Cerebral Palsy ALLIANCE RESEARCH INSTITUTE

CP Research News

Monday 4 April 2011

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Interventions

1. Arch Phys Med Rehabil. 2011 Apr;92(4):640-5.

Measuring Mobility Limitations in Children With Cerebral Palsy: Rasch Model Fit of a Mobility Questionnaire, MobQues28.

Dallmeijer AJ, Scholtes VA, Becher J, Roorda LD.

Department of Rehabilitation Medicine and EMGO Institute for Health and Care Research, VU University Medical Centre, Amsterdam, The Netherlands.

OBJECTIVE: To develop a Rasch-based version of a mobility questionnaire (MobQues28) for children with cerebral palsy (CP). DESIGN: Cross-sectional study. SETTING: Private physical therapy practices and outpatient departments of hospitals and rehabilitation centers. PARTICIPANTS: Parents of 323 ambulatory children with CP (Gross Motor Function Classification System [GMFCS] level I-IV; aged, 2-13y).
INTERVENTIONS: Not applicable. MAIN OUTCOME MEASURE: The mobility questionnaire measures mobility limitations in children with CP by rating the difficulty of executing 47 mobility activities, as reported by the parents. Items for the Rasch-based version were selected based on fit to the Rasch measurement (partial credit) model and invariance of item characteristics across GMFCS level, age group, or sex. RESULTS: Analysis revealed a fitting model when nonambulant and/or 2- and 3-year aged children were excluded (leaving a final sample of n=246) and answering categories were collapsed from 9 to 5. Thirteen items were removed from the questionnaire due to misfit to the model, 5 because of disordered thresholds, and 1 because of invariance across age group. Twenty-eight items out of the original 47 items showed good fit to the model. CONCLUSIONS: The 28-item version of the mobility questionnaire (MobQues28) provides sound measurement properties for measuring mobility limitations in ambulant children with CP, aged 4 to 13 years, and shows promise as an instrument for research purposes.

PMID: 21440711 [PubMed - in process]

2. Clin Orthop Relat Res. 2011 Mar 29. [Epub ahead of print]

Better Walking Performance in Older Children With Cerebral Palsy.

Rodby-Bousquet E, Hägglund G.

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BACKGROUND: Children with cerebral palsy (CP) often walk with a slower speed and a higher energy cost. Their walking performance and choice of mobility method may vary in different environments. Independent mobility is

important for activity and participation. QUESTIONS/PURPOSES: We described walking performance at different distances and environments in relation to gross motor function, CP subtype, and age. PATIENTS AND METHODS: We performed a cross-sectional study including all 562 children 3 to 18 years with CP living in southern Sweden during 2008. Data were extracted from a Swedish CP register and healthcare program. The Functional Mobility Scale (FMS) was used for rating mobility at home (5 m), at school (50 m), and in the community (500 m). The FMS scores were analyzed in relation to Gross Motor Function Classification System (GMFCS) level, CP subtype, and age. RESULTS: In this population, 57% to 63% walked 5 to 500 m without walking aids and 4% to 8% used walking aids. We found a correlation between FMS and GMFCS. The walking performance varied between the subtypes from 96% to 98% in those with spastic unilateral CP to 16% to 24% in children with dyskinetic CP. An increased proportion of children walked independently on all surfaces in each successive age group. CONCLUSIONS: The overall walking performance increased up to 7 years of age, but the proportion of children walking independently on uneven surfaces was incrementally higher in each age group up to 18 years. The ability to walk on uneven surfaces is important for achieving independent walking in the community.

PMID: 21445713 [PubMed - as supplied by publisher]

3. Gait Posture. 2011 Mar 30. [Epub ahead of print]

Pelvic kinematics and their relationship to gait type in hemiplegic cerebral palsy.

Salazar-Torres JJ, McDowell BC, Kerr C, Cosgrove AP.

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While there is general clinical consensus that children with Unilateral Spastic Cerebral Palsy (USCP) walk with an increased anterior pelvic tilt and the affected hemipelvis retracted, there is less agreement to observations in the coronal plane. Furthermore, the relationship of 3D pelvic kinematic parameters to the Winters, Gage and Hicks (WGH) hemiplegic gait classification has not been reported in the literature. Valid 3-D kinematic gait data were obtained in a representative population of 91 children with hemiplegia (56M, mean age 10.8yrs, age range 5-18yrs; WGH classification Type I n=32, II n=5, III n=7, IV n=9, unclassified n=38). Deviations of symmetry and range of movement from our normative data set (n=48; 26F; mean age 9.9yrs; age range 5-18yrs) for mean tilt, tilt range, and difference between affected and unaffected sides for obliquity and rotation were defined as normal, mild, moderate or severe (<1 standard deviation (SD); >1<2SD; >2<3SD; >3SD, respectively). Increased pelvic tilt range (>1SD) was observed in 60.4% and pelvic retraction (>1SD) was observed in 61.5% of USCP children in this study. Weak but significant correlations were found between WGH gait type and pelvic obliquity (ρ=0.29; $p<0.01$). No other correlations were found. Factors such as leg length discrepancy modify the functional leg length throughout the gait cycle contributing to the deviations observed. The evaluation of gait abnormalities in USCP should not be limited to the use of classifications based on sagittal plane kinematics but should seek to include 3D kinematics of the pelvis.

PMID: 21454079 [PubMed - as supplied by publisher]

4. Gait Posture. 2011 Mar 29. [Epub ahead of print]

The GDI-Kinetic: A new index for quantifying kinetic deviations from normal gait.

Rozumalski A, Schwartz MH.

Gillette Children's Specialty Healthcare, St. Paul, MN, United States; University of Minnesota Dept. Biomedical Engineering, Minneapolis, MN, United States.

This article introduces a new index, the GDI-Kinetic; a direct analog of the GDI based on joint kinetics rather than kinematics. The method consists of: (1) identifying "features" of the raw gait kinetic data using singular value decomposition, (2) identifying a subset of features that account for a large percentage of the information in the raw gait kinetic data, (3) expressing the raw data from a group of typically developing children as a linear combination of

these features, (4) expressing a subject's raw data as a linear combination of these features, (5) calculating the magnitude of the difference between the subject and the mean of the control, and (6) scaling and transforming the difference, in order to provide a simple, and statistically well-behaved, measure. Linear combinations of the first 20 gait features produced a 91% faithful reconstruction of the data. Concurrent and face validity for the GDI-Kinetic are presented through comparisons with the GDI, Gillette Functional Assessment Questionnaire Walking Scale (FAQ), and topographic classifications within the diagnosis of Cerebral Palsy (CP). The GDI-Kinetic and GDI are linearly related but not strongly correlated (r(2)=0.24). Like the GDI, the GDI-Kinetic scales with FAQ level, distinguishes levels from one another, and is normally distributed across FAQ levels six to ten, and among typically developing children. The GDI-Kinetic also scales with respect to clinical involvement based on topographic CP classification in Hemiplegia types I-IV, Diplegia, Triplegia, and Quadriplegia. The GDI-Kinetic complements the GDI in order to give a more comprehensive measure of gait pathology.

PMID: 21454078 [PubMed - as supplied by publisher]

5. J Rehabil Med. 2011 Mar;43(4):330-7.

Level of activity and participation in adults with spastic diplegia 17-26 years after selective dorsal rhizotomy.

Langerak NG, Hillier SL, Verkoeijen PP, Peter JC, Fieggen AG, Vaughan CL.

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OBJECTIVE: To evaluate the activity and participation levels of adults with spastic diplegia 17-26 years after selective dorsal rhizotomy; to investigate relationships between subjects' functioning and age, socio-economic-status, level of satisfaction and their perceptions of the post-operative outcomes. DESIGN: Observational follow-up study. PATIENTS: Thirty-one subjects with spastic diplegia, age range 21-44 years, who underwent selective dorsal rhizotomy between 1981 and 1991. METHODS: A semi-structured interview was used to gather data on patients' characteristics and long-term experiences after the operation. The Functional Mobility Scale and Life-Habit questionnaire were completed. RESULTS: Based on the Functional Mobility Scale 84% of subjects were reported as independent for a distance of 5 m, and 61% for 50 and 500 m. Eighty percent were independent in accomplishing all life habits, with most problems found for Mobility and Recreation. This was in agreement with the subjects' perception, with strong correlations between Life-Habit questionnaire accomplishment and satisfaction levels. No significant associations were found between functioning and age at selective dorsal rhizotomy, current age and socio-economic status. CONCLUSION: More than 15 years after selective dorsal rhizotomy, adults with spastic diplegia showed high levels of functioning, and similar levels of satisfaction with life habits. The majority had positive feelings about the neurosurgical procedure, although there is a need for better follow-up after subjects leave school.

PMID: 21327322 [PubMed - indexed for MEDLINE]

6. Eur J Appl Physiol. 2011 Mar 26. [Epub ahead of print]

Validity of accelerometry in ambulatory children and adolescents with cerebral palsy.

Clanchy KM, Tweedy SM, Boyd RN, Trost SG.

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To evaluate the validity of the ActiGraph accelerometer for the measurement of physical activity intensity in children and adolescents with cerebral palsy (CP) using oxygen uptake (VO(2)) as the criterion measure. Thirty children and adolescents with CP (mean age 12.6 ± 2.0 years) wore an ActiGraph 7164 and a Cosmed K4b(2) portable indirect calorimeter during four activities; quiet sitting, comfortable paced walking, brisk paced walking and fast paced walking. VO(2) was converted to METs and activity energy expenditure and classified as sedentary, light or moderate-to-vigorous intensity according to the conventions for children. Mean ActiGraph counts min(-1) were classified as

sedentary, light or moderate-to-vigorous (MVPA) intensity using four different sets of cut-points. VO(2) and counts min(-1) increased significantly with increases in walking speed (P < 0.001). Receiver operating characteristic (ROC) curve analysis indicated that, of the four sets of cut-points evaluated, the Evenson et al. (J Sports Sci 26(14):1557-1565, 2008) cut-points had the highest classification accuracy for sedentary (92%) and MVPA (91%), as well as the second highest classification accuracy for light intensity physical activity (67%). A ROC curve analysis of data from our participants yielded a CP-specific cut-point for MVPA that was lower than the Evenson cut-point (2,012 vs. 2,296 counts min(-1)), however, the difference in classification accuracy was not statistically significant 94% (95% CI = 88.2-97.7%) vs. 91% (95% CI = 83.5-96.5%). In conclusion, among children and adolescents with CP, the ActiGraph is able to differentiate between different intensities of walking. The use of the Evenson cut-points will permit the estimation of time spent in MVPA and allows comparisons to be made between activity measured in typically developing adolescents and adolescents with CP.

PMID: 21442163 [PubMed - as supplied by publisher]

7. J Anat. 2011 Mar 31. doi: 10.1111/j.1469-7580.2011.01365.x. [Epub ahead of print]

Validity and reliability of a simple ultrasound approach to measure medial gastrocnemius muscle length.

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Fixed shortening of a muscle, or contracture, often develops in individuals with an upper motor neuron disorder. A clinical measure of muscle length would therefore be useful for identifying the presence of muscle contracture, tracking changes over time and evaluating the effect of interventions. This study compared a novel ultrasound-tape length method with a previously validated freehand 3D ultrasound method for measuring muscle length. The ultrasound-tape method intra-session reliability was also assessed. Resting medial gastrocnemius muscle length was measured at three ankle joint angles in 15 typically developed (TD) adults and nine adults with cerebral palsy (CP) using the two methods. The ultrasound-tape method on average overestimated the muscle length in the TD group by < 0.1% (95% CI, 6%) and underestimated in the muscle length in the CP group by 0.1% (95% CI, 6%) compared with the 3D ultrasound method. Intra-session reliability of the ultrasound-tape method was high, with intra-class correlation coefficients > 0.99. The ultrasound-tape method has sufficient accuracy to detect clinically relevant differences and changes in medial gastrocnemius muscle length and may therefore be a useful clinical tool for assessing muscle length changes associated with contracture.

PMID: 21450014 [PubMed - as supplied by publisher]

8. Hum Mov Sci. 2011 Mar 29. [Epub ahead of print]

Anticipatory and compensatory postural adjustments in sitting in children with cerebral palsy.

Bigongiari A, de Andrade E Souza F, Franciulli PM, Neto SE, Araujo RC, Mochizuki L.

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The aim of this study was to examine postural control in children with cerebral palsy performing a bilateral shoulder flexion to grasp a ball from a sitting posture. The participants were 12 typically developing children (control) without cerebral palsy and 12 children with cerebral palsy (CP). We analyzed the effect of ball mass (1kg and 0.18kg), postural adjustment (anticipatory, APA, and compensatory, CPA), and groups (control and CP) on the electrical activity of shoulder and trunk muscles with surface electromyography (EMG). Greater mean iEMG was seen in CPA, with heavy ball, and for posterior trunk muscles ($p<.05$). The children with CP presented the highest EMG and level of co-activation ($p<.05$). Linear regression indicated a positive relationship between EMG and aging for the control group, whereas that relationship was negative for participants with CP. We suggest that the main postural control strategy in children is based on corrections after the beginning of the movement. The linear relationship between EMG and aging suggests that postural control development is affected by central nervous disease which may lead

to an increase in muscle co-activation.

PMID: 21453981 [PubMed - as supplied by publisher]

9. NeuroRehabilitation. 2011 Jan 1;28(2):81-3.

Preoperative treatment with Botulinum Toxin A before total hip arthroplasty in a patient with tetraspasticity: Case report and review of literature.

Eibach S, Krug H, Lobsien E, Hoffmann KT, Kupsch A.

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We report on a patient with tetraspasticity due to perinatal cerebral palsy requiring total hip joint endoprosthesis because of hip dysplasia. In order to minimize the risk of postoperative luxation Botulinum Toxin A was injected preoperatively into hip flexor and adductor muscles guided by CT-fluoroscopy. Outcome measures included muscle tone, limb position and self-reported pain relief. Seven days post injections the tone of the right hip flexor and adductor muscles improved from three to one points on the five-point Modified Ashworth Scale (MAS), the spastic joint position improved from 45° to 20° in flexion and from 20° to 10° in adduction, and the patient was free of pain. Ten days after injection of Botulinum Toxin operation of total hip joint arthroplasty was performed without complication. Improvement of spasticity sustained for another eight weeks. Subsequent Botulinum Toxin A injection three months post surgery resulted in identical results. This case demonstrates a new preoperative indication for Botulinum Toxin A in patients with an increased muscle tone at the hip who have to undergo total hip joint endoprosthesis to reduce the risk of postoperative luxation.

PMID: 21447907 [PubMed - in process]

10. Arch Phys Med Rehabil. 2011 Apr;92(4):578-84.

Best responders after intensive upper-limb training for children with unilateral cerebral palsy.

Sakzewski L, Ziviani J, Boyd RN.

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OBJECTIVE: To delineate characteristics of best responders in a randomized trial comparing constraint-induced movement therapy (CIMT) to bimanual training for children with unilateral cerebral palsy. DESIGN: Secondary analysis of a single-blind matched-pairs randomized comparison trial. SETTING: Community sporting facilities in 2 Australian capital cities. PARTICIPANTS: Children (n=64; mean age, 10.2±2.7y; 52% boys), matched for age, sex, side of hemiplegia, and upper-limb function, were randomized within pairs to CIMT or bimanual training. Sixty-one children who completed CIMT (n=31) or bimanual training (n=30) were included in this study. INTERVENTIONS: Each intervention was delivered in day camps (total 60h over 10d) using a novel circus theme with goal-directed training. MAIN OUTCOME MEASURES: Change between baseline, 3, and 26 weeks on the Melbourne Assessment of Unilateral Upper Limb Function (MUUL>7.4%), Assisting Hand Assessment (AHA>4 raw score points), and Canadian Occupational Performance Measure (COPM>2 points) defined best responders. RESULTS: Poorer baseline hand function predicted a best response for unimanual capacity of the impaired upper limb (MUUL) immediately post intervention; however, at 26 weeks the odds of achieving a favorable outcome were 21 times greater for CIMT than bimanual training. A favorable response for bimanual performance (AHA) was predicted by immediate change in Jebsen-Taylor hand function test scores. Age (older), left-sided hemiplegia, and lower-baseline COPM performance scores significantly predicted favorable individualized outcomes. CONCLUSIONS: Secondary analysis of a randomized trial directly comparing 2 upper-limb training models, found children with poorer hand function benefited most. Favorable outcomes for bimanual performance were associated with gains in movement

efficiency and older children with left-sided hemiplegia achieved more favorable gains in perceived occupational performance.

PMID: 21440702 [PubMed - in process]

11. Arch Phys Med Rehabil. 2011 Apr;92(4):531-9.

Participation outcomes in a randomized trial of 2 models of upper-limb rehabilitation for children with congenital hemiplegia.

Sakzewski L, Ziviani J, Abbott DF, Macdonell RA, Jackson GD, Boyd RN.

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OBJECTIVE: To determine if constraint-induced movement therapy (CIMT) is more effective than bimanual training to improve occupational performance and participation in children with congenital hemiplegia. DESIGN: Single-blind randomized comparison trial with evaluations at baseline, 3, and 26 weeks. SETTING: Community facilities in 2 Australian states. PARTICIPANTS: Referred sample of children (N=64; mean age ± SD, 10.2±2.7y, 52% boys) were matched for age, sex, side of hemiplegia, and upper-limb function and were randomized to CIMT or bimanual training. After random allocation, 100% of CIMT and 94% of the bimanual training group completed the intervention. INTERVENTIONS: Each intervention was delivered in day camps (total 60h over 10d) using a circus theme with goal-directed training. Children receiving CIMT wore a tailor-made glove during the camp. MAIN OUTCOME MEASURES: The primary outcome was the Canadian Occupational Performance Measure (COPM). Secondary measures included the Assessment of Life Habits (LIFE-H), Children's Assessment of Participation and Enjoyment, and School Function Assessment. RESULTS: There were no between-group differences at baseline. Both groups made significant changes for COPM performance at 3 weeks (estimated mean difference =2.9; 95% confidence interval [CI], 2.3-3.6; P<.001 for CIMT; estimated mean difference=2.8; 95% CI, 2.2-3.4; P<.001 for bimanual training) that were maintained at 26 weeks. Significant gains were made in the personal care LIFE-H domain following CIMT (estimated mean difference=0.5; 95% CI, 0.1-0.9; P=.01) and bimanual training (estimated mean difference=0.6; 95% CI, 0.2-1.1; P=.006). CONCLUSIONS: There were minimal differences between the 2 training approaches. Goal-directed, activity-based, upper-limb training, addressed through either CIMT or bimanual training achieved gains in occupational performance. Changes in participation on specific domains of participation assessments appear to correspond with identified goals.

PMID: 21440700 [PubMed - in process]

12. Disabil Rehabil. 2011 Mar 30. [Epub ahead of print]

Development of handwriting skill in children with unilateral cerebral palsy (CP).

Tükel Kavak S, Eliasson AC.

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Aim. To investigate the development of handwriting, fine motor skills and school marks in children with unilateral cerebral palsy (CP) and relate the performance in handwriting skill to age and IQ at a 16-month follow-up. Method. Data from 16 children (5 females, 11 males; mean age 11 years 4 months, SD 1 year 6 months, range 8-13 years) with left-sided hemiplegia were collected. The Minnesota Handwriting Assessment (MHA) for handwriting skill, the Bruininks-Oseretsky Test of Motor Proficiency (BOTMP) for fine motor skills, the Wechsler Intelligence Scale for Children Revised (WISC-R) for IQ, the Manual Ability Classification System (MACS) and school marks of children were used. Results. Handwriting quality, handwriting speed and fine motor skills improved over 16 months but the

children with unilateral CP still performed below their peers. School marks did not change. The regression model (Adj. R(2) = 0.76) revealed that age and IQ were negatively correlated and good predictors for the improvement in handwriting quality. No relationship was found between handwriting speed and age or IQ. Conclusion. Children with unilateral CP continued to develop handwriting skill over a longer time period than expected. Age and IQ predicted the rate of development in handwriting quality. Children kept up school marks despite the increasing demands of the succeeding grade.

PMID: 21446885 [PubMed - as supplied by publisher]

13. Conf Proc IEEE Eng Med Biol Soc. 2010;2010:2678-81.

Application of system identification methods for decoding imagined single-joint movements in an individual with high tetraplegia.

Ajiboye AB, Hochberg LR, Donoghue JP, Kirsch RF.

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This study investigated the decoding of imagined arm movements from M1 in an individual with high level tetraplegia. The participant was instructed to imagine herself performing a series of single-joint arm movements, aided by the visual cue of an animate character performing these movements. System identification was used offline to predict the trajectories of the imagined movements and compare these predictions to the trajectories of the actual movements. We report rates of 25 - 50% for predicting completely imagined arm movements in the absence of a priori movements to aid in decoder building.

PMID: 21096197 [PubMed - indexed for MEDLINE]

Epidemiology / Aetiology / Diagnosis & Early Treatment

14. Child Care Health Dev. 2011 Mar 28. doi: 10.1111/j.1365-2214.2011.01233.x. [Epub ahead of print]

Comparison of the prevalence and impact of health problems of pre-school children with and without cerebral palsy.

Wong C, Bartlett DJ, Chiarello LA, Chang HJ, Stoskopf B.

Faculty of Health Sciences, McMaster University CanChild Centre for Childhood Disability Research, McMaster University, Hamilton School of Physical Therapy, The University of Western Ontario, London, ON, Canada Physical Therapy and Rehabilitation Sciences, Drexel University, Philadelphia, PA, USA.

Background: The range of health problems associated with children with cerebral palsy (CP) is well documented in the literature; however, the existing data are often either reported for samples of children with all types of CP, or stratified by typology of motor disorder, rather than using the Gross Motor Function Classification System (GMFCS), which has been shown to be the most reliable way of classifying children with CP. Furthermore, availability of research on pre-school-aged children (under 5 years) is sparse. The aim of this study is to compare the prevalence and impact of health problems in pre-school children with and without CP, stratified by the GMFCS. Methods: Parents of 430 pre-school-aged children with CP (243 boys, 187 girls; mean age = 3 years 2 months, SD = 11 months) and 107 typically developing (TD) children (56 boys, 51 girls; mean age = 3 years 4 months, SD = 11 months) participated. Using the consensus definition of CP and the World Health Organization's International Classification of Functioning, Disability and Health, a parent survey was developed to assess the prevalence and impact of 16 health problems. The measure demonstrates good test-retest reliability (ICC > 0.80) and discriminant validity across GMFCS levels (P < 0.001). Results: Both the prevalence and impact of health problems is greater in children with CP compared with TD children (P < 0.001). The number and impact of health problems increase with ascending GMFCS level (P≤ 0.01), except for the impact of health problems between groups GMFCS I and GMFCS II/III (P= 0.19). Children with CP have an average of between 3.4 and 6.7 health problems, compared with fewer than one in TD children. Conclusions: Service providers working with pre-school-aged children with CP need to

consider health problems and their impact when planning care.

PMID: 21443556 [PubMed - as supplied by publisher]

15. Intellect Dev Disabil. 2011 Apr;49(2):59-85.

Prevalence of chronic health conditions in children with intellectual disability: a systematic literature review.

Oeseburg B, Dijkstra GJ, Groothoff JW, Reijneveld SA, Jansen DE.

A systematic review of the prevalence rates of chronic health conditions in populations of children with intellectual disability was provided. We identified 2,994 relevant studies by searching Medline, Cinahl, and PsycINFO databases from 1996 to 2008. We included the 31 studies that had sufficient methodological quality. The 6 most prevalent chronic health conditions in children with intellectual disability were epilepsy (22.0/100), cerebral palsy (19.8/100), any anxiety disorder (17.1/100), oppositional defiant disorder (12.4/100), Down syndrome (11.0/100), and autistic disorder (10.1/100). The reported prevalence rates of chronic health conditions in this population was much higher than in the general population. However, both the number of studies that were included and the number of chronic health conditions they reported about were limited. There is an urgent need for better evidence on the prevalence of chronic health conditions among children with intellectual disability.

PMID: 21446871 [PubMed - in process]

16. Med Pregl. 2010 Jul-Aug;63(7-8):527-30.

Cerebral palsy and epilepsy [Article in Serbian]

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INTRODUCTION: Cerebral palsy is the most common cause of physical disability in early childhood. Epilepsy is known to have a high association with cerebral palsy. All types of epileptic seizures can be seen in patients with cerebral palsy. Complex partial and secondary generalized ones are the most frequent seizure types. In persons with cerebral palsy and mental retardation, the diagnosis of epilepsy presents unique difficulties. Generally they are not able to describe the epileptic events themselves, parents are not able to describe them without fear and persons trained in epilepsy witness the events only rarely. Some syndromes, such as infantile spasms. West and Lennox-Gastaut syndrome, are particularly frequent, whereas children with cerebral palsy are rarely free of epilepsy. It has been observed that epileptic seizures in children with cerebral palsy tend to have an earlier onset; they often appear in children with cerebral palsy and mental retardation; they are more severe in patients with a more severe degree of cerebral palsy. The overall outcome of seizures in children with cerebral palsy is poor, requiring prolonged course of antiepileptic medications, polytherapy with higher incidence of refractory seizures and hospital admissions for status epilepticus. The presence of a neurological deficit, as well as cerebral palsy, does not necessarily mean a poor prognosis after the discontinuation of antiepileptic drugs, but the risk of a relapse in persons with cerebral palsy is high. AIM: The objective of the paper was to show the relationship between cerebral palsy and epilepsy and to determine the occurrence, associated factors, nature and prognosis of epilepsy in children with cerebral palsy.

PMID: 21446143 [PubMed - in process]

17. Pediatrics. 2011 Mar 28. [Epub ahead of print]

Evidence Suggests There Was Not a "Resurgence" of Kernicterus in the 1990s.

Brooks JC, Fisher-Owens SA, Wu YW, Strauss DJ, Newman TB.

Life Expectancy Project, San Francisco, California;

Background: Although some have suggested that kernicterus disappeared in the United States in the 1970s to 1980s and dramatically reappeared in the 1990s, population-based data to support such a resurgence are lacking. Methods: We used diagnosis codes on data collection forms from the California Department of Developmental Services (DDS) to identify kernicterus cases among children born from 1988 to 1997. We examined kernicterus mortality trends in the United States from 1979 to 2006 using death certificate data from the National Center for Health Statistics. Results: We identified 25 cases of physician-diagnosed kernicterus. This figure was augmented to reflect estimates of cases lost to infant mortality, yielding incidence estimates of 1 in 200 000 California live births, 1 in 2500 among children who received services from DDS, and 1 in 400 children with cerebral palsy. There was no significant trend in kernicterus incidence from 1988 to 1997 (P = .77). Incidence before and after the 1994 publication of the AAP practice parameter for hyperbilirubinemia in healthy term infants was not significantly different (P = .92). Nationally, there were 3 reported infant deaths from kernicterus in 1994 and 2 or fewer in the other 28 years from 1979 to 2006 (0.28 deaths per million live births): there was no significant increase in kernicterus mortality over this period. Conclusions: Data from California do not support a resurgence of kernicterus in the 1990s. Deaths from kernicterus in the United States have remained rare, with no apparent increase during the last 25 years.

PMID: 21444599 [PubMed - as supplied by publisher]

18.J Biomol Tech. 2011 Apr;22(1):5-9.

Comparison of DNA Extraction Methods from Small Samples of Newborn Screening Cards Suitable for Retrospective Perinatal Viral Research.

McMichael GL, Highet AR, Gibson CS, Goldwater PN, O'Callaghan ME, Alvino ER, Maclennan AH; for the South Australian Cerebral Palsy Research Group.

Reliable detection of viral DNA in stored newborn screening cards (NSC) would give important insight into possible silent infection during pregnancy and around birth. We sought a DNA extraction method with sufficient sensitivity to detect low copy numbers of viral DNA from small punch samples of NSC. Blank NSC were spotted with seronegative EDTA-blood and seropositive EBV EDTA-blood. DNA was extracted with commercial and noncommercial DNA extraction methods and quantified on a spectrofluorometer using a PicoGreen dsDNA quantification kit. Serial dilutions of purified viral DNA controls determined the sensitivity of the amplification protocol, and seropositive EBV EDTA-blood amplified by nested PCR (nPCR) validated the DNA extraction methods. There were considerable differences between the commercial and noncommercial DNA extraction methods (P=0.014; P=0.016). Commercial kits compared favorably, but the QIamp DNA micro kit with an added forensic filter step was marginally more sensitive. The mean DNA yield from this method was 3 ng/µl. The limit of detection was 10 viral genome copies in a 50-µl reaction. EBV nPCR detection in neat and 1:10 diluted DNA extracts could be replicated reliably. We conclude that the QIamp Micro DNA extraction method with the added forensic spin-filter step was suitable for retrospective DNA viral assays from NSC.

PMID: 21455476 [PubMed - as supplied by publisher]

19. Adv Med Sci. 2011 Mar 28:1-7. [Epub ahead of print]

Schizencephaly as a cause of spastic cerebral palsy.

Kułak W, Okurowska-Zawada B, Gościk E, Sienkiewicz D, Paszko-Patej G, Kubas B.

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Purpose: The objective was to investigate the clinical features of schizencephaly in children with spastic cerebral

palsy. Material and methods: The present study included 180 children with cerebral palsy, spastic tetraplegia, diplegia, and hemiplegia. All magnetic resonance (MR) scans were obtained using a 1.5 T MR scanner with the use of a standard circularly polarized head coil. Results: Significant abnormalities relevant to cerebral palsy were evident on MRI in 95%. Periventicular leukomalacia was detected more frequently in children with spastic diplegia than in other patients. Cerebral atrophy was found more often in tetraplegic patients. Porencephalic cysts were detected more often in children with spastic hemiplegia. Congenital brain anomalies were evident in 20 (11.1%) children with spastic cerebral palsy. Twelve patients had schizencephaly with cerebral palsy. Children with spastic diplegia and tetraplegia had bilateral schizencephaly; patients with spastic hemiplegia only had unilateral schizencephaly. Most patients with schizencephaly had epilepsy. Conclusions: Schizencephaly occurred more often in patients with spastic hemiplegia. Early detection of brain abnormalities in children with cerebral palsy may help in the prognosis and in the introduction of appropriate therapy.

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20. Pharmacol Biochem Behav. 2011 Mar 25. [Epub ahead of print]

Glutamate signaling in the pathophysiology and therapy of prenatal insults.

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Birth asphyxia and hypoxia-ischemia (HI) is an important factor affecting the normal development and maturation of the central nervous system (CNS). Depending on the maturity of the brain, HI-induced damage at different ages is region-selective, the white matter (WM) peripheral to the lateral ventricles being selectively vulnerable to damage in premature infants. As a squeal of primary or secondary HI in the preterm infant, the brain injury comprises periventricular leukomalasia (PVL), accompanied by neuronal and axonal damage, which affects several brain regions. Premature delivery and improved neonatal intensive care have led to a survival rate of about 75% to 90% of infants weighting under 1500g both in Europe and in the United States. However, about 5-10% of these survivors exhibit cerebral palsy (CP), and many have cognitive, behavioral, attentional or socialization deficits. In this review, we first shortly discuss developmental changes in the expression of the excitatory glutamate receptors (GluRs), and then in more detail elucidate the contribution of GluRs to oligodendrocyte (OL) damage both in experimental models and in preterm human infants. Finally, therapeutic interventions targeted at GluRs at the young age are discussed in the light of results obtained from recent experimental HI animal models and from humans.

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21. Ugeskr Laeger. 2011 Mar 28;173(13):962-965.

Evidence exists for prophylactic magnesium sulphate as a neuroprotector in premature births. [Article in Danish]

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Preterm birth increases the child's risk of cerebral palsy. Observational studies as well as randomized studies find that magnesium sulphate given to women in preterm birth decreases such risk. A Cochrane meta-analysis of the randomized studies shows no change in mortality, whereas some observational studies find a mortality decrease. It is important to identify the neuroprotective mechanism and to decide whether these results are relevant in the current Danish obstetrical practice. Should we use magnesium sulphate now or should questions about doses, time of administration and maternal side effects be answered first?

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