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NEWS
Cerebral Palsy Research

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Interventions and Management

1. Development of the quality of reaching in infants with cerebral palsy: a kinematic study.

Boxum AG, La Bastide-Van Gemert S, Dijkstra LJ, Hamer EG, Hielkema T, Reinders-Messelink HA, Hadders-Algra M.

Dev Med Child Neurol. 2017 Sep 6. doi: 10.1111/dmcn.13538. [Epub ahead of print]

AIM: To assess development of reaching and head stability in infants at very high risk (VHR-infants) of cerebral palsy (CP) who did and did not develop CP. METHOD: This explorative longitudinal study assessed the kinematics of reaching and head sway in sitting in 37 VHR-infants (18 CP) one to four times between 4.7 months and 22.6 months corrected age. Developmental trajectories were calculated using linear mixed effect models. Motor function was evaluated with the Infant Motor Profile (IMP) around 13 months corrected age. RESULTS: Throughout infancy, VHR-infants with CP had a worse reaching quality than infants without CP, reflected for example by more movement units (factor 1.52, 95% CI 1.16-1.99) and smaller transport movement units (factor 1.86, 95% CI 1.20-2.90). Total head sway of infants with and without CP was similar, but infants with CP used more head movement units to achieve stability. The rate of developmental change in infants with and without CP was similar. Around 13 months, head control and reaching quality were interrelated; both were associated with IMP-scores. INTERPRETATION: Infants with CP showed a worse kinematic reaching quality and head stability throughout infancy from early age onwards than VHR-infants without CP, implying that kinematically they do not grow into a deficit, but exhibit deficits from early infancy on.

PMID: 28877349

2. Neurophysiological mechanisms and functional impact of mirror movements in children with unilateral spastic cerebral palsy: a systematic review.

Kuo HC, Friel KM, Gordon AM.

Dev Med Child Neurol. 2017 Sep 8. doi: 10.1111/dmcn.13524. [Epub ahead of print]

Children with unilateral spastic cerebral palsy (CP) often have mirror movements, i.e. involuntary imitations of unilateral voluntary movements of the contralateral upper extremity. The pathophysiology of mirror movements has been investigated in small and heterogeneous cohorts in the literature. Specific pathophysiology of mirror movements and their impact on upper extremity function require systematic investigation in larger and homogeneous cohorts of children with unilateral spastic CP. Here we review two possible neurophysiological mechanisms underlying mirror movements in children with CP and those with typical development: (1) an ipsilateral corticospinal tract projecting from the contralesional motor cortex (M1) to both upper extremities; (2) insufficient interhemispheric inhibition between the two M1s. We also discuss clinical implications of mirror movements in children with unilateral CP and suggest that a thorough examination of the relationship between the pathophysiology and clinical manifestations of mirror movements is warranted. We suggest two premises: (1) the presence of mirror movements is indicative of an ipsilateral corticospinal tract reorganization; and (2) the corticospinal tract organization

may affect patients' responses to certain treatment. If these premises are supported through future research, mirror movements should be clinically evaluated for patient selection to maximize benefits of therapy, hence promoting individualized medicine in this population.

PMID: 28884806

3. Development of a Robotic System for Enhancing Children's Motivation in Constraint Induced Movement Therapy (CIMT).

Psychouli P, Cheng P, Dimopoulos C.

Stud Health Technol Inform. 2017;242:479-483.

This paper presents a novel robotic system, which aims to enhance children's motivation through the gamification of the CIMT process. The system offers adjustability of the required movement skills, ensuring children will put increasingly more effort to achieve the rehabilitation goal, while keeping the task fun and engaging.

PMID: 28873842

4. The Feasibility and Validity of Body-Worn Sensors to Supplement Timed Walking Tests for Children with Neurological Conditions.

Sivarajah L, Kane KJ, Lanovaz J, Bisaro D, Oates A, Ye M, Musselman KE.

Phys Occup Ther Pediatr. 2017 Sep 7:1-11. doi: 10.1080/01942638.2017.1357066. [Epub ahead of print]

AIMS: The 10-meter walk test (10 mWT) and Timed Up and Go (TUG) are assessments of speed/time with a ceiling effect in pediatric populations. This study aimed to (1) determine whether collecting spatiotemporal data with inertial sensors (Mobility Lab, APDM Inc.) during these tests improves their discriminative validity, and (2) evaluate the clinical feasibility of Mobility Lab. METHODS: Fifteen children with spina bifida (SB) or cerebral palsy (CP) (7.9 ± 3.1 years old) and fifteen age- and sex-matched typically-developing (TD) children completed the 10 mWT and TUG wearing Mobility Lab. Spatiotemporal data were compared between groups. Mobility Lab's potential to distinguish children with SB/CP from TD children was examined using conditional logistic regression. Feasibility was evaluated through participant adherence and a clinical utility scale. RESULTS: For the 10 mWT, group differences ($p < 0.01$) were found in horizontal and frontal trunk range of motion, horizontal trunk velocity, and swing asymmetry. Children with SB/CP took significantly longer to turn during the TUG. These five variables together distinguished the two groups ($p = 0.006$). 78% of participants with SB/CP completed the testing protocol. Mobility Lab scored 4/10 on the clinical utility scale. CONCLUSIONS: Instrumenting the 10 mWT and TUG improves the tests' ability to discriminate between children with SB/CP and TD children.

PMID: 28880702

5. Effects of neuromuscular electrical stimulation and kinesio taping applications in children with cerebral palsy on postural control and sitting balance.

Elbasan B, Akkaya KU, Akyüz M, Oskay D.

J Back Musculoskelet Rehabil. 2017 Aug 21. doi: 10.3233/BMR-169656. [Epub ahead of print]

BACKGROUND: Neurodevelopmental treatment (NDT), neuromuscular electrical stimulation (NMES), and Kinesio Taping (KT) applications are separately used to improve postural control and sitting balance in children with cerebral palsy (CP). OBJECTIVE: The aim of this study is to examine the combined effect of NDT, NMES and KT applications on postural control and sitting balance in children with CP. METHODS: Forty five children, in 3 groups, between the ages 5-12 years were included in the study. Group 1 received NDT; group 2 received NDT + NMES; and the group 3 received NDT + NMES + KT for 6 weeks. Sitting function evaluated by the sitting section of the gross motor function measure (GMFM), and postural

control assessed with the seated postural control measurement (SPCM). RESULTS: Seating section of GMFM was improved significantly in all the groups; however, increases in the group 3 were higher than groups 1 and 2 (p= 0.001). While significant differences were observed in all groups in the SPCM posture (p< 0.001), function (p< 0.001), and the total scores (p< 0.001); the change in the third group was higher according to the comparison of the three groups within each other. CONCLUSIONS: Implementation of the NMES, and KT additionally to NDT improve the sitting posture, postural control, seating function, and gross motor function in children with CP.

PMID: 28869434

6. Hip Surveillance for Children With Cerebral Palsy: A Survey of the POSNA Membership.

Shore BJ, Shrader MW, Narayanan U, Miller F, Graham HK, Mulpuri K.

J Pediatr Orthop. 2017 Oct/Nov;37(7):e409-e414. doi: 10.1097/BPO.0000000000001050.

BACKGROUND: Currently, hip surveillance programs for children with cerebral palsy exist in Europe, Australasia, and parts of Canada, but a neuromuscular hip surveillance program has yet to be adopted in the United States. The purpose of this study was to report the current orthopaedic practice of hip surveillance in children with cerebral palsy, identify areas of practice variation, and suggest steps moving forward to generate guidelines for national neuromuscular hip surveillance. METHODS: The entire membership of the Pediatric Orthopaedic Society of North America (POSNA) was surveyed in 2016 for information regarding their practice for hip surveillance in children with cerebral palsy. Detailed information regarding timing, frequency, and practice of hip surveillance was obtained in answers to 26 different questions. RESULTS: A survey response rate of 27% was obtained (350/1300 members) during the study period. The majority of respondents treated pediatric patients exclusively (97%), worked in an academic practice (70%), and was affiliated with a university (76%). In total, 18% (69/350) of respondents followed a regular cerebral palsy hip surveillance program, about half of whom (44%, 30/69) had adopted the Australian guidelines. Respondents agreed that a dislocated hip in a child with cerebral palsy was painful (90% agreement) and should be prevented by hip surveillance (93% agreement). Furthermore, 93% of respondents indicated they would follow a national surveillance program if one was in place. Age (79%), Gross Motor Function Classification System (81%), and migration percentage (MP) (78%) were all identified as critical elements to a hip surveillance program. The majority of respondents felt that a hip "at risk" for hip displacement had a MP between 20% and 30% (57% of respondents), whereas surgery should be utilized once the MP exceeded 40% (50% of respondents). CONCLUSIONS: Results from this survey demonstrate 90% of respondents agree that a dislocated hip could be painful and 93% would follow a national surveillance program if available. At a societal level, we have the ability to standardize cerebral palsy hip surveillance, thereby decreasing practice variation and improving quality of care delivery.

PMID: 28877095

7. Pharmacogenomic Variability of Oral Baclofen Clearance and Clinical Response in Children with Cerebral Palsy.

McLaughlin MJ, He Y, Brunstrom-Hernandez J, Thio LL, Carleton BC, Ross CJD, Gaedigk A, Lewandowski A, Dai H, Jusko WJ, Leeder JS.

PM R. 2017 Aug 31. pii: S1934-1482(17)30089-8. doi: 10.1016/j.pmrj.2017.08.441. [Epub ahead of print]

BACKGROUND: Pharmacogenomic variability can contribute to differences in pharmacokinetics and clinical responses. Pediatric patients with cerebral palsy (CP) with genetic variations have not been studied for these potential differences. OBJECTIVE: To determine the genetic sources of variation in oral baclofen clearance and clinical responses. DESIGN: Pharmacogenomic add-on study to determine variability in oral baclofen clearance and clinical responses. SETTING: Multicenter study based in academic pediatric cerebral palsy clinics. PARTICIPANTS: 49 patients with CP who had participated in an oral baclofen Pharmacokinetic/Pharmacodynamic (PK/PD) study. METHODS: or Interventions: From 53 participants in a PK/PD trial, 49 underwent genetic analysis of 307 key genes and 4,535 single-nucleotide polymorphisms (SNPs) involved in drug absorption, distribution, metabolism and excretion. Associations between genotypes and phenotypes of baclofen disposition (weight-corrected and allometrically scaled clearance) and clinical endpoints (improvement from baseline in mean hamstring Modified Tardieu Scale (MTS) scores from baseline for improvement of R1 spastic catch) were determined by univariate analysis with correction for multiple testing by false discovery rate (FDR). MAIN OUTCOME MEASUREMENTS: Primary outcome measures were the genotypic and phenotypic variability of oral baclofen in allometrically scaled clearance and change in the MTS angle compared to baseline. RESULTS: After univariate analysis of the data, the SNP of ABCC9 (rs11046232, heterozygous AT vs. the reference TT genotype) was associated with a 2-fold increase

in oral baclofen clearance (Mean 0.51 ± Standard Deviation 0.05 L/hr/kg for the AT genotype vs. 0.25 ± 0.07 L/hr/kg for the TT genotype, adjusted p<.001). Clinical responses were associated with decreased spasticity by MTS in allelic variants with SNPs ABCC12, SLC28A1, and PPARD. CONCLUSIONS: Genetic variation in ABCC9 impacting oral baclofen clearance highlights the need for continued studies of genetic polymorphisms to better characterize variable drug response in children with CP. Single nucleotide polymorphisms in ABCC12, SLC28A1, and PPARD were associated with varied responses, which warrants further investigation to determine their effect on spasticity.

PMID: 28867665

8. Efficacy of oral pharmacological treatments in dyskinetic cerebral palsy: a systematic review.

Masson R, Pagliano E, Baranello G.

Dev Med Child Neurol. 2017 Sep 5. doi: 10.1111/dmcn.13532. [Epub ahead of print]

AIM: To evaluate the actual evidence of efficacy of oral pharmacological treatments in the management of dyskinetic cerebral palsy (CP). METHOD: A systematic review was performed according to the American Academy for Cerebral Palsy and Developmental Medicine (AACPDM) and Preferred Reporting Items for Systematic Reviews and Meta-Analyses methodology. Articles were searched for in PubMed/MEDLINE, Scopus, Web of Science, Cochrane Library, Database of Reviews of Effectiveness, OTSeeker, Physiotherapy Evidence Database, REHABDATA, and ClinicalTrials.gov. RESULTS: Sixteen articles met the eligibility criteria. Eight studies on trihexyphenidyl and two on levodopa showed contradictory results. Low efficacy was reported for diazepam, dantrolene sodium, perphenazine, and etybenzatropine. Tetrabenazine, gabapentin and levetiracetam should be studied in more detail. The updated available evidence does not support any therapeutic algorithm for the management of dyskinetic CP. INTERPRETATION: This lack of evidence is partially owing to the inconsistency of classifications of patients and of outcome measures used in the reviewed studies. Further randomized, double-blind, placebo-controlled pharmacological trials, optimized for different age groups, based on valid, reliable, and disease-specific rating scales are strongly needed. Outcome measures should be selected within the framework of the International Classification of Functioning, Disability and Health.

PMID: 28872668

9. Long Term Effects of Orthoses Use on the Changes of Foot and Ankle Joint Motions of Spastic CP Children.

Liu XC, Embrey D, Tassone C, Zvara K, Brandsma B, Lyon R, Goodfriend K, Tarima S, Thometz J.

PM R. 2017 Aug 31. pii: S1934-1482(17)30004-7. doi: 10.1016/j.pmrj.2017.08.438. [Epub ahead of print]

BACKGROUND: Orthoses are commonly prescribed to children with cerebral palsy (CP) in order to provide foot correction and to improve ambulatory function. Immediate effects of ankle foot orthosis (AFOs) have been investigated, but long term kinematic effects are lacking clinical evidence. OBJECTIVE: To determine changes in pediatric patients with Cerebral Palsy's 3D ankle and foot segment motion between initial, and follow up visits (18 month average time differences) in both barefoot gait and gait with their ankle foot orthotic (AFO). We will also investigate intra visit changes between barefoot and AFO gait. DESIGN: A prospective cohort study. SETTING: Children's Hospital of Wisconsin, Department of Orthopaedic Surgery. Medical College of Wisconsin. PATIENTS: A total of 23 children with CP, mean age 10.5 years (6.2 to 18.1) were clinically prescribed either a solid ankle foot orthotic (SAFO), hinged ankle foot orthotic (HAFO), or supramalleolar orthotic (SMO). METHODS: Holes were cut in the study orthoses so that electromagnetic markers could be directly placed on the skin. A 6 foot segment model (6SF) was used. OUTCOME MEASUREMENTS: Kinematic and kinetic data was recorded for each patient's initial and follow up visit (18 month follow up average, 15 to 20 months range) RESULTS: For the SAFO group (gait with AFO), a significant decrease in dorsiflexion was found between the initial and third visit (p=.008). Furthermore, the SAFO group (barefoot gait), had an increased eversion at the midfoot for most of the gait cycle (p < .008). Sagittal forefoot ROM is reduced for all three groups between the barefoot and AFO groups. CONCLUSION: Use of AFOs long term either maintained or improved foot deformities or dysfunction.

PMID: 28867667

10. Infant Discovery Learning and Lower Extremity Coordination: Influence of Prematurity.

Sargent B, Kubo M, Fetters L.

Phys Occup Ther Pediatr. 2017 Sep 8:1-16. doi: 10.1080/01942638.2017.1357065. [Epub ahead of print]

AIMS: Preterm infants at increased risk for neurodevelopmental disabilities, including cerebral palsy, demonstrate reduced selective leg joint coordination. Full-term infants demonstrate more selective hip-knee coordination when specific leg actions are reinforced using an overhead infant mobile. The purpose of this pilot study was to determine the ability of preterm infants to: (1) perform and learn through discovery, the contingency between leg action and mobile activation, and (2) demonstrate more selective hip-knee coordination when leg actions are reinforced with mobile activation. METHODS: At both 3 and 4-months corrected age, ten infants born very preterm and with very low birth weight participated in 2 sessions of mobile reinforcement on consecutive days. RESULTS: The preterm group at 4-months, but not 3-months, learned the contingency between leg action and mobile activation. Preterm infants at 4-months were separated into those that learned (n = 6) and did not learn (n = 4) the contingency. As a group, preterm infants at 4-months who learned the contingency, did not demonstrate more selective hip-knee coordination when interacting with the mobile on Day 2 as compared to spontaneous kicking on Day 1. CONCLUSIONS: Preterm infants, as compared to full-term infants, may have difficulty producing more selective hip-knee coordination during task-specific leg action.

PMID: 28885092

11. [Brain plasticity and early rehabilitative care for children after neonatal arterial cerebral infarction].

[Article in French]

Dinomais M, Marret S, Vuillerot C.

Arch Pediatr. 2017 Sep;24(9S):9S61-9S68. doi: 10.1016/S0929-693X(17)30333-0.

Currently, in the literature of the evidence based medicine, little data are available to confirm the benefit and the specific procedures of an early intervention for a neonatal arterial ischemic stroke. However, data about the effect of an early physical rehabilitation program on the cerebral plasticity, and preliminary results of clinical studies in children with cerebral palsy strongly suggest the benefit of an early rehabilitation with a multidisciplinary approach. The type of the rehabilitation and its frequency must be determined because a wide variability in the practices exists. A comprehensive care, of the children and his family is necessary to limit the orthopaedics but also the social consequences of a neonatal stroke.

PMID: 28867040

12. Parent-reported indicators for detecting feeding and swallowing difficulties and undernutrition in preschool-aged children with cerebral palsy.

Benfer KA, Weir KA, Ware RS, Davies PSW, Arvedson J, Boyd RN, Bell KL.

Dev Med Child Neurol. 2017 Sep 6. doi: 10.1111/dmcn.13498. [Epub ahead of print]

AIM: To determine the most accurate parent-reported indicators for detecting (1) feeding/swallowing difficulties and (2) undernutrition in preschool-aged children with cerebral palsy (CP). METHOD: This was a longitudinal, population-based study, involving 179 children with CP, aged 18 to 60 months (mean 34.1mo [SD 11.9] at entry, 111 males, 68 females [Gross Motor Function Classification System level I, 84; II, 23; III, 28; IV, 18; V, 26], 423 data points). Feeding/swallowing difficulties were determined by the Dysphagia Disorders Survey and 16 signs suggestive of pharyngeal phase impairment. Undernutrition was indicated by height-weight and skinfold composite z-scores less than -2. Primary parent-reported indicators included mealtime duration, mealtime stress, concern about growth, and respiratory problems. Other indicators were derived from a parent feeding questionnaire, including 'significant difficulty eating and drinking'. Data were analysed using multilevel mixed-effects regression and diagnostic statistics. RESULTS: Primary parent-reported indicators associated with feeding/swallowing were 'moderate-severe parent stress' (odds ratio [OR]=3.2 [95% confidence interval {CI} 1.3-7.8]; p<0.01), 'moderate-severe concern regarding growth' (OR=4.5 [95% CI 1.7-11.9]; p<0.01), and 'any respiratory condition' (OR=1.8 [95% CI 1.4-5.8]; p<0.01). The indicator associated with undernutrition was 'moderate-severe concern regarding growth' (height-weight OR=13.5 [95% CI 3.0-61.3]; p<0.01; skinfold OR=19.1 [95% CI 3.7-98.9]; p<0.01). 'Significant difficulty eating and drinking' was most sensitive/specific for feeding outcome (sensitivity=58.6%, specificity=100.0%), and

'parent concern regarding growth' for undernutrition (sensitivity=77.8%, specificity=77.0%). INTERPRETATION: Parent-reported indicators are feasible for detecting feeding and swallowing difficulties and undernutrition in children with CP, but need formal validation.

PMID: 28877337

13. Parent Perception of Two Eye-Gaze Control Technology Systems in Young Children with Cerebral Palsy: Pilot Study.

Karlsson P, Wallen M.

Stud Health Technol Inform. 2017;242:1095-1102.

Eye-gaze control technology enables people with significant physical disability to access computers for communication, play, learning and environmental control. This pilot study used a multiple case study design with repeated baseline assessment and parents' evaluations to compare two eye-gaze control technology systems to identify any differences in factors such as ease of use and impact of the systems for their young children. Five children, aged 3 to 5 years, with dyskinetic cerebral palsy, and their families participated. Overall, families were satisfied with both the Tobii PCEye Go and myGaze® eye tracker, found them easy to position and use, and children learned to operate them quickly. This technology provides young children with important opportunities for learning, play, leisure, and developing communication.

PMID: 28873936

14. Influences on students' assistive technology use at school: the views of classroom teachers, allied health professionals, students with cerebral palsy and their parents.

Karlsson P, Johnston C, Barker K.

Disabil Rehabil Assist Technol. 2017 Sep 7:1-9. doi: 10.1080/17483107.2017.1373307. [Epub ahead of print]

PURPOSE: This study explored how classroom teachers, allied health professionals, students with cerebral palsy, and their parents view high-tech assistive technology service delivery in the classroom. METHODS: Semi-structured interviews with six classroom teachers and six parents and their children were conducted. Additionally, two focus groups comprising 10 occupational therapists and six speech pathologists were carried out. Ethical and confidentiality considerations meant that the groups were not matched. RESULTS: Results revealed that it is often untrained staff member who determine students' educational needs. The participants' experiences suggested that, particularly in mainstream settings, there is a need for support and guidance from a professional with knowledge of assistive technology who can also take a lead and guide classroom teachers in how to meet students' needs. Students' motivation to use the technology was also found to be critical for its successful uptake. CONCLUSIONS: The study points to the need for classroom teachers to be given sufficient time and skill development opportunities to enable them to work effectively with assistive technology in the classroom. The participants' experiences suggest that such opportunities are not generally forthcoming. Only in this way can it be ensured that students with disabilities receive the education that is their right. Implications for Rehabilitation Classroom teachers, allied health professionals, students, parents need ongoing support and opportunities to practise operational, strategic and linguistic skills with the assistive technology equipment. System barriers to the uptake of assistive technology need to be addressed. To address the lack of time available for training, programing and other support activities around assistive technology, dedicated administrative support is crucial. Professional development around the use of the quality low cost ICF-CY checklist is recommended for both school and allied health staff.

PMID: 28880695

15. Understanding allied health practitioners' use of evidence-based assessments for children with cerebral palsy: a mixed methods study.

O'Connor B, Kerr C, Shields N, Imms C.

Disabil Rehabil. 2017 Sep 6:1-13. doi: 10.1080/09638288.2017.1373376. [Epub ahead of print]

PURPOSE: Evidence-based assessments for children with cerebral palsy are not widely used by healthcare professionals in day-to-day practice. This study aimed to examine allied health practitioner experiences, perceptions, and use of assessments for children with cerebral palsy. METHOD: A mixed methods study was conducted in two rehabilitation organisations. Three focus group interviews explored therapists' assessment experiences with data analysed using interpretive description. Assessment practices of therapists (n = 55) were assessed through self-report questionnaire and case-file audit of children with cerebral palsy (n = 44). RESULTS: Emergent themes described therapists' motivation to use evidence-based assessments on a behavioural continuum - I don't; I can't; I try; I do; We do; influenced by assessment satisfaction, child and family collaboration, organisational expectation, research fit, and time dedication. Only two of fifteen audited assessments were documented in more than 50% of files. Use was higher where assessments positively connected therapists, children and parents, and use was organisationally endorsed. The Cultural Cone for evidence-based assessment behaviour was conceptualised. CONCLUSIONS: "Engagement in" assessment appears to require a conceptual shift by therapists and organisations to understanding assessment as part of, not an adjunct to, therapy. The Cultural Cone framework may assist therapists and services in designing strategies to promote evidence-based assessment behaviours. Implications for rehabilitation Therapists' can reflect on where they are positioned on the "use continuum" in the Cultural Cone framework, and consider the contextual influences contained in this framework to understand their motivation to use evidence-based assessments. Routine use of evidenced-based assessments for children with cerebral palsy by allied health practitioners remains generally low and therapists and service organisations need to consider ways to increase use. Where possible, therapists' should choose assessment tools that fully engage children and families and themselves in the assessment process. The Cultural Cone framework may be used to assist therapists and organisations identify and design site specific strategies to increase evidence-based assessment use in day-to-day practice.

PMID: 28877650

Prevention and Cure

16. Retraction.

Regen Med. 2017 Sep 5:575. doi: 10.2217/rme-2017-0043r1. [Epub ahead of print]

Since the following case report was found not to meet the ethical standards of Juntendo University, as previously stated by the authors, the article has been retracted from Regenerative Medicine: Kantake M, Hirano A, Sano M, Urushihata N, Tanemura H, Oki K, Suzaki E. Transplantation of allogeneic adipose-derived mesenchymal stem cells in a cerebral palsy patient. Regenerative Medicine doi:10.2217/rme-2017-0043 (2017) (Epub ahead of print). The authors and editors of Regenerative Medicine regret any negative consequences this publication might have caused in the scientific and medical communities.

PMID: 28872452

17. Ganaxolone: A New Treatment for Neonatal Seizures.

Yawno T, Miller SL, Bennet L, Wong F, Hirst JJ, Fahey M, Walker DW.

Front Cell Neurosci. 2017 Aug 22;11:246. doi: 10.3389/fncel.2017.00246. eCollection 2017.

Neonatal seizures are amongst the most common neurologic conditions managed by a neonatal care service. Seizures can exacerbate existing brain injury, induce "de novo" injury, and are associated with neurodevelopmental disabilities in post-neonatal life. In this mini-review, we present evidence in support of the use of ganaxolone, a GABAA agonist neurosteroid, as a novel neonatal therapy. We discuss evidence that ganaxolone can provide both seizure control and neuroprotection with a high safety profile when administered early following birth-related hypoxia, and show evidence that it is likely to prevent or reduce the incidence of the enduring disabilities associated with preterm birth, cerebral palsy, and epilepsy. We suggest that

ganaxolone is an ideal anti-seizure treatment because it can be safely used prospectively, with minimal or no adverse effects on the neonatal brain.

PMID: 28878622

18. Convulsive status epilepticus in a quaternary hospital paediatric intensive care unit (PICU) in South Africa: An 8 year review.

Reddy Y, Balakrishna Y, Mubaiwa L.

Seizure. 2017 Aug 2;51:55-60. doi: 10.1016/j.seizure.2017.07.016. [Epub ahead of print]

PURPOSE: Convulsive status epilepticus (CSE) is associated with a high morbidity and mortality. This study aimed to describe the clinical profile, aetiology, neuroimaging and EEG findings as well as outcome of children with CSE in Sub-Saharan Africa. METHODS: This was a retrospective analysis of electronic records of children with CSE admitted to the Paediatric Intensive Care Unit (PICU) over an 8-year period from January 2007 to December 2014. RESULTS: Seventy six patients were admitted to the PICU with CSE and 55(72%) had refractory status epilepticus. The median age at presentation was 15 months (IQR 6-37 months). The main aetiologies were meningoencephalitis and gastroenteritis in 33(43%) and 19(25%) patients respectively. The most frequently used antiepileptic drugs for CSE in PICU consisted of infusions of midazolam (96%) and thiopentone (22%). Neuroimaging findings were abnormal in 53(75%) patients with hypoxic changes in 17 patients. On multivariable regression, the predictors of poor outcome included the use of more than 3 antiepileptic drugs in PICU(RR-1.41(1.12-1.78), p=0.003), duration of mechanical ventilation for more than 3days (RR 1.98(1.22-3.20), p=0.005) and abnormal neuroimaging findings (RR 3.21(1.53-6.72), p=0.002). The mortality rate was 24%(n=18). Persistent seizures or a new neurological deficit occurred in 58%(n=44). The main cause of mortality was CSE related diffuse cortical and brainstem injury. Predominant neurological sequelae were cerebral palsy and persistent epilepsy. CONCLUSION: The high burden of infection related CSE is associated with high morbidity and mortality rates in contrast to the rates in developed countries. This highlights the need for early recognition and treatment of underlying conditions.

PMID: 28886496

19. [Long term outcome of perinatal stroke].

[Article in French]

Vuillerot C, Marret S, Dinomais M.

Arch Pediatr. 2017 Sep;24(9S):9S51-9S60. doi: 10.1016/S0929-693X(17)30332-9.

Neonatal Arterial Ischemic Stroke (NAIS) affects 6-17 newborns on 100 000-birth term neonates, most of these children keeping long-term motor and cognitive impairments. Based on a literature review, the objectives of this paper are to describe motor and cognitive outcomes after a NAIS and to propose a consensual monitoring of these children to improve their management. About 30 % of children after a NAIS will develop a unilateral cerebral palsy requiring a management by a team with expertise in physical medicine and rehabilitation. Unlike adults, especially after a left NAIS, children will not present aphasia but between 50 and 90 % will present disorders of speech and language in expression and/or reception. After NAIS, the global intellectual efficiency is usually preserved except when the size of the lesion is very important or when severe epilepsy occurs. Several studies are also in favor of vulnerability in visuospatial functions. To quantify impairments, activity limitations and participation restrictions resulting from this NAIS, early and at least yearly evaluations with reliable tools must be carried out systematically until puberty. A multidisciplinary team with a longitudinal follow-up, in all the different developmental dimensions, must conduct these evaluations in term of motor skills, cognitive impairment, behavior, autonomy, quality of life, and participation. Consequences on family functioning need to be evaluate in order to help children and family coping with this event.

PMID: 28867039