Cerebral Palsy ALLIANCE

NEWS
Cerebral Palsy Research

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Interventions and Management

1. Neurorehabil Neural Repair. 2013 Jul 25. [Epub ahead of print]

Randomized Trial of Observation and Execution of Upper Extremity Actions Versus Action Alone in Children With Unilateral Cerebral Palsy.

Sgandurra G, Ferrari A, Cossu G, Guzzetta A, Fogassi L, Cioni G.

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BACKGROUND: The properties of the mirror neuron system suggest a new type of upper limb (UL) rehabilitation in children with unilateral cerebral palsy (UCP), based on observation of action therapy followed by execution of a variety of observed movements (AOT). OBJECTIVE: We tested the effects of AOT in the Upper Limb Children Action Observation Training (UP-CAT) trial. METHODS: In a randomized, evaluator-blinded, block-designed trial, 24 UCP children with mild to moderate hand impairment were assigned to 2 groups. The experimental group observed, 1 hour per day for 3 consecutive weeks, video sequences of unimanual or bimanual goal-directed actions and subsequently executed observed actions with the hemiparetic UL or both ULs. The control group performed the same actions in the same order as the experimental sample, but had watched computer games. The Assisting Hand Assessment (AHA) scale was the primary outcome measure; the Melbourne assessment and ABILHAND-Kids were secondary ones. Outcomes were assessed at 1 week (T1), 8 weeks (T2), and 24 weeks (T3) after the end of the training. RESULTS: The experimental group improved more (P = .008) in score changes for the AHA at the primary endpoints T1 (P = .008), T2 (P = .019), and T3 (P = .049). No between-group significant changes were found for ABILHAND-Kids or Melbourne assessment. CONCLUSIONS: UP-CAT improved daily UL activities in UCP children, suggesting a new rehabilitation approach based on a neurophysiological model of motor learning.

PMID: 23886886 [PubMed - as supplied by publisher]

2. Ann Rehabil Med. 2013 Jun;37(3):328-35. doi: 10.5535/arm.2013.37.3.328. Epub 2013 Jun 30.

Botulinum Toxin Treatment on Upper Limb Function in School Age Children With Bilateral Spastic Cerebral Palsy: One Year Follow-up.

Lee JS, Lee KB, Lee YR, Choi YN, Park CW, Park SD, Jung DH, Lee CS.

Department of Rehabilitation Medicine, Seoul Rehabilitation Hospital, Seoul, Korea.

OBJECTIVE: To prospectively investigate the long-term effects of botulinum toxin treatment on the upper limb function and performance of school age children with spastic bilateral cerebral palsy, who have limitations in performing activities of daily living and school activities, due to spasticity of the upper extremities. METHODS: Botulinum type A toxin (BoNT-A) was injected into 24 spastic upper limbs of 15 children. We used a Modified Ashworth Scale and a Modified Tardieu Scale for the evaluation of upper limb spasticity, and Quality of Upper Extremity Skills Test (QUEST), Canadian Occupational Performance Measure (COPM), and Test of Visual-Motor Skills-Revised (TVMS-R) for the evaluation of upper limb function and performance. RESULTS: Upper limb spasticity continuously decreased until the end of the one-year follow-up. Upper limb function on QUEST and COPM showed the best performance at 3 months and deteriorated slightly, but still showed a significantly better performance at 9 and 12 months than at pre-injection. In more functional nine subjects who could perform TVMS-R, the performance enhancement effects remained constant after 12 months, suggesting that the reduced spasticity led to the learning effect acquired by the repeated use of the affected upper limb. CONCLUSION: For school age children with bilateral spastic cerebral palsy whose upper limb functions are important, BoNT-A injections seem to be of help in the performance of school activities and activities of daily living.

PMID: 23869330 [PubMed] PMCID: PMC3713289

3. Dev Neurorehabil. 2013 Jul 19. [Epub ahead of print]

Quantification of long-term effects of botulinum injection in a case of cerebral palsy affecting the upper limb movement.

Molteni E, Rigoldi C, Morante M, Rozbaczylo C, Haro M, Albertini G, Galli M, Bianchi AM.

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Objective: The aim of this work was to put into evidence the long-lasting modification induced by botulinum toxin injection and rehabilitative treatment on motor control. Methods: In this contribution, we report the case of a female child showing hemiplegia, due to cerebral palsy. She underwent botulinum injection, followed by physical and occupational therapy. We quantified the biomechanical, cerebral and occupational aspects of her impaired upper limb, also dynamically, with respect to her pre- and post-treatment condition. Results: Small long-lasting improvements - induced on biomechanics by botulinum injection - triggered wide cerebral modification, well reflected in improved contextual movements and motor strategy. Conclusion: These results provide evidences that small modifications in the end-effector performance often imply cerebral modifications and improvement in finalized motor strategy.

PMID: 23869622 [PubMed - as supplied by publisher] Free PMC Article

4. Eur J Paediatr Neurol. 2013 Jul 18. pii: S1090-3798(13)00103-7. doi: 10.1016/j.ejpn.2013.06.003. [Epub ahead of print]

Long-term follow-up on continuous intrathecal Baclofen therapy in non-ambulant children with intractable spastic Cerebral Palsy.

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BACKGROUND: Little is known about the long-term effects of Continuous intrathecal Baclofen (CITB) therapy in non-ambulant children with intractable spastic Cerebral Palsy (CP). AIM: To determine whether short-term beneficial effects of CITB therapy are present at the long-term, and whether caregivers would choose CITB therapy for their child again considering the advantages and disadvantages encountered over the years. METHODS: Long-term follow-up data were obtained of the children whom had previously participated in a RCT on CITB by the Dutch Study Group on Spasticity. Quality of life (QoL) was assessed by the Child Health Questionnaire (CHQ), current satisfaction with CITB was measured by use of a Visual Analogue Scale regarding previously set treatment goals, functioning in daily living was determined by a questionnaire concerning functioning of the child, and possible detrimental effects of CITB therapy encountered over the years were noted. All data were acquired via interview of

the caregivers. RESULTS: All 17 children of the former trial participated in this study. Previously identified significant positive effects on pain (CHQ 46.8 vs. 74.38, p = 0.002; VAS 2.4 vs. 8.01, p = 0.02), ease of care (VAS 2.0 vs. 7.26, p = 0.00), and mental health (CHQ 67.2 vs. 75.94, p = 0.010) were still present at the end of the trial. Novel significant positive effects were noted at six to nine years follow-up, i.e. significantly improved scores on the Parent Impact - Emotional subscale (CHQ 66.0 vs. 78.2, p = 0.008), Parent Impact - Time subscale (CHQ 68.9 vs. 91.72, p = 0.002), and the Physical Summary (CHQ 17.6 vs. 27.4, p = 0.019) compared to baseline. Ninety-four percent of the caregivers would choose CITB treatment again for their child again. CONCLUSION:
The beneficial effects of CITB are present at the long term and caregiver satisfaction is high.

PMID: 23871360 [PubMed - as supplied by publisher]

5. J Electromyogr Kinesiol. 2013 Jul 22. pii: S1050-6411(13)00126-0. doi: 10.1016/j.jelekin.2013.06.002. [Epub ahead of print]

Walking speed effects on the lower limb electromyographic variability of healthy children aged 7-16years.

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The evaluation of surface electromyography (sEMG) is commonly performed in children with cerebral palsy (CP) and reliable interpretation necessitates knowledge of the variability in age-matched, typically developing (TD) children. Variance ratio was calculated for inter-trial sEMG linear envelope (LE) and the Instantaneous Mean Frequency (IMNF) variability in the lower limb muscle in TD children, in three different age groups during slow, comfortable speed, and fast walking. Significantly greater variability was found in the 7-9 group compared to the 13-16years. Variability during both slow and fast walking was significantly greater compared to comfortable speed walking and was profound in the 7-9year age group. Variability of the IMNF was significantly greater than LE in the Tibialis-Anterior, Biceps-Femoris (BF), Vastus-Lateralis (VL), and Rectus-Femoris (RF). Clinical implications are that children under 10years are more variable than older children when walking either slower or faster than self-selected walking speed. This suggests that muscle activation patterns in gait mature at a later stage of childhood than do kinematic gait patterns. Greater precaution, therefore, is needed when comparing sEMG patterns of less than 10years of age patient and TD children.

PMID: 23886484 [PubMed - as supplied by publisher]

6. J Neuroeng Rehabil. 2013 Jul 23;10(1):81. [Epub ahead of print]

Differentiation between non-neural and neural contributors to ankle joint stiffness in cerebral palsy.

de Gooijer-van de Groep KL, de Vlugt E, de Groot JH, van der Heijden-Maessen HC, Wielheesen DH, van Wijlen-Hempel RM, Arendzen JH, Meskers CG.

BACKGROUND: Spastic paresis in cerebral palsy (CP) is characterized by increased joint stiffness that may be of neural origin, i.e. improper muscle activation caused by e.g. hyperreflexia or non-neural origin, i.e. altered tissue viscoelastic properties (clinically: "spasticity" vs. "contracture"). Differentiation between these components is hard to achieve by common manual tests. We applied an assessment instrument to obtain quantitative measures of neural and non-neural contributions to ankle joint stiffness in CP. METHODS: Twenty-three adolescents with CP and eleven healthy subjects were seated with their foot fixated to an electrically powered single axis footplate. Passive ramp-and-hold rotations were applied over full ankle range of motion (RoM) at low and high velocities. Subject specific tissue stiffness, viscosity and reflexive torque were estimated from ankle angle, torque and triceps surae EMG activity using a neuromuscular model. RESULTS: In CP, triceps surae reflexive torque was on average 5.7 times larger (p = .002) and tissue stiffness 2.1 times larger (p = .018) compared to controls. High tissue stiffness

was associated with reduced RoM ($p < .001$). Ratio between neural and non-neural contributors varied substantially within adolescents with CP. Significant associations of SPAT (spasticity test) score with both tissue stiffness and reflexive torque show agreement with clinical phenotype. CONCLUSIONS: Using an instrumented and model based approach, increased joint stiffness in CP could be mainly attributed to higher reflexive torque compared to control subjects. Ratios between contributors varied substantially within adolescents with CP. Quantitative differentiation of neural and non-neural stiffness contributors in CP allows for assessment of individual patient characteristics and tailoring of therapy.

PMID: 23880287 [PubMed - as supplied by publisher] Free full text

7. Muscles Ligaments Tendons J. 2013 May 21;3(1):42-50. doi: 10.11138/mltj/2013.3.1.042. Print 2013 Jan.

Tendon structure and extracellular matrix components are affected by spasticity in cerebral palsy patients.

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We studied the effect of spasticity-induced overload on tendons from the gracilis and semitendinosus muscles from cerebral palsy (CP) and healthy subjects (CT) stained with haematoxylineosin, Sirius red and Alcian blue. Vascularity was also characterized using an anti-CD34 antibody. Light microscopy analysis of haematoxylin-eosin stained sections revealed that the overall structure of tendons was maintained, characterized by parallel and slightly wavy collagen fibers in both CT and CP tendons. However, hypercellularity, cell rounding, increased vascularity and lipoid degeneration were observed in CP samples. Sirius red stained collagen fibers were more evident in CP tendons, suggesting an increased collagen content induced by spasticity. Alcian blue staining revealed an overall increase of glycosaminoglycans in CP tendons as observed in tendinopathy. Our results suggest that CP-induced spasticity may be considered as a chronic, persisting and repetitive loading of tendons, inducing ECM remodeling as adaptive response to increased functional demand. At the same time, the evidence of some tendinopathic-like markers in CP tendons suggests that the chronic nature of the CP condition could represent a pathologic condition, possibly leading to a transient weakness of the tissue making it more susceptible to damage from cumulative loading until an overt tendinopathy develops.

PMID: 23885344 [PubMed] PMCID: PMC3676163 Free PMC Article

8. Anaesthesiol Intensive Ther. 2013 Apr-Jun;45(2):82-4. doi: 10.5603/AIT.2013.0018.

Management of myasthenic crisis in a child.

Rybojad B, Lesiuk W, Fijałkowska-Nestorowicz A, Rybojad P, Sawicki M, Lesiuk L.

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Myasthenia gravis is an autoimmune disorder of peripheral nervous system, leading to fluctuating muscle weakness. It is caused by circulating antibodies that block acetylcholine nicotinic postsynaptic receptors at the postsynaptic neuromuscular junction. Myasthenic crisis is a life-threatening complication, which is defined as weakness from acquired myasthenia gravis. In this paper we described a 15-year-old boy who was admitted to the Paediatric Intensive Care Unit due to myasthenic crisis. He had suffered not only from myasthenia gravis but also hypothyroidism, cerebral palsy and epilepsy. The patient required mechanical ventilation and was successfully treated with both plasmapheresis and intravenous immunoglobulins. He recovered from the crisis and then thymectomy was performed. Perioperative period and anaesthesia passed uncomplicated. Discharged home from the hospital after 2.5 month-treatment, for the last 4 years, he has only come on scheduled outpatient medical appointments. This case reveals that myasthenic crisis, albeit rare, may occur in male adolescents. In such cases multidisciplinary care followed by surgery becomes a procedure of choice. Concomitant medical problems, if well controlled, do not affect the results of outcome of the underlying disease.

PMID: 23877900 [PubMed - in process] Free Full Text

9. Arch Pediatr. 2013 Jul 19. pii: S0929-693X(13)00360-6. doi: 10.1016/j.arcped.2013.06.004. [Epub ahead of print]

Understand the neurodevelopment of language: A necessity to prevent learning disabilities in children [Article in French]

LAMOPRESCO. Collaborators (15)

Clinical and radiological knowledge of language development in the former premature infant compared to the newborn allows us to argue for exploration of the sensorimotor co-factors required for proper language development. There are early representations of the maternal language in the infant's visual, auditory, and sensorimotor areas, activated or stabilized by orofacial and articulatory movements. The functional architecture of language is different for vulnerable children such as premature infants. We have already mentioned the impact of early dysfunction of the facial praxis fine motor skills in this population presenting comprehension disorders. A recent meta-analysis confirms the increasing difficulty of understanding between 3 and 12 years, questioning the quality of the initial linguistic processes. A precise analysis of language, referenced from 3 years of age, should be completed by sensorimotor tests to assess possible constraints in automating neurolinguistic foundations. The usual assessment at this age can exclude sensory disturbances and communication and offers guidance and socialization. However, a recent study shows the ineffectiveness of "language-reinforced immersion" at 2 and 3 years in a population of vulnerable children. The LAMOPRESCO study of language and motor skills in the premature infant (National PHRC 2010) has assessed language and sensorimotor skills of preterm-born (<33weeks) 3.5-year-old children without cerebral palsy. Fragile children were randomized into 2 groups, 1 stimulated by a specific individual protocol, the other given guidance. The primary endpoint was phonology, assuming that it is composed of very early good-quality sensorimotor integration stabilized by the child's oral facial motor skills before 5 years of age. This developmental integrative dynamic validates the "motor theory of speech perception." Early and accurate assessment of language and the patient's constraints should differentiate and specify management strategies for all children, whatever their background and pathologies.

PMID: 23876442 [PubMed - as supplied by publisher]

10. BMC Public Health. 2013 Jul 23;13(1):675. [Epub ahead of print]

Study protocol: Longitudinal study of the transition of young people with complex health needs from child to adult health services.

Colver AF, Merrick H, Deverill M, Le Couteur A, Parr J, Pearce MS, Rapley T, Vale L, Watson R, McConachie H.

BACKGROUND: Young people with complex health needs have impairments that can limit their ability to carry out day-to-day activities. As well as coping with other developmental transitions, these young people must negotiate the transfer of their clinical care from child to adult services. The process of transition may not be smooth and both health and social outcomes may suffer. Increasingly, policy-makers have recognised the need to ensure a smoother transition between children's and adult services, with processes that are holistic, individualised, and person-centred; however, there is little outcome data to support proposed models of care. This study aims to identify the features of transitional care that are potentially effective and efficient for young people with complex health needs making their transition. Methods/design: Longitudinal cohort study. 450 young people aged 14 years to 18 years 11 months (with autism spectrum disorder and an additional mental health problem, cerebral palsy or diabetes) will be followed through their transition from child to adult services and will contribute data at baseline, 12, 24 and 36 months. We will collect data on: health and wellbeing outcomes (participation, quality of life, satisfaction with services, generic health status (EQ-5D-Y) and condition specific measure of disease control or management); exposure to proposed beneficial features of services (such as having a key worker, appropriate involvement of parents); socio-economic characteristics of the sample; use of condition-related health and personal social services; preferences for the characteristics of transitional care. We will us regression techniques to explore how outcomes vary by exposure to service features and by characteristics of the young people. These data will populate a decision-analytic model comparing the costs and benefits of potential alternative ways of organising transition services. In order to better understand mechanisms and aid interpretation, we will undertake qualitative work with 15 young people, including interviews, non-participant observation and diary collection. DISCUSSION: This study will evaluate the effect of service components of transitional care, rather than evaluation of specific models that may

be unsustainable or not generalisable. It has been developed in response to numerous national and international calls for such evaluation.

PMID: 23875722 [PubMed - as supplied by publisher] Free PMC Article

11. Klin Oczna. 2013;115(1):13-4.

Botulinum toxin injection as primary treatment for esotropia in patients with cerebral palsy.

Malgorzata M, Wojciech K, Alina BŁ, Artur B.

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PURPOSE: Botulinum toxin type A is a potent neurotoxin that blocks the release of acetylocholine at the neuromuscular junction of cholinergic nerves. Cerebral palsy is cause of ocular disorders. There is an increased presence of strabismus, refractive errors, and reduced visual acuity. The purpose of this study was to assess the efficacy of botulinum toxin injection in the treatment of esotropia in patients with cerebral palsy. MATERIAL AND METHODS: Seven patients were included in the study. All patients had a full ophthalmic examination on initial visit, including cycloplegic refraction and duction. The angle of esotropic deviation at distance was recorded in prism diopters. The botulinum toxin type A was administered into the medial rectus muscle under general anesthesia. RESULTS: Mean age of the patients was 12 years. The mean angle of deviation pretreatment was 36.6 PD. Successful motor alignment (orthotropia +/- 10 PD) was achieved in the botulinum toxin type A group in 57.1% of patients. CONCLUSIONS: The use of botulinum toxin in the treatment of esotropia in children and adolescents with cerebral palsy is an alternative to conventional surgical therapy.

PMID: 23882732 [PubMed - in process]

12. Disabil Rehabil. 2013 Jul 22. [Epub ahead of print]

Exploring the later life relationship between adults with cerebral palsy and their non-disabled siblings.

Dew A, Llewellyn G, Balandin S.

Community Based Health Care

Purpose: Adults with moderate or severe cerebral palsy often require significant lifetime support from family and formal services. The aim of this study was to use a life course approach to explore how previous life experiences impact on the later life relationships of people with moderate to severe cerebral palsy aged 40 years and over and their non-disabled siblings. Method: Twelve adults with moderate to severe cerebral palsy and 16 of their non-disabled siblings were interviewed twice to explore their relationships. Constructivist grounded theory method was used to analyse the data. Results: Four themes were identified as important in understanding these later life sibling relationships: sharing childhood experiences, contact in adulthood, diminishing parental role and increasing support needs. Conclusions: The life course approach indicated that siblings' growing up together was important for the development and maintenance of emotional closeness later in life. Emotional closeness and familial obligation were important factors in motivating siblings with and without cerebral palsy to maintain or re-establish contact with each other in adulthood. Maintenance of sibling relationships in later life is dependent on health, proximity and the ability to keep in contact with each other. Implications for Rehabilitation As adults with severe cerebral palsy live longer, their relationships with non-disabled siblings often take on increased importance and particularly as their parents may be no longer able to provide support. Service providers have a role in helping ageing siblings with and without disability to maintain and build their relationships, for example, by supporting geographically distant siblings to keep in touch. Service providers have a role in supporting the person with a disability and their siblings to make plans for the future.

PMID: 23875813 [PubMed - as supplied by publisher]

13. Dev Neurorehabil. 2013 Jul 19. [Epub ahead of print]

Are you doing what you want to do? Leisure preferences of adolescents with cerebral palsy.

Shikako-Thomas K, Shevell M, Lach L, Law M, Schmitz N, Poulin C, Majnemer A.

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Objective: This study aimed at describing leisure activity preferences of adolescents with cerebral palsy (CP) and their relationship to participation and to identify factors associated with greater interest in particular leisure activities. Methods: A cross-sectional design was used. Participants were adolescents (n = 127; 59.5% male; ages 12-19 years old; mean = 15.3; SD = 2.01 years) with CP (GMFCS levels: I 40%, II 33%, III-IV 26%), who could complete the Preferences for Activities of Children (PAC) and other self-report questionnaires. Results: Social (2.53; 0.38) and active-physical activities were most preferred (2.10; 0.42), and self-improvement activities were least preferred (1.93; 0.49). Preference for certain activities was not strongly associated with actual involvement in these activities. Family activity-orientation, family expressiveness, and adolescent's motivation explained 15% of the variance in preferences for social activities, and 37% of the variance in preferences for self-improvement activities. Conclusion: Family factors, personal factors, and functional abilities influence leisure preferences. Rehabilitation interventions should consider adolescents' preferences and family dynamics to promote leisure participation.

PMID: 23869565 [PubMed - as supplied by publisher]

14. Dev Med Child Neurol. 2013 Jul 22. doi: 10.1111/dmcn.12222. [Epub ahead of print]

Stand up and be counted.

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PMID: 23869978 [PubMed - as supplied by publisher]

15. Dev Neurorehabil. 2013 Jul 19. [Epub ahead of print]

Work process related to cerebral palsy of neurological rehabilitation centers.

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Objective: To evaluate the work process for CP cases in different rehabilitation centers according to Brazilian health policies and recommendations from the "World Report on Disability". Methods: A questionnaire - Evaluation Process of Rehabilitation of Children with CP was applied to the Coordinators of 13 services. This instrument has a maximum score of 108 points. Results: The results of the questionnaire varied from 28 to 64 points. The mean and SD were 43.5 and 10.9, respectively. The main administrative difficulties were: (a) presence of unmet demand, (b) patient absenteeism, (c) referral to primary care services, (d) inadequate physical facilities, (e) the scarce provision of prosthetics and orthotics, (f) insufficient financial resources, (g) human resources training, (h) difficulties with the use of the information system and (i) transportation difficulties for patients. Conclusion: Administrative and clinical guidelines are needed for uniformity of the work process of the rehabilitation centers.

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Prevention and Cure

16. Pediatrics. 2013 Jul 22. [Epub ahead of print]

General Movements in Very Preterm Children and Neurodevelopment at 2 and 4 Years.

Spittle AJ, Spencer-Smith MM, Cheong JL, Eeles AL, Lee KJ, Anderson PJ, Doyle LW.

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OBJECTIVE: Although ~50% of very preterm (VP) children have neurodevelopmental impairments, early prediction of infants who will experience problems later in life remains a challenge. This study evaluated the predictive value of general movements (GM; spontaneous and endogenous movements) at 1 and 3 months' corrected age for neurodevelopment at 2 and 4 years of age in VP children. METHODS: At 1 and 3 months' corrected age, infants born <30 weeks' gestation had GM assessed as normal or abnormal. Motor, cognitive, and language development at 2 years was assessed by using the Bayley Scales of Infant and Toddler Development, Third Edition. At 4 years, cognitive and language outcomes were assessed by using the Differential Ability Scale-Second Edition and motor outcomes with the Movement Assessment Battery for Children-Second Edition; a diagnosis of cerebral palsy was documented. RESULTS: Ninety-nine VP infants were recruited, with 97% and 88% of survivors followed up at age 2 and 4 years, respectively. Abnormal GM at 1 month were associated with worse motor outcomes at 2 and 4 years but not language or cognitive outcomes. Abnormal GM at 3 months were associated with worse motor, cognitive, and language outcomes at both 2 and 4 years. Overall, GM at 1 month demonstrated better sensitivity to impairments at 2 and 4 years, whereas GM at 3 months had better specificity and were more accurate overall at distinguishing between children with and without impairment. CONCLUSIONS: Abnormal GM in VP infants, particularly at 3 months postterm, are predictive of worse neurodevelopment at ages 2 and 4 years.

PMID: 23878041 [PubMed - as supplied by publisher]

17. Am J Perinatol. 2013 Jul 24. [Epub ahead of print]

Neurodevelopmental Outcomes of Very Low Birth Weight Preterm Infants Treated With Poractant Alfa versus Beractant for Respiratory Distress Syndrome.

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Background: Some controlled trials have shown significant differences in short-term clinical outcomes between poractant alfa and beractant in infants with respiratory distress syndrome (RDS). There is, however, no study showing the differences in long-term outcomes with these treatments. Aim: To determine and compare the neurodevelopmental outcomes of preterm infants with RDS treated with poractant alfa or beractant at 2 years of age.Methods This was a prospective, longitudinal, single-center cohort study of infants born at ≤1,500 g and/or ≤32 weeks between 2008 and 2009 who received either poractant alfa (n = 113) or beractant (n = 102) for RDS. Neurological and developmental assessments were performed at a corrected age of 18 to 24 months. Results: About 33 of 113 infants (29.2%) in the poractant alfa group had neurodevelopmental impairment compared with 36 of 102 (35.2%) in the beractant group, and the results did not differ between the groups (p = 0.339). Similarly, no significant difference was found in the percentage of infants with cerebral palsy (11.5 vs. 16.7%, respectively; p = 0.275). Conclusion: Our findings suggest that poractant alfa and beractant are similar in terms of neurodevelopmental outcomes when used for the treatment of RDS in preterm infants.

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PMID: 23884719 [PubMed - as supplied by publisher]

18. Evid Based Child Health. 2013 Jan;8(1):204-49. doi: 10.1002/ebch.1898.

Cochrane Review: Prophylactic phototherapy for preventing jaundice in preterm or low birth weight infants.

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BACKGROUND: Low birth weight and premature infants are at major risk for exaggerated hyperbilirubinaemia and jaundice that can lead to bilirubin encephalopathy. Phototherapy is the most common treatment for neonatal hyperbilirubinaemia and could be most effective in preventing the sequelae of hyperbilirubinaemia if initiated prophylactically. OBJECTIVES: To evaluate the efficacy and safety of prophylactic phototherapy for preterm (< 37 weeks gestational age) or low birth weight infants (birth weight < 2500 g). SEARCH METHODS: We searched the Cochrane Central Register of Controlled Trials (CENTRAL, The Cochrane Library, Issue 3) on 31 March 2011, MEDLINE (1950 to 31 March 2011), EMBASE (1980 to 31 March 2011) and CINAHL (1982 to 31 March 2011). SELECTION CRITERIA: Randomised controlled trials or quasi-randomised controlled studies evaluating the effects of prophylactic phototherapy for preterm or low birth weight infants. DATA COLLECTION AND ANALYSIS: Two authors independently obtained data from published articles. We performed fixed-effect meta-analysis for the outcomes: rate of exchange transfusion, cerebral palsy or other neurodevelopmental impairment, peak serum bilirubin level and all-cause mortality. MAIN RESULTS: Nine studies of 3449 participants were included. The rate of exchange transfusion was reduced in one study with liberal transfusion criteria (risk ratio (RR) 0.20; 95% confidence interval (CI) 0.13 to 0.31) but not in the other two more recent studies with stringent criteria (typical RR 0.66; 95% CI 0.19 to 2.28). There was no statistically significant difference in the rate of cerebral palsy (typical RR 0.96; 95% CI 0.50 to 1.85; two studies, 756 participants). However, one large study that reported on neurodevelopmental impairment (a composite outcome including cerebral palsy) found a slightly lower rate of neurodevelopmental impairment with prophylactic phototherapy (RR 0.85; 95% CI 0.74 to 0.99; 1804 participants). The prophylactic phototherapy group had lower peak bilirubin levels (mean difference (MD) -2.73; 95% CI -2.89 to -2.57; six studies, 2319 participants) and had fewer neonates with peak unconjugated serum bilirubin levels > 10 mg/dl (typical RR 0.27; 95% CI 0.22 to 0.33; three studies, 1090 participants) or peak unconjugated serum bilirubin levels > 15 mg/dl (typical RR 0.13; 95% CI 0.07 to 0.23; four studies, 1116 participants). There was no statistically significant difference in the rate of all-cause mortality between the two groups (typical RR 1.08; 95% CI 0.93 to 1.26; four studies, 3044 participants). AUTHORS' CONCLUSIONS: Prophylactic phototherapy helps to maintain a lower serum bilirubin concentration and may have an effect on the rate of exchange transfusion and the risk of neurodevelopmental impairment. However, further well-designed studies are needed to determine the efficacy and safety of prophylactic phototherapy on long-term outcomes including neurodevelopmental outcomes. PLAIN LANGUAGE SUMMARY: Prophylactic phototherapy for preventing jaundice in preterm very low birth weight infants Preterm (< 37 weeks gestational age) or low birth weight (LBW; birth weight < 2500 g) infants have a greater risk of developing jaundice compared to term or normal birth weight infant. This can be concerning because jaundice (caused by high levels of serum unconjugated bilirubin) could lead to permanent brain damage and/or death. In this review we evaluated the efficacy and safety of prophylactic phototherapy in preventing jaundice in preterm or LBW infants. A total of nine clinical trials representing 3449 infants were included. The findings suggest that phototherapy initiated soon after birth (within 36 hours) for preterm or low birth weight infants may prevent the serum bilirubin from reaching a level that would require exchange transfusion and may reduce the risk of impairment of brain and central nervous system development. However, further well-designed studies are needed to evaluate the effects of prophylactic phototherapy on brain and central nervous system development and other long-term outcomes.

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19. Fetal Diagn Ther. 2013 Jul 23. [Epub ahead of print]

Neurodevelopment after Fetal Growth Restriction.

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Fetal growth restriction (FGR) can emerge as a complication of placental dysfunction and increases the risk for neurodevelopmental delay. Marked elevations of umbilical artery (UA) Doppler resistance that set the stage for cardiovascular and biophysical deterioration with subsequent preterm birth characterize early-onset FGR. Minimal, or absent UA Doppler abnormalities and isolated cerebral Doppler changes with subtle deterioration and a high risk for unanticipated term stillbirth are characteristic for late-onset FGR. Nutritional deficiency manifested in lagging head growth is the most powerful predictor of developmental delay in all forms of FGR. Extremes of blood flow resistance and cardiovascular deterioration, prematurity and intracranial hemorrhage increase the risks for psychomotor delay and cerebral palsy. In late-onset FGR, regional cerebral vascular redistribution correlates with abnormal behavioral domains. Irrespective of the phenotype of FGR, prenatal tests that provide precise and independent stratification of risks for adverse neurodevelopment have yet to be determined.

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20. Int J Mol Sci. 2013 Jul 4;14(7):13858-72. doi: 10.3390/ijms140713858.

Death associated protein kinases: molecular structure and brain injury.

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Perinatal brain damage underlies an important share of motor and neurodevelopmental disabilities, such as cerebral palsy, cognitive impairment, visual dysfunction and epilepsy. Clinical, epidemiological, and experimental studies have revealed that factors such as inflammation, excitotoxicity and oxidative stress contribute considerably to both white and grey matter injury in the immature brain. A member of the death associated protein kinase (DAPk) family, DAPk1, has been implicated in cerebral ischemic damage, whereby DAPk1 potentiates NMDA receptor-mediated excitotoxicity through interaction with the NR2BR subunit. DAPk1 also mediate a range of activities from autophagy, membrane blebbing and DNA fragmentation ultimately leading to cell death. DAPk mRNA levels are particularly highly expressed in the developing brain and thus, we hypothesize that DAPk1 may play a role in perinatal brain injury. In addition to reviewing current knowledge, we present new aspects of the molecular structure of DAPk domains, and relate these findings to interacting partners of DAPk1, DAPk-regulation in NMDA-induced cerebral injury and novel approaches to blocking the injurious effects of DAPk1.

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21. J Pediatr. 2013 Aug;163(2):587-92. doi: 10.1016/j.jpeds.2013.03.055. Epub 2013 Apr 24.

Fuzzy images: ethical implications of using routine neuroimaging in premature neonates to predict neurologic outcomes.

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22. Pediatrics. 2013 Jul 22. [Epub ahead of print]

Neonatal Infection and 5-year Neurodevelopmental Outcome of Very Preterm Infants.

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OBJECTIVE: To determine whether neonatal infections are associated with a higher risk of adverse neurodevelopment at 5 years of age in a population-based cohort of very preterm children. METHODS: We included all live births between 22 and 32 weeks of gestation, from 9 regions in France, in 1997 (EPIPAGE study). Of the 2665 live births, 2277 were eligible for a follow-up evaluation at 5 years of age: 1769 had a medical examination and 1495 underwent cognitive assessment. Cerebral palsy and cognitive impairment were studied as a function of early-onset sepsis (EOS) and late-onset sepsis (LOS), after adjustment for potential confounding factors, in multivariate logistic regression models. RESULTS: A total of 139 (5%) of the 2665 live births included in the study presented with EOS alone (without associated LOS), 752 (28%) had LOS alone (without associated EOS), and 64 (2%) displayed both EOS and LOS. At 5 years of age, the frequency of cerebral palsy was 9% (157 of 1769) and that of cognitive impairment was 12% (177 of 1495). The frequency of cerebral palsy was higher in infants with isolated EOS (odds ratio [OR]: 1.70 [95% confidence interval (CI): 0.84-3.45]) or isolated LOS (OR: 1.71 [95% CI: 1.14-2.56]) than in uninfected infants, and this risk was even higher in cases of combined EOS and LOS (OR: 2.33 [95% CI: 1.02-5.33]). There was no association between neonatal infection and cognitive impairment. CONCLUSIONS: Neonatal infections in these very preterm infants were associated with a higher risk of cerebral palsy at the age of 5 years, particularly in infants presenting with both EOS and LOS.

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23. Stroke. 2013 Jun;44(6 Suppl 1):S104-6. doi: 10.1161/STROKEAHA.111.000037.

Motor system plasticity in stroke models: intrinsically use-dependent, unreliably useful.

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