gutiérrez J.

PMID: 20073027 [PubMed - indexed for MEDLINE]

25. Somatosens Mot Res. 2009 Dec;26(4):90-104.

Functional connectivity for somatosensory and motor cortex in spastic diplegia.

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Functional connectivity (fcMRI) was analyzed in individuals with spastic diplegia and age-matched controls. Pearson correlations (r-values) were computed between resting state spontaneous activity in selected seed regions (sROI) and each voxel throughout the brain. Seed ROI were centered on foci activated by tactile stimulation of the second fingertip in somatosensory and parietal dorsal attention regions. The group with diplegia showed significantly expanded networks for the somatomotor but not dorsal attention areas. These expanded networks overran nearly all topological representations in somatosensory and motor areas despite a sROI in a fingertip focus. A possible underlying cause for altered fcMRI in the group with dipegia, and generally sensorimotor deficits in spastic diplegia, is that prenatal third trimester white-matter injury leads to localized damage to subplate neurons. We hypothesize that intracortical connections become dominant in spastic diplegia through successful competition with diminished or absent thalamocortical inputs. Similar to the effects of subplate ablations on ocular dominance col-

umns (Kanold and Shatz, Neuron 2006;51:627-638), a spike timing-dependent plasticity model is proposed to explain a shift towards intracortical inputs.

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