Cerebral Palsy ALLIANCE

CP Research News

Monday 25 July 2011

Interventions

1. Acta Paediatr. 2011 Jul 18. doi: 10.1111/j.1651-2227.2011.02412.x. [Epub ahead of print]

Feeding problems, growth and nutritional status in children with cerebral palsy.

Dahlseng MO, Finbråten AK, Júlíusson PB, Skranes J, Andersen G, Vik T.

Department of Laboratory Medicine, Children's and Women's Health, Faculty of Medicine, Norwegian University of Science and Technology, Trondheim, Norway Department of Clinical Medicine, Section for Paediatrics, University of Bergen. The Cerebral Palsy Registry of Norway, Vestfold Hospital Trust, Tønsberg, Norway.

Aim: The aim was to estimate the prevalence of feeding and nutritional problems in children with cerebral palsy (CP) in Norway. Methods: Data were abtracted from the Norwegian CP Register for 661 (368 boys) children born 1996-2003 (mean age 6 years 7 months; SD: 1.5). For children born from 1999-2003 weight and height were available. Body mass index (BMI) (kg/m(2)) was used to assess nutritional status. Results: 132 (21%) children with CP were completely dependent on assistance during feeding. The prevalence of gastrostomy tube feeding was 14%. Longer duration of gastrostomy tube feeding was associated with higher weight and BMI, but not with height. Only 63% of the children with CP had normal BMI, 7% had grade 3 thinness while the prevalence of overweight and obesity in our study was 16%. In all 20% of the children had mean z-scores for weight and/or height below - 2 SD. Conclusion: Feeding problems in children with CP were common and associated with poor linear growth. A high proportion of the children were undernourished. Moreover, our results suggest that gastrostomy tube feeding may have been introduced too late in some children.

PMID: 21767308 [PubMed - as supplied by publisher]

2. Clin Nutr. 2011 Jul 15. [Epub ahead of print]

The CP-MST, a malnutrition screening tool for institutionalized adult cerebral palsy patients.

Benigni I, Devos P, Rofidal T, Seguy D.

CESAP formation, Paris, APEI Papillons Blancs, Douai, France.

BACKGROUND & AIMS: Progress in management of cerebral palsy (CP) patients has helped to increase life expectancy, but has also revealed nutritional consequences of this disability. The aims of this study were to determine the prevalence of malnutrition in long-term-institutionalized adult patients with CP and to propose specific malnutrition screening tool. METHODS: Practitioners at 15 specialized institutions hosting CP patients assessed their nutritional status and completed a binary questionnaire containing thirteen questions related to

factors suspected of increasing malnutrition. Moderate malnutrition was defined as the following: loss of weight (%) ≥5 to <10 or BMI ≥16 to <18.5 or albuminemia (g/l) ≥30 to <35. Markers of malnutrition were identified by bivariate analysis (ANOVA and Chi-square). Stepwise factorial discriminant analysis was used to determine the best subset of parameters for use in computation of a screening score. RESULTS: A total of 365 patients age 35.7 ± 9.0 years were identified. Malnutrition was severe in 25%, moderate in 33% and absent in 42% of cases. The four strongest factors associated with malnutrition were used to build a three-level malnutrition screening tool for CP adult patients (CP-MST) as follows: body weight <40 kg (10 points), sitting position uncomfortable or impossible (4 points), partial or total help to feed (4 points) and suspicion of gastro-esophageal reflux (3 points), (P < 0.0001): A screening score higher than 10 points indicated high risk with malnutrition probability of 90%, and detected 37% of malnourished patients. Conversely, a score equal to 0 excluded severe malnutrition in 90% of cases. CONCLUSION: In light of the fact that 58% of these patients were malnourished, the CP-MST would appear to be useful for detecting malnutrition, underlining the need for a multidisciplinary approach in CP patients.

PMID: 21764187 [PubMed - as supplied by publisher]

3. Pediatr Neurol. 2011 Aug;45(2):95-9.

Does motor performance matter in botulinum toxin efficacy for drooling?

Erasmus CE, Scheffer AR, van Hulst K, van Limbeek J, van den Hoogen FJ, Rotteveel JJ, Jongerius PH.

Department of Pediatric Neurology, Radboud University Nijmegen Medical Centre/Donders Institute for Brain, Cognition and Behavior, Nijmegen, The Netherlands.

The aim of this study was to define factors that influence therapy outcome of submandibular botulinum toxin injections for drooling in children with cerebral palsy or mental disability. We postulated that differences in response may be explained by the variation of dysfunctions in the various cerebral palsy subtypes. Prospectively collected data were evaluated of 80 spastic and 48 dyskinetic children, of whom 70% had an IQ of <70. In addition, the data of 23 fully ambulant children with mental disability only were examined. Flow and Drooling Quotient were assessed at baseline and at 8 weeks after injection. After treatment, both the Drooling Quotient and submandibular flow decreased in all children. Morbidity associated with the procedure was limited. Ninety-three children responded to botulinum. Decrease of submandibular flow in these children was associated with reduction of parotid flow. In those who did not respond to therapy, spread across all 3 diagnostic classifications, parotid flow increased after injection. Response failure is characterized by increased parotid flow after injection; however, the precise role of parotid flow in therapy failure remains unclear. We cannot predict who will respond to botulinum toxin to treat drooling.

PMID: 21763949 [PubMed - in process]

4. Res Dev Disabil. 2011 Jul 18. [Epub ahead of print]

Speech-associated labiomandibular movement in Mandarin-speaking children with quadriplegic cerebral palsy: A kinematic study.

Hong WH, Chen HC, Yang FP, Wu CY, Chen CL, Wong AM.

Department of Sports Medicine, China Medical University, No. 91, Hsueh-Shih Road, Taichung 40402, Taiwan.

The purpose of this study was to investigate the speech-associated labiomandibular movement during articulation production in Mandarin-speaking children with spastic quadriplegic (SQ) cerebral palsy (CP). Twelve children with SQ CP (aged 7-11 years) and 12 age-matched healthy children as controls were enrolled for the study. All children underwent analysis of percentage of consonants correct (PCC) and kinematic analysis of speech tasks using the Vicon Motion 370 system. Kinematic parameters included utterance duration, displacement and velocity of the lip and jaw, coefficient of variation (CV) of lip utterance duration, and spatial and temporal coupling of labiomandibular movement of speech produced in mono-syllable (MS) and poly-syllable (PS) tasks. Children with CP showed lower

temporal coupling (MS, p=0.015; PS, p=0.007), but not spatial coupling, of labiomandibular movement than healthy children. Children with CP had greater CVs (MS, p=0.003; PS, p=0.010) and the peak opening displacement and velocity of lower lip and jaw (p<0.05) and lower PCC (p<0.001) than healthy children. Children with SQ CP displayed labiomandibular coupling movement impairment, especially in the aspect of temporal coupling. These children also had high temporal oromotor variability and needed to make more effort to coordinate the labiomandibular movement for speech production.

PMID: 21775100 [PubMed - as supplied by publisher]

5. Am J Phys Med Rehabil. 2011 May;90(5):364-71.

In vivo evaluations of morphologic changes of gastrocnemius muscle fascicles and achilles tendon in children with cerebral palsy.

Gao F, Zhao H, Gaebler-Spira D, Zhang LQ.

Department of Health Care Sciences, the University of Texas Southwestern Medical Center at Dallas (FG); Department of Physiology and Biomedical Engineering, Mayo Clinic College of Medicine, Rochester, Minnesota (HZ); Rehabilitation Institute of Chicago, Illinois (DG-S, L-QZ); and Department of Physical Medicine and Rehabilitation (DG-S, L-QZ), Department of Orthopaedic Surgery (L-QZ), and Department of Biomedical Engineering (L-QZ), Northwestern University, Chicago, Illinois.

OBJECTIVE: The Achilles tendon plays an important role in soleus and gastrocnemius muscle functions, including proper muscle force transmission and movement generation. However, few studies have examined concurrent changes of tendon and muscle properties in neurologic disorders. The objective of this study was to investigate the morphologic characteristics of both the calf muscle fascicles and the Achilles tendon in children with cerebral palsy (CP). DESIGN: A cross-sectional study was planned, and 12 children with CP and 11 typically developing children participated in this study. For both groups, B-mode ultrasonography was used to evaluate the architecture of the medial gastrocnemius muscle, including fascicle length and pennation angle at various ankle (20, 10, and 0 degrees plantar flexion and 10 degrees dorsiflexion) and knee (full extension and 90 degrees flexion) positions. The length and cross-sectional area of the Achilles tendon were also evaluated using ultrasonography. RESULTS: For both CP and control groups, muscle fascicle length, pennation angle, and Achilles tendon length and cross-sectional area varied with ankle and knee positions systematically. Compared with controls, children with CP had shorter muscle fascicles across the tested ankle range of motion ($P \leq 0.003$), longer Achilles tendon ($P = 0.001$), and smaller cross-sectional area of the Achilles tendon ($P = 0.003$). CONCLUSIONS: The changes in Achilles tendon properties could be a result of adaptation to calf muscle fascicle shortening and stiffening, which may affect performance of the muscles. A better understanding of the interactions between calf muscle fascicles and Achilles tendon in children with CP may help treat the pathologic changes more effectively.

PMID: 21765255 [PubMed - in process]

6. Am J Phys Med Rehabil. 2011 Jul;90(7):554-63.

Treating spastic equinus foot from cerebral palsy with botulinum toxin type a: what factors influence the results?: an analysis of 189 consecutive cases.

Pascual-Pascual SI, Pascual-Castroviejo I, Garcia Ruiz PJ.

Pediatrics, Universidad Autónoma de Madrid (SIP-P); Pediatric Neurology Department, Hospital Universitario La Paz (IP-C); and Department of Neurology, Fundación Jiménez Diaz, Madrid, Spain (PJGR).

OBJECTIVE: The aim of this study was to determine the variables that improve spastic equinus foot caused by cerebral palsy when treated with botulinum toxin type A. DESIGN: We reviewed all patients treated for spastic equinus foot using botulinum toxin type A (Botox) in the triceps suralis during a 3 1/2-yr period and analyzed the results after the first injection. There were 117 patients (72 diplegic and 45 hemiplegic patients) and a total of 189 triceps suralis treated. Variables analyzed included age, total dose per session, total dose per kilogram for each

session, total dose per triceps, triceps dose per kilogram, type of cerebral palsy, cognitive level, botulinum toxin dilution, and physiotherapy. Assessments of efficacy were done using a Global Assessment Scale rated independently by parents, therapists, and a neurologist; the Modified Ashworth Scale; and the Modified Physician Rating Koman scale. RESULTS: Improvement was observed in all scales (P < 0.001). The change of foot position during walking was the best parameter for measuring improvement. There was correlation between the grade of improvement and the dose per kilogram for each triceps suralis (P < 0.001). Patient age was inversely correlated with improvement (P = 0.043). Diplegic and hemiplegic patients improved similarly, but the hemiplegic patients required higher doses for each muscle (P < 0.001). The most effective dose for diplegic patients was 3-4 IU/kg for each triceps, compared with 4-6 IU/kg for hemiplegic patients. Different dilutions of Botox (100, 50, and 40 U/ml) resulted in similar outcomes. No better results were achieved when 2-3 sessions/wk of physiotherapy was added to a daily program of exercises at home to enhance foot dorsiflexion. CONCLUSIONS: The dose per kilogram of Botox injected into triceps suralis and the patient age influence the results. The most effective dose is different between diplegic and hemiplegic patients. The concentration of botulinum toxin type A does not play a significant role in the outcome.

PMID: 21765274 [PubMed - in process]

7. J Biomech. 2011 Jul 13. [Epub ahead of print]

Passive muscle mechanical properties of the medial gastrocnemius in young adults with spastic cerebral palsy.

Barber L, Barrett R, Lichtwark G.

Musculoskeletal Research Program, Griffith University, Gold Coast Campus, Queensland 4222, Australia.

Individuals with spastic cerebral palsy (SCP) exhibit restricted joint range of motion and increased joint stiffness due to structural alterations of their muscles. Little is known about which muscle-tendon structures are responsible for these alterations. The aim of this study was to compare the passive mechanics of the ankle joint and medial gastrocnemius (MG) muscle in young adults with SCP and typically developed (TD) individuals. Nine ambulant SCP (17±2 years) and ten TD individuals (18±2 years) participated in the study. Physiological cross sectional area was estimated using freehand 3D ultrasound and found to be 37% lower in the SCP group. An isokinetic dynamometer rotated the ankle through its range while joint torque and ultrasound images of the MG muscle fascicles were simultaneously measured. Mean ankle stiffness was found to be 51% higher and mean MG fascicle strain 47% lower in the SCP group. Increased resistance to passive ankle dorsiflexion in SCP appears to be related to the inability of MG muscle fascicles to elongate with increased force.

PMID: 21762920 [PubMed - as supplied by publisher]

8. Gait Posture. 2011 Jul 19. [Epub ahead of print]

Influence of heel lifts during standing in children with motor disorders.

Bartonek A, Lidbeck CM, Pettersson R, Weidenhielm EB, Eriksson M, Gutierrez-Farewik E.

Department of Women's and Children's Health, Karolinska Institutet, Stockholm, Sweden.

Heel wedges may influence standing posture but how and to what extent are unknown. Thirty-two children with motor disorders - 16 with arthrogryposis multiplex congenita (AMC) and 16 with cerebral palsy (CP) - and 19 control children underwent a three-dimensional motion analysis. Unassisted standing during 20s with shoes only and with heel lifts of 10, 20 and 30mm heights was recorded in a randomized order. The more weight-bearing limb or the right limb was chosen for analysis. In both the AMC and CP groups, significant changes were seen between various heel lifts in ankle, knee and pelvis, and in the control group in the ankle only. Between orthosis and non-orthosis users significant differences were seen between different heel lift conditions in ankle, knee and trunk in the AMC group and in the ankle in the CP group. Pelvis position changed toward less anterior tilt with increasing heel height, but led to increasing knee flexion in most of the children, except for the AMC Non-Ort group. Children with

AMC and CP represent different motor disorders, but the heel wedges had a similar influence on pelvis, hip and knee positions in all children with CP and in the AMC orthosis users. A challenge is to apply heel heights adequate to each individual's orthopaedic and neurologic conditions to improve biomechanical alignment with respect to all body segments.

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9. Eklem Hastalik Cerrahisi. 2011 Aug;22(2):69-74.

Outcomes of multilevel orthopedic surgery in children with cerebral palsy [Article in Turkish]

Koca K, Yıldız C, Yurttaş Y, Balaban B, Hazneci B, Bilgiç S, Başbozkurt M.

Department of Orthopedics and Traumatology, Gülhane Military Medical Academy, Ankara, Turkey. cyorto@yahoo.com.

OBJECTIVES: Outcomes of single-event bilateral multilevel orthopedic surgery in children with cerebral palsy were retrospectively investigated by physical findings, and gross motor function measurement (GMFM) score in all patients and additionally by joint kinematics, and time-distance parameters in ambulatory patients. PATIENTS AND METHODS: A total of 24 patients (17 ambulatory; 7 non ambulatory; mean age 12 years; range 5 to 19 years) treated with multilevel orthopedic surgery between December 2003 and December 2005 were included in the study. Patients were evaluated with physical examination and GMFM score. In addition, computed gait analysis was used to evaluate joint kinematics and time-distance parameters in ambulatory children. The following surgeries were performed on the children in the study cohort: adductor tenotomy (n=24); psoas lengthening (n=14); hamstring lengthening (n=46); distal rectus femoris transfer (n=18); bilateral Achilles tendon lengthening (n=22); distal femoral derotation osteotomy (n=1); open reduction and Dega osteotomy (n=1), and proximal femur resection (n=2). Patients were evaluated with the same parameters after an average of eight months postoperatively. The pre- and postoperative results were statistically compared. RESULTS: Improvements were achieved in the lying-rolling (7%), sitting (9%), crawling-kneeling (7%), standing (5%), and walking-running-jumping (5%) activities of GMFM score. An increase in hip abduction angle and external rotation and a decrease in the Thomas test results were observed. A decrease in popliteal angle and an increase in active and passive knee extension were provided. Active and passive ankle dorsiflexion increased. In the kinematic parameters, the minimum hip and knee flexions in the stance phase were significantly decreased, while no significant decrease was seen in the maximum hip and knee flexion in the swing phase. Both the ankle dorsiflexion in the stance and swing phase and the time-distance parameters consist of walking velocity, stride length and the cadence were significantly improved. CONCLUSION: Single-event bilateral multilevel orthopedic surgery performed in the right indication was shown to be effective with improvements in physical examination findings GMFM scores, joint kinematics and time-distance parameters in children with cerebral palsy.

PMID: 21762060 [PubMed - in process]

10. Indian J Orthop. 2011 Jul;45(4):314-9.

Multilevel orthopedic surgery for crouch gait in cerebral palsy: An evaluation using functional mobility and energy cost.

Ganjwala D.

Ganjwala Orthopaedic Hospital, Ahmedabad, Gujarat, India.

BACKGROUND: The evidence for the effectiveness of orthopaedic surgery to correct crouch gait in cerebral diplegic is insufficient. The crouch gait is defined as walking with knee flexion and ankle dorsiflexion through out the stance phase. Severe crouch gait in patients with spastic diplegia causes excessive loading of the patellofemoral joint and may result in anterior knee pain, gait deterioration, and progressive loss of function. We retrospectively evaluated the effect of surgery on the mobility and energy consumption at one year or more with the help of validated scales and scores. MATERIALS AND METHODS: 18 consecutive patients with mean age of 14.6 years

with cerebral diplegia with crouched gait were operated for multilevel orthopaedic surgery. Decisions for surgery were made with the observations on gait analysis and physical examination. The surgical intervention consisted of lengthening of short muscle-tendon units, shortening of long muscles and correction of osseous deformities. The paired samples t test was used to compare values of physical examination findings, walking speed and physiological cost index. Two paired sample Wilcoxon signed rank test was used to compare functional walking scales. RESULTS: After surgery, improvements in functional mobility, walking speed and physiological cost index were found. No patient was able to walk 500 meters before surgery while all were able to walk after surgery. The improvements that were noted at one year were maintained at two years. CONCLUSIONS: Multilevel orthopedic surgery for older children and adolescents with crouch gait is effective for improving function and independence.

PMID: 21772623 [PubMed - in process]

11. J Child Orthop. 2011 Jun;5(3):239. Epub 2011 May 15.

Erratum to: Reconstruction of acute closed traumatic extensor hallucis longus tendon rupture in adolescents with spastic cerebral palsy.

Bishay SN.

PMID: 21779310 [PubMed - in process]

12. Am J Phys Med Rehabil. 2011 Jul;90(7):539-553.

Multisite Trial Comparing the Efficacy of Constraint-Induced Movement Therapy with that of Bimanual Intensive Training in Children with Hemiplegic Cerebral Palsy: Postintervention Results.

Facchin P, Rosa-Rizzotto M, Visonà Dalla Pozza L, Turconi AC, Pagliano E, Signorini S, Tornetta L, Trabacca A, Fedrizzi E; GIPCI Study Group.

Epidemiology and Community Medicine Unit, Pediatrics Department, University of Padua, Padua (PF, MR-R, LVDP); Scientific Research Institute Eugenio Medea, Bosisio Parini, Lecco (ACT); Division of Developmental Neurology, National Neurological Institute C. Besta, Milan (EP, EF); Department of Child Neurology and Psychiatry, IRCCS C. Mondino Institute of Neurology, University of Pavia, Pavia (SS); Child and Adolescent Psychiatry Department, Sant'Anna Hospital OIRM, Turin (LT); and Scientific Research Institute Eugenio Medea, Ostuni, Italy (AT).

OBJECTIVE: The aim of this study was to compare the effects of modified constraint-induced movement therapy (mCIMT; restraint of unaffected limb combined with unimanual intensive rehabilitation) with those of a bimanual intensive rehabilitation treatment (IRP) in children with hemiplegic cerebral palsy after a 10-wk practice vs. standard treatment (ST). DESIGN: This study is a multicenter, cluster-randomized controlled clinical trial of tested groups of children with hemiplegic cerebral palsy treated using mCIMT, IRP, or ST. For 10 wks, in mCIMT and IRP, the intensive practice lasted 3 hrs/day, 7 days/wk; in ST, 1-hr sessions twice a week were provided. The primary outcomes are upper limb/hand function (Quality of Upper Extremity Skills Test) and activities of daily living (Besta Scale), which are assessed before and after treatment. One hundred five patients were recruited, 39 to the mCIMT group, 33 to the IRP group, and 33 to the ST group. RESULTS: IRP and mCIMT significantly improved paretic hand function both in the Quality of Upper Extremity Skills Test and in the Besta Scale, whereas ST did not. mCIMT improved grasp more than IRP did ($P < 0.01$), whereas bimanual spontaneous use in play increased more with IRP ($P = 0.0005$). Activities of daily living in 2- to 6-yr-olds improved more with IRP ($P < 0.0001$) than with mCIMT ($P = 0.011$). Unaffected limb improved more from bimanual practice (IRP; $P = 0.02$). CONCLUSIONS: More advantages resulted from intensive practice than in the standard one, in mCIMT for grasp and in IRP for bimanual spontaneous use and activities of daily living in younger children.

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13. Exp Brain Res. 2011 Jul 16. [Epub ahead of print]

The positive effect of mirror visual feedback on arm control in children with Spastic Hemiparetic Cerebral Palsy is dependent on which arm is viewed.

Smorenburg AR, Ledebt A, Feltham MG, Deconinck FJ, Savelsbergh GJ.

Institute for Biomedical Research into Human Movement and Health, School of Health Care Science, Manchester Metropolitan University, John Dalton Building, Oxford Road, Manchester, M1 5GD, UK, a.r.p.smorenburg@vu.nl.

Mirror visual feedback has previously been found to reduce disproportionate interlimb variability and neuromuscular activity in the arm muscles in children with Spastic Hemiparetic Cerebral Palsy (SHCP). The aim of the current study was to determine whether these positive effects are generated by the mirror per se (i.e. the illusory perception of two symmetrically moving limbs, irrespective of which arm generates the mirror visual feedback) or by the visual illusion that the impaired arm has been substituted and appears to move with less jerk and in synchrony with the less-impaired arm (i.e. by mirror visual feedback of the less-impaired arm only). Therefore, we compared the effect of mirror visual feedback from the impaired and the less-impaired upper limb on the bimanual coupling and neuromuscular activity during a bimanual coordination task. Children with SHCP were asked to perform a bimanual symmetrical circular movement in three different visual feedback conditions (i.e. viewing the two arms, viewing only one arm, and viewing one arm and its mirror image), combined with two head orientation conditions (i.e. looking from the impaired and looking from the less-impaired body side). It was found that mirror visual feedback resulted in a reduction in the eccentric activity of the Biceps Brachii Brevis in the impaired limb compared to the condition with actual visual feedback from the two arms. More specifically, this effect was exclusive to mirror visual feedback from the less-impaired arm and absent when mirror visual feedback from the impaired arm was provided. Across conditions, the less-impaired arm was the leading limb, and the nature of this coupling was independent from visual condition or head orientation. Also, mirror visual feedback did not affect the intensity of the mean neuromuscular activity or the muscle activity of the Triceps Brachii Longus. It was concluded that the positive effects of mirror visual feedback in children with SHCP are not just the result of the perception of two symmetrically moving limbs. Instead, in order to induce a decrease in eccentric neuromuscular activity in the impaired limb, mirror visual feedback from the 'unaffected' less-impaired limb is required.

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14. Clin Neuropharmacol. 2011 Jul-Aug;34(4):135-6.

Persistent hiccups associated with switching from risperidone to aripiprazole in a schizophrenic patient with cerebral palsy.

Yeh YW.

Department of Psychiatry, Tri-Service General Hospital, National Defense Medical Center, Taipei, Taiwan.

Antipsychotics are thought to be effective in the treatment of hiccups; however, they are rarely reported to induce hiccups. We report a case of persistent hiccups after administration of aripiprazole in a patient with concurrence of schizophrenia and cerebral palsy. Prior brain injury and switching antipsychotics may precipitate the development of hiccups in the present case. Aripiprazole with a partial agonist of dopamine D2 receptors and serotonin 1A receptors may play a crucial role in the pathophysiology of hiccups.

PMID: 21768798 [PubMed - in process]

Epidemiology / Aetiology / Diagnosis & Early Treatment / Surveillance

15. Lancet Neurol. 2011 Aug;10(8):721-733.

The monoamine neurotransmitter disorders: an expanding range of neurological syndromes.

Kurian MA, Gissen P, Smith M, Heales SJ, Clayton PT.

Neurosciences Unit, UCL-Institute of Child Health, London UK; Department of Neurology, Great Ormond Street Hospital, London, UK.

The monoamine neurotransmitter disorders consist of a rapidly expanding heterogeneous group of neurological syndromes characterised by primary and secondary defects in the biosynthesis degradation, or transport of dopamine, norepinephrine, epinephrine, and serotonin. Disease onset can occur any time from infancy onwards. Clinical presentation depends on the pattern and severity of neurotransmitter abnormalities, and is predominated by neurological features (encephalopathy, epilepsy, and pyramidal and extrapyramidal motor disorders) that are primarily attributed to deficiency of cerebral dopamine, serotonin, or both. Many neurotransmitter disorders mimic the phenotype of other neurological disorders (eg, cerebral palsy, hypoxic ischaemic encephalopathy, paroxysmal disorders, inherited metabolic diseases, and genetic dystonic or parkinsonian syndromes) and are, therefore, frequently misdiagnosed. Early clinical suspicion and appropriate investigations, including analysis of neurotransmitters in CSF, are essential for accurate clinical diagnosis. Treatment strategies focus on the correction of monoamine deficiency by replacement of monoamine precursors, the use of monoamine analogues, inhibition of monoamine degradation, and addition of enzyme cofactors to promote monoamine production.

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16. Pediatrics. 2011 Jul 18. [Epub ahead of print]

Impact of Sepsis on Neurodevelopmental Outcome in a Swiss National Cohort of Extremely Premature Infants.

Schlapbach LJ, Aebischer M, Adams M, Natalucci G, Bonhoeffer J, Latzin P, Nelle M, Bucher HU, Latal B; the Swiss Neonatal Network and Follow-Up Group.

Neonatal and Pediatric ICU.

Objective: Neonatal sepsis causes high mortality and morbidity in preterm infants, but less is known regarding the long-term outcome after sepsis. This study aimed to determine the impact of sepsis on neurodevelopment at 2 years' corrected age in extremely preterm infants. Patients and Methods: This was a multicenter Swiss cohort study on infants born between 2000 and 2007 at 24 to 27 weeks' gestational age. Neurodevelopmental outcome was assessed with the Bayley Scales of Infant Development-II. Neurodevelopmental impairment (NDI) was defined as a Mental or Psychomotor Developmental Index lower than 70, cerebral palsy (CP), or visual or auditory impairment. Results: Of 541 infants, 136 (25%) had proven sepsis, 169 (31%) had suspected sepsis, and 236 (44%) had no signs of infection. CP occurred in 14 of 136 (10%) infants with proven sepsis compared with 10 of 236 (4%) uninfected infants (odds ratio [OR]: 2.90 [95% confidence interval (CI): 1.22-6.89]; P = .016). NDI occurred in 46 of 134 (34%) infants with proven sepsis compared with 55 of 235 (23%) uninfected infants (OR: 1.85 [95% CI: 1.12-3.05]; P = .016). Multivariable analysis confirmed that proven sepsis independently increased the risk of CP (OR: 3.23 [95% CI: 1.23-8.48]; P = .017) and NDI (OR: 1.69 [95% CI: 0.96-2.98]; P = .067). In contrast, suspected sepsis was not associated with neurodevelopmental outcome (P > .05). The presence of bronchopulmonary dysplasia, pathologic brain ultrasonography, retinopathy, and sepsis predicted the risk of NDI (P < .0001). Conclusions: Proven sepsis significantly contributes to NDI in extremely preterm infants, independent of other risk factors. Better strategies aimed at reducing the incidence of sepsis in this highly vulnerable population are needed.

PMID: 21768312 [PubMed - as supplied by publisher]

17. Indian J Pediatr. 2011 Jul 16. [Epub ahead of print]

Growth and Neurosensory Outcomes of Preterm Very Low Birth Weight Infants at 18 Months of Corrected Age.

Sharma PK, Sankar MJ, Sapra S, Saxena R, Karthikeyan CV, Deorari A, Agarwal R, Paul V.

Division of Neonatology, Department of Pediatrics, All India Institute of Medical Sciences, WHO Collaborating Centre for Training and Research, Ansari Nagar, New Delhi, 110029, India.

OBJECTIVE: To determine the growth and neurosensory outcomes of infants with birth weight ≤1,500 g or gestation ≤32 wks at 18 months corrected age. This prospective cohort study was conducted at a Level III neonatal unit in India. The neonates with birth weight ≤1,500 g or gestation ≤32 wks were included in the study. METHODS: The infants were followed up at 3,6,9,12 and 18 months corrected age. Weight, length and head circumference were plotted on WHO multisite growth reference study (MGRS) charts. Neurological examination was conducted by Amiel-Tison method, hearing was evaluated with brainstem auditory evoked responses, vision assessed with Teller acuity cards, and development assessed with Developmental Assessment Scales for Indian Infants II. RESULTS: During the period from July 2006 through June 2007, there were 141 neonates born at gestation ≤32 wks or birth weight ≤1,500 g. Seven infants had major malformations, 30 died before discharge, 36 had residence >20 km and parents of four had refused consent. The remaining 64 neonates were enrolled for follow up. The mean gestation and birth weight were 31(2.4) wks and 1208 (365) g respectively. There were 38 (59%) small for gestation infants. Fifty-five infants completed 18 months follow up for growth outcomes. Seventeen (30.9%; 95% CI 18.3% to 43.5%) infants were undernourished, 28(50.9%; 95% CI 37.3% to 64.6%) were stunted, 8(14.5%; 95% CI 0 to 24) were wasted and 14(25.4%; 95% CI 13.6% to 37.3%) had microcephaly. Infants with birth weight <1,000 g (n = 17) were significantly more affected. Ten (58.8%; p < 0.01) were undernourished, 13(76.5%; p < 0.01) were stunted and 10 (58.8%; p < 0.01) had microcephaly. Complete formal neurological evaluation for development, hearing and vision was done in 31 infants. Six of these 31 (19.3%; 95% CI 4.6% to 34.1%) infants had one or more major disabilities. These included cerebral palsy (n = 3), developmental delay (development quotient <70, n = 3), and deafness (n = 3). CONCLUSIONS: Very low birth weight infants are at a high risk of neurosensory disability and growth failure. There is a need to create a nation-wide database of these infants for neurodevelopment and growth outcomes.

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18. An Pediatr (Barc). 2011 Jul 19. [Epub ahead of print]

The Battelle developmental inventory screening test for early detection of developmental disorders in cerebral palsy.

[Article in Spanish]

Moraleda-Barreno E, Romero-López M, Cayetano-Menéndez MJ.

Servicio de Neuropsicología y Rehabilitación SEREN, Huelva, España; Departamento de Psicología Clínica, Experimental y Social, Facultad de Ciencias de la Educación, Universidad de Huelva, Huelva, España.

INTRODUCTION: Cerebral palsy is usually associated with motor, cognitive, and language deficits, and with other disorders that cause disability in daily living skills, personal independence, social interaction and academic activities. Early detection of these deficits in the clinical setting is essential to anticipate and provide the child with the necessary support for adapting to the environment in all possible areas. The main objective of this study is to demonstrate that these deficits can be detected at an early age and comprehensively through the use of a brief development scale. METHODS: We studied 100 children between 4 and 70 months old, half of them with cerebral palsy and the other half without any disorder. All subjects were evaluated using the Battelle Developmental Inventory screening test. We compared the developmental quotients in both groups and between the subjects with different motor impairments, using a simple prospective ex post facto design. RESULTS: The test detected statistically significant differences between the clinical group and the control group at all age levels. Statistically significant differences were also found between tetraplegia and other motor disorders. There were no differences by gender. DISCUSSION: The deficit in development associated with cerebral palsy can be quantified at early ages through the use of a brief development scale, thus we propose that the systematic implementation of protocols with this screening tool would be helpful for treatment and early intervention. This would also help in anticipating and

establishing the means for the multidisciplinary actions required, and could provide guidance to other health professionals, to provide adequate school, social, and family support.

PMID: 21778125 [PubMed - as supplied by publisher] Free full text

19. Indian J Pediatr. 2011 Jul 20. [Epub ahead of print]

Referral Profile of a Child Development Clinic in Northern India.

Juneja M, Jain R, Mishra D.

Child Development Clinic, Department of Pediatrics, Maulana Azad Medical College and associated Lok Nayak Hospital, Bahadur Shah Zafar Marg, New Delhi, 110002, India, drmonicajuneja@rediffmail.com.

OBJECTIVE: To delineate the demographic and clinical profile of children referred to a Child Development Clinic (CDC) of a tertiary care public hospital in India. METHODS: A retrospective review of medical records of all the cases referred to CDC in the year 2009 was conducted. RESULTS: Out of the 792 children referred to CDC, complete medical records were available in 641 cases, which comprised the study population. 66% were males and mean age at referral was 54.06 ± 44.4 months. 68.64% children had global developmental delay or mental retardation, majority (51.1%) of them having severe or profound retardation. 168 (26.2%) patients had various forms of cerebral palsy, with 39.3% being quadriplegics and 121 (18.9%) patients had pervasive developmental disorders. Only, 1.2% of cases had isolated motor delay and 2.9% had developmental language disorder. CONCLUSIONS: This study shows that in developing countries the proportion of children referred to CDC with severe disabling conditions is high and a significant proportion of these children have pervasive developmental disorders. This study provides baseline data for further planning of services for these children in the authors' region.

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20. Pediatr Neurol. 2011 Aug;45(2):89-94.

Factors affecting epilepsy development and epilepsy prognosis in cerebral palsy.

Gul Mert G, Incecik F, Altunbasak S, Herguner O, Kurthan Mert M, Kiris N, Unal I.

Department of Pediatrics, Cukurova University, Adana, Turkey.

A study was conducted between November 2006 and October 2009 to determine the factors predicting the presence and prognosis of epilepsy in patients with cerebral palsy. We enrolled 2 groups of patients: 42 with cerebral palsy in group 1 and 56 patients with cerebral palsy and epilepsy in group 2. The subjects in group 2 were considered to have good epilepsy prognosis if they were free of seizures for the previous year; otherwise they were considered to have poor epilepsy prognosis. In group 2, neonatal epilepsy, family history of epilepsy, and moderate to severe mental retardation were significantly higher than in group 1 ($P < 0.05$). In univariate analysis, neonatal seizures, epileptic activity as measured by electroencephalography, and polytherapy were found to be predictors of poor epilepsy prognosis. Additionally, the need for long-term medication to control seizures unfavorably affects prognosis. In logistic regression analysis, neonatal seizure and interictal epileptic activity in electroencephalography were found to be independent predictors of poor epilepsy outcome. In addition, logistic regression analysis revealed that increasing age reduces the success of epilepsy treatment. Neonatal seizures, family history of epilepsy, and mental retardation were found to be important and independent predictors of development of epilepsy in patients with cerebral palsy.

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21. Pediatrics. 2011 Jul 18. [Epub ahead of print]

Weight and Mortality Rates: "Gomez Classification" for Children With Cerebral Palsy?

Stevenson RD, Conaway MR.

Departments of Pediatrics (RDS) and Public Health Sciences (MRC), University of Virginia School of Medicine, University of Virginia, Charlottesville, Virginia.

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22. Pediatrics. 2011 Jul 18. [Epub ahead of print]

Low Weight, Morbidity, and Mortality in Children With Cerebral Palsy: New Clinical Growth Charts.

Brooks J, Day S, Shavelle R, Strauss D.

Life Expectancy Project, San Francisco, California.

Objective: To determine the percentiles of weight for age in cerebral palsy according to gender and Gross Motor Function Classification System (GMFCS) level and to identify weights associated with negative health outcomes. Patients and Methods: This study consists of a total of 102,163 measurements of weight from 25,545 children with cerebral palsy who were clients of the California Department of Developmental Services from 1988 through 2002. Percentiles were estimated using generalized additive models for location, scale, and shape. Numbers of comorbidities were compared using t tests. The effect of low weight on mortality was estimated with proportional hazards regression. Results: Weight-for-age percentiles in children with cerebral palsy varied with gender and GMFCS level. Comorbidities were more common among those with weights below the 20th percentile in GMFCS levels I through IV and level V without feeding tubes ($P < .01$). For GMFCS levels I and II, weights below the 5th percentile were associated with a hazard ratio of 2.2 (95% confidence interval: 1.3-3.7). For children in GMFCS levels III through V, weights below the 20th percentile were associated with a mortality hazard ratio of 1.5 (95% confidence interval: 1.4-1.7). Conclusions: Children with cerebral palsy who have very low weights have more major medical conditions and are at increased risk of death. The weight-for-age charts presented here may assist in the early detection of nutritional issues or other health risks in these children.

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