Cerebral Palsy Alliance

NEWS
Cerebral Palsy Research

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Interventions and Management

1. Neurorehabil Neural Repair. 2015 Apr 28. pii: 1545968315583723. [Epub ahead of print]

Reliability and Responsiveness of Upper Limb Motor Assessments for Children With Central Neuromotor Disorders: A Systematic Review.

Gerber CN1, Labruyère R2, van Hedel HJ2.

BACKGROUND: To investigate the effectiveness of upper limb rehabilitation, sound measures of upper limb function, capacity, and performance are paramount. OBJECTIVES: This systematic review investigates reliability and responsiveness of upper limb measurement tools used in pediatric neurorehabilitation. METHODS: A 2-tiered search was conducted up to July 2014. The first search identified upper limb motor assessments for 1- to 18-year-old children with neuromotor disorders. The second search examined the psychometric properties of the tools. Methodological quality was rated according to COSMIN guidelines, and results for each tool were assembled in a "best evidence synthesis." Furthermore, we delineated whether tools were unimanual or bimanual tests and if they measured recovery or did not distinguish between physiological and compensatory movements. RESULTS: The first search delivered 2546 hits. Of these, 110 articles on 51 upper limb assessment tools were included. The second search resulted in 58 studies on reliability, 11 on measurement error, and 10 on responsiveness. Best evidence synthesis revealed only 2 assessments with moderate positive evidence for reliability, whereas no evidence on measurement error and responsiveness was found. The Melbourne Assessment showed moderate positive evidence for interrater and a fair positive level of evidence for intrarater reliability. The Pediatric Motor Activity Log Revised revealed moderate positive evidence for test-retest reliability. CONCLUSIONS: There is a lack of high-quality studies about psychometric properties of upper limb measurement tools in children with neuromotor disorders. To date, upper limb rehabilitation trials in children and adolescents risk being biased by insensitive measurement tools lacking reliability.

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PMID: 25921350 [PubMed - as supplied by publisher]

2. J Clin Neurosci. 2015 Apr 23. pii: S0967-5868(15)00141-1. doi: 10.1016/j.jocn.2015.03.004. [Epub ahead of print]

Treatment of os odontoideum in a patient with spastic quadriplegic cerebral palsy.

Akpolat YT1, Fegale B2, Cheng WK3.

Severe atlantoaxial instability due to os odontoideum in a patient with spastic cerebral palsy has not been well

described. There is no consensus on treatment, particularly with regard to conservative or surgical options. Our patient was a 9-year-old girl with spastic cerebral palsy and unstable os odontoideum as an incidental finding. During the waiting period for elective surgical treatment, the patient developed respiratory compromise. Surgery was performed to reduce the subluxation and for C1-C2 arthrodesis and the girl regained baseline respiratory function. A CT scan was obtained 1year after the initial surgery and revealed adequate maintenance of reduction and patency of the spinal canal. This patient highlights the fact that unstable os odontoideum can cause mortality due to respiratory distress in patients with spastic cerebral palsy. This is an important factor in deciding treatment options for cerebral palsy patients with low functional demand. We review the relevant literature.

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PMID: 25913747 [PubMed - as supplied by publisher]

3. Dev Med Child Neurol. 2015 Apr 28. doi: 10.1111/dmcn.12766. [Epub ahead of print]

Variation in kinematic and spatiotemporal gait parameters by Gross Motor Function Classification System level in children and adolescents with cerebral palsy.

Õunpuu S1, Gorton G, Bagley A, Sison-Williamson M, Hassani S, Johnson B, Oeffinger D.

AIM: The aim of this study was to examine differences in gait kinematics and spatiotemporal parameters in ambulatory children and adolescents with bilateral spastic cerebral palsy (BSCP) among Gross Motor Function Classification System (GMFCS) levels I-III. METHOD: A retrospective review was conducted of individuals with BSCP who had three-dimensional motion analysis (3DGA) at one of seven pediatric hospitals. Means and standard deviations of each gait parameter were stratified by GMFCS levels (I-III) and for a typically developing comparison group. RESULTS: Data from 292 children and adolescents with BSCP (189 males, 103 females; mean age 13y) were compared to a typically developing comparison group (24 male, 26 female; mean age 10y 6mo). Gait patterns differed from typically developing in all GMFCS levels, with increasing deviation as GMFCS level increased in 21 out of 28 parameters. Despite significant differences in selected mean kinematic parameters among GMFCS levels such as knee angle at initial contact of 24°, 29°, and 41° in GMFCS levels I, II and III respectively, there was also substantial overlap among GMFCS levels. INTERPRETATION: GMFCS levels cannot be identified using specific gait kinematics. Treatment decisions should be guided by comprehensive 3DGA that allows measurement of gait impairments at the joint level for each individual.

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PMID: 25926016 [PubMed - as supplied by publisher]

4. Gait Posture. 2015 Apr 13. pii: S0966-6362(15)00431-2. doi: 10.1016/j.gaitpost.2015.04.001. [Epub ahead of print]

Children with cerebral palsy effectively modulate postural control to perform a supra-postural task.

Schmit J1, Riley M2, Cummins-Sebree S3, Schmitt L4, Shockley K5.

The purpose of this study was to determine whether signatures of adaptive postural control remain present in children with cerebral palsy (CP) when they performed a supra-postural task (i.e., a task performed above and beyond the control of posture) requiring them to balance a marble inside a tube held in the hands. Measures of center of pressure (COP) dynamics (how regular or predictable were the COP data as quantified by the sample entropy metric) and variability (as quantified by the COP standard deviation) were obtained from a sample of children with CP (n=30) and compared to the same measures taken from typically developing (TD) children. Children with CP demonstrated an apparent inefficiency in postural control (greater irregularity, greater sway variability) relative to TD peers during a quiet-stance (no supra-postural task) condition ($p<.05$). During supra-postural task performance, those differences were attenuated, though they remained statistically different ($p<.05$). The findings illustrate flexibility and adaptability in the postural control system, despite the pathological features associated with CP.

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PMID: 25913503 [PubMed - as supplied by publisher]

5. J Phys Ther Sci. 2015 Mar;27(3):763-8. doi: 10.1589/jpts.27.763. Epub 2015 Mar 31.

Effect of a single session of transcranial direct-current stimulation combined with virtual reality training on the balance of children with cerebral palsy: a randomized, controlled, double-blind trial.

Lazzari RD1, Politti F1, Santos CA1, Dumont AJ1, Rezende FL1, Grecco LA1, Braun Ferreira LA1, Oliveira CS1.

Purpose: The aim of the present study was to investigate the effects of a single session of transcranial direct current stimulation combined with virtual reality training on the balance of children with cerebral palsy. Subjects and Methods: Children with cerebral palsy between four and 12 years of age were randomly allocated to two groups: an experimental group which performed a single session of mobility training with virtual reality combined with active transcranial direct current stimulation; and a control group which performed a single session of mobility training with virtual reality combined with placebo transcranial direct current stimulation. The children were evaluated before and after the training protocols. Static balance (sway area, displacement, velocity and frequency of oscillations of the center of pressure on the anteroposterior and mediolateral axes) was evaluated using a force plate under four conditions (30-second measurements for each condition): feet on the force plate with the eyes open, and with the eyes closed; feet on a foam mat with the eyes open, and with the eyes closed. Results: An increase in sway velocity was the only significant difference found. Conclusion: A single session of anodal transcranial direct current stimulation combined with mobility training elicited to lead to an increase in the body sway velocity of children with cerebral palsy.

PMID: 25931726 [PubMed]

6. J Child Orthop. 2015 Apr 29. [Epub ahead of print]

The prognostic value of the head-shaft angle on hip displacement in children with cerebral palsy.

van der List JP1, Witbreuk MM, Buizer AI, van der Sluijs JA.

BACKGROUND: Hip displacement is the second most common deformity in cerebral palsy (CP). The risk for hip displacement is related to the Gross Motor Function Classification System (GMFCS). Recently, the head-shaft angle (HSA) has been identified as a predictor for hip displacement and the aim of this study is to assess the predictive value of the HSA for hip displacement in CP. METHODS: In this retrospective cohort, we performed radiological measurements in 50 children on both hips. In children with GMFCS level II (30 hips), III (30 hips), IV (20 hips) and V (20 hips), we measured the HSA and migration percentage (MP) in three age intervals: age two years (T1), age four years (T2) and age seven years (T3). RESULTS: At T1, the HSA was larger (more valgus) in hips that will displace than in hips that will not displace (174° vs. 166°; p = 0.001) and was also larger in higher GMFCS levels (IV-V vs. II-III) (172° vs. 165°; p < 0.001). At T1, GMFCS [odds ratio (OR) 14.7; p = 0.001] and HSA (OR 1.102; p = 0.043) were predictors for hip displacement at T3, but at T2, MP (OR 1.071; p = 0.010) was the only predictor for hip displacement at T3. CONCLUSIONS: The HSA at two years is larger in hips that will displace and larger in children with higher GMFCS levels (IV-V). At age two years, GMFCS and HSA are valuable predictors for hip displacement, but at the age of four years, only MP should be used in the prediction of hip displacement.

LEVEL OF EVIDENCE: Prognostic study, level II.

PMID: 25920927 [PubMed - as supplied by publisher]

7. Augment Altern Commun. 2015 Apr 29:1-16. [Epub ahead of print]

Participation and Enjoyment in Play with a Robot between Children with Cerebral Palsy who use AAC and their Peers.

Ferm UM1, Claesson BK, Ottesjö C, Ericsson S.

This study explores children with complex communication needs, their peers and adult support persons in play with the talking and moving robot LekBot. Two triads were filmed playing with LekBot at pre-school. LekBot was developed to facilitate independent and enjoyable play on equal terms for children with significant communication disabilities and their peers. Using Conversation Analysis, participatory symmetry and enjoyment were investigated in relation to spoken and gestural communication, embodied stance, gaze, and affective display. Data originated from three video-recorded sessions that were approximately 2 hours long. Four different interaction situations were identified and explored: Participatory Asymmetry, Adult Facilitation, Greater Participatory Symmetry and Creativity, and Turn-taking and Enjoyable Play with LekBot. Neither participatory symmetry nor enjoyment were easily achieved in the play sessions and may require considerable effort, including adult involvement, but creative, spontaneous and highly enjoyable play, correlating with participatory symmetry to various degrees, was observed in a few instances. The findings are discussed with regard to play, AAC and the future development of robots to facilitate play.

PMID: 25921358 [PubMed - as supplied by publisher]

8. Proc Natl Acad Sci U S A. 2014 Dec 9;111(49):17630-5. doi: 10.1073/pnas.1419977111. Epub 2014 Nov 24.

Brain-machine interface for eye movements.

Graf AB1, Andersen RA1.

A number of studies in tetraplegic humans and healthy nonhuman primates (NHPs) have shown that neuronal activity from reach-related cortical areas can be used to predict reach intentions using brain-machine interfaces (BMIs) and therefore assist tetraplegic patients by controlling external devices (e.g., robotic limbs and computer cursors). However, to our knowledge, there have been no studies that have applied BMIs to eye movement areas to decode intended eye movements. In this study, we recorded the activity from populations of neurons from the lateral intraparietal area (LIP), a cortical node in the NHP saccade system. Eye movement plans were predicted in real time using Bayesian inference from small ensembles of LIP neurons without the animal making an eye movement. Learning, defined as an increase in the prediction accuracy, occurred at the level of neuronal ensembles, particularly for difficult predictions. Population learning had two components: an update of the parameters of the BMI based on its history and a change in the responses of individual neurons. These results provide strong evidence that the responses of neuronal ensembles can be shaped with respect to a cost function, here the prediction accuracy of the BMI. Furthermore, eye movement plans could be decoded without the animals emitting any actual eye movements and could be used to control the position of a cursor on a computer screen. These findings show that BMIs for eye movements are promising aids for assisting paralyzed patients.

PMID: 25422454 [PubMed - indexed for MEDLINE] PMCID: PMC4267382 [Available on 2015-06-09]

9. Int J Pediatr Otorhinolaryngol. 2015 Apr 7. pii: S0165-5876(15)00152-4. doi: 10.1016/j.ijporl.2015.03.027. [Epub ahead of print]

Acute colonic pseudo-obstruction in a child taking trihexyphenidyl for drooling: Prescribers beware.

Begbie F1, Walker G2, Kubba H3, Sabharwal A2.

Colonic pseudo-obstruction (Ogilvie's Syndrome) in children is relatively uncommon. We report an unusual case of colonic pseudo-obstruction in an 8-year-old child with cerebral palsy and long-term hypomotility issues being treated for drooling with the anticholinergic medication trihexyphenidyl. He presented as an emergency with severe abdominal distension, abdominal tenderness and vomiting. An emergency laparotomy revealed colonic dilatation and a defunctioning ileostomy was created. To our knowledge, this is the first case reporting colonic pseudo-obstruction as a possible complication of treatment with trihexyphenidyl. We suggest prescribers should exercise

caution when prescribing trihexyphenidyl in patients with long-term intestinal hypomotility issues.

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PMID: 25912627 [PubMed - as supplied by publisher]

10. Dev Med Child Neurol. 2015 Apr 27. doi: 10.1111/dmcn.12784. [Epub ahead of print]

Ambulatory children with cerebral palsy do not exhibit unhealthy weight gain following selective dorsal rhizotomy.

Gutknecht SM1, Schwartz MH, Munger ME.

AIM: The aim of this study was to retrospectively analyze changes in age- and sex-adjusted body mass index (BMI) in ambulatory children with cerebral palsy (CP) who underwent selective dorsal rhizotomy (SDR). METHOD: Raw BMI, age- and sex-adjusted BMI z-scores, weight classification status, energy expenditure, and ambulation function were calculated before and after SDR at multiple post-SDR time points: 6 to <24 months, 24 to <48 months, 48 to <72, and 72 to <96 months. Linear mixed models were used to analyze changes in raw BMI, BMI z-scores, energy expenditure, and ambulation function. RESULTS: Pre- and post-surgical data were available for 363 children diagnosed with CP who underwent SDR (219 males, 144 females; mean age 6y [SD 2y 1mo]; mean BMI z-score 0.09 [SD 1.21]). Data from additional post-surgical time points were collected on subsamples. Although raw BMI significantly increased ($p<0.01$), these increases were consistent with anticipated growth. BMI z-scores did not significantly change over the 10-year study period. INTERPRETATION: Concerns of unhealthy weight gain following SDR are not supported by this study. Further work examining possible risk factors for BMI increase following SDR, as well as examining disparities in existing criteria for patient selection, is merited.

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PMID: 25914153 [PubMed - as supplied by publisher]

11. J Pediatr Orthop. 2015 Apr 17. [Epub ahead of print]

The Effect of Body Mass Index on Postoperative Morbidity After Orthopaedic Surgery in Children With Cerebral Palsy.

Minhas SV1, Chow I, Otsuka NY.

BACKGROUND: Although a plethora of literature exists on the impact of body mass index (BMI) in orthopaedic surgery, few have examined its implications in the pediatric cerebral palsy (CP) population. The aim of this study is to evaluate the effect of BMI class on 30-day complications after orthopaedic surgery on children with CP. METHODS: A retrospective analysis of the American College of Surgeons National Surgical Quality Improvement Program (NSQIP) Pediatric participant use files from 2012 to 2013 was conducted. Patients with a diagnosis of CP undergoing any orthopaedic procedure were included and subclassified according to BMI classes: underweight, normal weight, overweight, and obese. Multivariate logistic regressions were performed to evaluate the independent effect of BMI class on total, surgical site, and medical complications as well as unplanned reoperations. RESULTS: A total of 1746 patients were included in our study. These included 345 (19.8%) underweight, 952 (54.5%) normal weight, 209 (12.8%) overweight, and 240 (13.7%) obese children and adolescents. In hip and lower extremity osteotomies, underweight class was an independent risk factor for total complications (P=0.037) and medical complications (P=0.031). Similarly, underweight class was a risk factor for total complications (P=0.022) and medical complications (P=0.019) in spine procedures. Weight class was not independently associated with complications in tendon procedures. Overweight and obesity classes were not associated with any independent increased risk for complications. CONCLUSIONS: With respect to the pediatric CP population, underweight status was deemed an independent predictor of increased complications in osteotomies and spine surgery with no independent increased risk in the overweight or obese cohorts. This information can greatly aid providers with risk stratification, preoperative counseling, and postoperative monitoring as it relates to orthopaedic surgery.

LEVEL OF EVIDENCE: Prognostic level III.

PMID: 25929775 [PubMed - as supplied by publisher]

12. Nutr Hosp. 2015 May 1;31(n05):2062-2069.

Energy expenditure in children with cerebral palsy and moderate / severe malnutrition during nutritional recovery.

García-Contreras AA1, Vásquez-Garibay EM2, Romero-Velarde E3, Ibarra-Gutierrez AI4, Troyo-Sanroman R5.

OBJECTIVE: To analyze the total energy expenditure (TEE) and resting energy expenditure (REE) in children with cerebral palsy (CP) and moderate or severe malnutrition during nutritional recovery. METHODS: In an intervention study, thirteen subjects with CP (10 females and 3 males with a mean age of 9y11m ± 2y3m), level V of the Gross Motor Function Classification System and moderate or severe malnutrition were included. Eight were fed by nasogastric tube and five by gastrostomy. They were compared with 57 healthy participants (31 females and 26 males with mean age of 8y7m ± 10 m). Anthropometric measurements, body composition and energy expenditure by bioelectrical impedance analysis (BIA) and indirect calorimetry (IC) were performed in both groups. RESULTS: TEE and REE were higher in healthy children than in children with CP in kcal/d and kcal/cm/d but were lower in kcal/kg/d.

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PMID: 25929375 [PubMed - as supplied by publisher]

13. Respir Care. 2015 Apr 28. pii: respcare.04024. [Epub ahead of print]

Clinical and Pulmonary Function Markers of Respiratory Exacerbation Risk in Subjects With Quadriplegic Cerebral Palsy.

Vianello A1, Carraro E2, Pipitone E3, Marchese-Ragona R4, Arcaro G5, Ferraro M5, Paladini L5, Martinuzzi A2.

BACKGROUND: Although respiratory exacerbations are common in patients with quadriplegic cerebral palsy (CP), little is known about the factors that are related to increased exacerbation risk. This study aimed to identify the clinical and pulmonary function variables signaling risk of exacerbation in this type of patient. METHODS: Thirty-one children and young adults with quadriplegic CP underwent a comprehensive history, physical examination, and pulmonary function test, including arterial blood gas analysis, airway resistance using the interrupter technique, and home overnight SpO2 monitoring. Subjects were divided into 2 groups depending on the number of respiratory exacerbations reported during the year before study entry: frequent exacerbators (ie, ≥ 2 exacerbations) and infrequent exacerbators (ie, < 2 exacerbations). RESULTS: The frequent exacerbators were more likely to require hospitalization due to respiratory disorders compared with the infrequent exacerbators (13/14 vs 9/17, P = .02). Respiratory exacerbation was found to be associated with diagnosis of gastroesophageal reflux (adjusted odds ratio of 23.95 for subjects with confirmed diagnosis, P = .02) and higher PaCO2 levels (adjusted odds ratio of 12.60 for every 5-mm Hg increase in PaCO2, P = .05). Subjects with PaCO2≥ 35 mm Hg showed an exacerbation odds ratio of 15.2 (95% CI 1.5-152.5, P = .01). CONCLUSIONS: Gastroesophageal reflux and increased PaCO2 can be considered simple, clinically useful markers of increased exacerbation risk in young subjects with quadriplegic CP.

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PMID: 25922546 [PubMed - as supplied by publisher]

14. Neuropediatrics. 2015 Apr 28. [Epub ahead of print]

Sleep in Children with Neurodevelopmental Disabilities.

Angriman M1, Caravale B2, Novelli L2, Ferri R3, Bruni O2.

This review describes recent research in pediatric sleep disorders associated with neurodevelopmental disabilities (NDDs) and their treatment. NDDs affect more than 2% of the general population and represent more than 35% of the total cases of children referred to a neuropsychiatric center for sleep problems. Specific clinical and therapeutic aspects of sleep disorders associated with Down syndrome, Fragile X syndrome, Prader-Willi syndrome, Angelman syndrome, Rett syndrome, Smith-Magenis syndrome, cerebral palsy, and autism spectrum disorders are described. Furthermore, the drugs commonly used for sleep disorders in children with NDDs are described. The review clearly highlighted that children with NDDs are often affected by sleep disorders that require appropriate clinical and therapeutic approach to improve quality of life in both patients and families.

Georg Thieme Verlag KG Stuttgart · New York.

PMID: 25918987 [PubMed - as supplied by publisher]

15. J Phys Ther Sci. 2015 Mar;27(3):883-5. doi: 10.1589/jpts.27.883. Epub 2015 Mar 31.

Temperament of premature infants with cerebral palsy.

Ryu HJ1, Don Kim K1.

Purpose: The purpose of this study was to examine the infant temperaments of children with cerebral palsy due to premature birth. Subjects and Methods: Data were collected through questionnaires sent to 118 mothers of infants diagnosed with cerebral palsy due to premature birth. Results: Different infant temperament scores were obtained according to the degrees of disability, type of palsy, birth weights, gestational age, and periods of hospitalization in an NICU; however, the differences were not statistically significant. Conclusion: Additional comprehensive studies are necessary in order to understand the infant temperaments of newborns with cerebral palsy due to premature birth, as a prerequisite to providing efficient intervention programs supporting the children's development and growth, and to verify statistical significance.

PMID: 25931751 [PubMed]

Prevention and Cure

16. Dev Med Child Neurol. 2015 Apr 27. doi: 10.1111/dmcn.12787. [Epub ahead of print]

How low can we go? Recognizing infants at high risk of cerebral palsy earlier.

Mcintyre S1.

PMID: 25911972 [PubMed - as supplied by publisher]

17. Eur J Obstet Gynecol Reprod Biol. 2015 Apr 15;190:1-6. doi: 10.1016/j.ejogrb.2015.04.002. [Epub ahead of print]

Expert review - identification of intra-partum fetal compromise.

Prior T1, Kumar S2.

Whilst most cases of cerebral palsy occur as a consequence of an ante-natal insult, a significant proportion,

particularly in the term fetus, are attributable to intra-partum hypoxia. Intra-partum monitoring using continuous fetal heart rate assessment has led to an increased incidence of operative delivery without a concurrent reduction in the incidence of cerebral palsy. Despite this, birth asphyxia remains the strongest and most consistent risk factor for cerebral palsy in term infants. This review evaluates current intra-partum monitoring techniques as well as alternative approaches aimed at better identification of the fetus at risk of compromise in labour.

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PMID: 25917435 [PubMed - as supplied by publisher]

18. Gynecol Obstet Fertil. 2015 Apr 22. pii: S1297-9589(15)00096-X. doi: 10.1016/j.gyobfe.2015.03.022. [Epub ahead of print]

[P. Rozenberg in reply to the correspondence between D. Philopoulos and C. Racinet concerning the article by C. Racinet et al.: Can caesarean delivery prevent cerebral palsy?

Medico-legal implications of a French ecological study. Gynecol Obstet Fertil 2015:43:8-12].
[Article in French]

Rozenberg P1.

PMID: 25913438 [PubMed - as supplied by publisher]

19. J Child Neurol. 2015 Apr 28. pii: 0883073815582267. [Epub ahead of print]

Prognostic Predictors for Ambulation in Thai Children With Cerebral Palsy Aged 2 to 18 Years.

Keeratisiroj O1, Thawinchai N2, Siritaratiwat W3, Buntragulpoontawee M4.

The objectives of this study were to determine prognostic predictors for ambulation among Thai children with cerebral palsy and identify their ambulatory status. A retrospective cohort study was performed at 6 special schools or hospitals for children with physical disabilities. The prognostic predictors for ambulation were analyzed by multivariable ordinal continuation ratio logistic regression. The 533 participants aged 2 to 18 years were divided into 3 groups: 186 with independent ambulation (Gross Motor Function Classification System [GMFCS I-II]), 71 with assisted ambulation (Gross Motor Function Classification System III), and 276 with nonambulation (Gross Motor Function Classification System IV-V). The significant positive predictors for ambulation were type of cerebral palsy (spastic diplegia, spastic hemiplegia, dyskinesia, ataxia, hypotonia, and mixed type), sitting independently at age 2 years, and eating independently. These predictors were used to develop clinical scoring for predicting the future ability to walk among Thai children with cerebral palsy.

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PMID: 25922262 [PubMed - as supplied by publisher]

20. J Pediatr. 2015 Apr 28. pii: S0022-3476(15)00353-4. doi: 10.1016/j.jpeds.2015.03.052. [Epub ahead of print]

Prevention of Cerebral Palsy: Which Infants Will Benefit from Therapeutic Hypothermia?

Berg MT1.

PMID: 25929978 [PubMed - as supplied by publisher]

21. Obstet Gynecol. 2015 May;125 Suppl 1:89S-90S.

Home Visits Program Compared With Traditional Clinic Care for Pregnant Adolescents: Cost-Effectiveness Analysis.

Whalen PS1, Wilson-Smith MR, Pereira L, Caughey AB.

INTRODUCTION: Pregnant adolescents are at increased risk compared with older women for poor birth outcomes. Our study looks at the cost and effectiveness of home visit programs compared with traditional clinic prenatal and postpartum care on pregnancy outcomes. METHODS: A decision-analytic model was built comparing the outcomes of home visit programs and traditional clinic prenatal and postpartum care for a theoretical population of 100,000 pregnant adolescents. All probabilities and costs were derived from the literature. Neonatal outcomes included preterm delivery, cerebral palsy, and neonatal death. A threshold for cost-effectiveness was set at $100,000 per quality-adjusted life-year. Sensitivity analyses were performed to test the robustness of our baseline assumptions. RESULTS: Adolescents who participated in the home visits program would have lower instances of preterm births, cerebral palsy, and neonatal death leading to an additional 896 higher quality-adjusted life-year compared with traditional clinic visits. However, at a cost of $4,500 per adolescent, the home visit program was not cost-effective with a cost-effectiveness ratio of $303,500 per quality-adjusted life-year. A sensitivity analysis varying the cost of the home visit program found the program to be cost-effective when the cost approached $2,650 or less per adolescent and would be cost-saving at a cost per participant of $1,750. CONCLUSION: The home visit program improves outcomes in pregnant adolescents. However, the program is only cost-effective at a cost of $2,650 or less per adolescent. Further work is needed to modify such programs and reduce costs to ensure such programs are financially viable.

PMID: 25930621 [PubMed - as supplied by publisher]

22. Obstet Gynecol. 2015 May;125 Suppl 1:103S.

Induction of Labor for Suspected Macrosomia: A Cost-Effectiveness Analysis.

Lee VR1, Niu B, Kaimal A, Caughey AB.

INTRODUCTION: Current guidelines recommend expectantly managing pregnancies with suspected macrosomia, but earlier delivery may prevent adverse outcomes associated with macrosomic neonates. This study investigates whether induction of labor for macrosomia is cost-effective compared with expectant management. METHODS: A decision-analytic model was created comparing induction of labor at 39 weeks of gestation with expectant management until 40 or 41 weeks of gestation in a theoretic cohort of 100,000 pregnancies with suspected macrosomia (4,000 g) by ultrasonography. Strategies involving expectant management accounted for the probabilities of intrauterine fetal demise, spontaneous delivery, and induction of labor for nonreassuring nonstress test at each successive week of gestation; fetuses were also assumed to grow 220 g per week. Outcomes included mode of delivery, maternal death, intrauterine fetal demise, neonatal death, cerebral palsy (CP), and brachial plexus injury after shoulder dystocia. All inputs were derived from the literature. A cost-effectiveness threshold was set at $100,000 per quality-adjusted life-year. RESULTS: Induction of labor at 39 weeks of gestation would cost an additional $70 million but prevent 7,203 cesarean deliveries, 55 cases of intrauterine fetal demise, five cases of CP, two maternal deaths, and three brachial plexus injuries compared with delivery at 41 weeks of gestation. Differences in neonatal deaths were negligible. Compared with expectant management, induction of labor at 39 or 40 weeks of gestation is cost-effective at $17,662 and $30,272 per quality-adjusted life-year, respectively. Induction of labor at 39 weeks of gestation is also more cost-effective than delivery at 40 weeks of gestation. Induction of labor at 39 or 40 weeks of gestation is cost-effective until the accuracy of ultrasonography to detect macrosomia at 39 weeks of gestation fell below 5%. CONCLUSION: Induction of labor at 39 or 40 weeks of gestation for suspected macrosomia is cost-effective and improves perinatal outcomes.

PMID: 25930260 [PubMed - as supplied by publisher]

23. Pharmacology. 2015 Apr 25;95(5-6):209-217. [Epub ahead of print]

Passive Immunization against Congenital Cytomegalovirus Infection: Current State of Knowledge.

Jückstock J1, Rothenburger M, Friese K, Traunmüller F.

Primary infection with the human cytomegalovirus (CMV) occurs in 1-4% of pregnancies. The rates of maternal-fetal CMV transmissions are around 25, 36, 41, and 66%, for infections occurring in the peri-conceptional weeks, first, second, and third trimester of pregnancy, respectively. On the other hand, the severity of fetal organ damage and dysfunction diminishes with increasing gestational age. Congenitally CMV-infected newborns may have neurosensory impairments like mental retardation, cerebral palsy, epilepsy, progressive hearing loss or visual defects, or even may have a fatal outcome. In in-vitro experiments, CMV specific neutralizing IgG antibodies - which are abundant in CMV specific hyperimmune globulin (HIG) products - inhibited the entry of the virus into target cells and hampered viral cell-to-cell spread. This article provides a brief overview on the epidemiology and diagnostic tools in congenital CMV infection. It also concisely summarizes the currently available study results on the safety and effectiveness of HIG treatment. Accordingly, in clinical studies HIG administration to expectant mothers following primary CMV infection (prophylactic use) was shown to lower the risk of maternal-fetal transmission of CMV compared to untreated controls. HIG was also able to ameliorate the disease sequelae in evidently infected fetuses (therapeutic use), as demonstrated by the regression or even resolution of sonographic pathologies including placental inflammation. © 2015 S. Karger AG, Basel.

PMID: 25924667 [PubMed - as supplied by publisher]

24. PLoS One. 2015 Apr 29;10(4):e0124120. doi: 10.1371/journal.pone.0124120. eCollection 2015.

Trends in the prevalence of autism spectrum disorder, cerebral palsy, hearing loss, intellectual disability, and vision impairment, metropolitan atlanta, 1991-2010.

Van Naarden Braun K1, Christensen D1, Doernberg N1, Schieve L1, Rice C1, Wiggins L1, Schendel D1, Yeargin-Allsopp M1.

This study examined the prevalence and characteristics of autism spectrum disorder (ASD), cerebral palsy (CP), hearing loss (HL), intellectual disability (ID), and vision impairment (VI) over a 15-20 year time period, with specific focus on concurrent changes in ASD and ID prevalence. We used data from a population-based developmental disabilities surveillance program for 8-year-olds in metropolitan Atlanta. From 1991-2010, prevalence estimates of ID and HL were stable with slight increases in VI prevalence. CP prevalence was constant from 1993-2010. The average annual increase in ASD prevalence was 9.3% per year from 1996-2010, with a 269% increase from 4.2 per 1,000 in 1996 to 15.5 per 1,000 in 2010. From 2000-2010, the prevalence of ID without ASD was stable; during the same time, the prevalence of ASD with and without co-occurring ID increased by an average of 6.6% and 9.6% per year, respectively. ASD prevalence increases were found among both males and females, and among nearly all racial/ethnic subgroups and levels of intellectual ability. Average annual prevalence estimates from 1991-2010 underscore the significant community resources needed to provide early intervention and ongoing supports for children with ID (13.0 per 1,000), CP, (3.5 per 1,000), HL (1.4 per 1,000) and VI (1.3 in 1,000), with a growing urgency for children with ASD.

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