Cerebral Palsy ALLIANCE

NEWS
Cerebral Palsy Research

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Interventions and Management

1. Sacral-Alar-Iliac Fixation in Children with Neuromuscular Scoliosis: Minimum 5-Year Follow-Up.

Jain A, Sullivan BT, Kuwabara A, Kebaish K, Sponseller PD.

World Neurosurg. 2017 Sep 5. pii: S1878-8750(17)31479-1. doi: 10.1016/j.wneu.2017.08.169. [Epub ahead of print]

OBJECTIVE: The aim of our study was to investigate the 5-year outcomes of children with neuromuscular scoliosis treated with sacral-alar-iliac screws. METHODS: We reviewed clinical and radiographic records of patients ≤18 years old treated by 1 pediatric orthopaedic surgeon for neuromuscular scoliosis with spinal fusion using sacral-alar-iliac pelvic anchors. Thirty-eight patients, with a minimum 5-year radiographic follow-up (6.0 ± 1.2 years), were studied. Mean patient age was 13 ± 2.0 years and 47% were female. The mean number of levels fused was 18 ± 0.7. The diagnosis was cerebral palsy in 66% of patients. RESULTS: Between the preoperative period and final follow-up there was a mean 79% correction of the major coronal curve (85° to 18°) and 57% correction of the pelvic obliquity (16° to 7°). Patients maintained correction of mean pelvic obliquity from the early postoperative period (6°) to final follow-up (7°). Preoperatively, 76% of patients had pelvic obliquity of >10°compared with 26% after surgery. There were no cases of neurologic or vascular complications or pseudarthrosis. Radiographs revealed bilateral sacral-alar-iliac screw lucency in 8 patients; 4 of these patients had deep wound infections, and the other 4 were asymptomatic. Unilateral screw fracture was found in 1 patient with an 8-mm screw diameter (1.3%, 1 of 76 screws); the patient was observed and remained asymptomatic. There were no cases of set screw displacement, screw back-out, or rod dislodgement. CONCLUSIONS: Sacral-alar-iliac screws are safe and effective pelvic anchors for use in children with neuromuscular scoliosis.

PMID: 28887279

2. Testing Gait with Ankle-Foot Orthoses in Children with Cerebral Palsy by Using Functional Mixed-Effects Analysis of Variance.

Zhang B, Twycross-Lewis R, Großmann H, Morrissey D.

Sci Rep. 2017 Sep 11;7(1):11081. doi: 10.1038/s41598-017-11282-1.

Existing statistical methods extract insufficient information from 3-dimensional gait data, rendering clinical interpretation of impaired movement patterns sub-optimal. We propose an alternative approach based on functional data analysis that may be worthy of exploration. We apply this to gait data analysis using repeated-measurements data from children with cerebral palsy who had been prescribed fixed ankle-foot orthoses as an example. We analyze entire gait curves by means of a new functional F test with comparison to multiple pointwise F tests and also to the traditional method - univariate repeated-measurements analysis of variance of joint angle minima and maxima. The new test maintains the nominal significance level and can be adapted to test hypotheses for specific phases of the gait cycle. The main findings indicate that ankle-foot orthoses exert significant effects on coronal and sagittal plane ankle rotation; and both sagittal and horizontal plane foot rotation. The

functional F test provided further information for the stance and swing phases. Differences between the results of the different statistical approaches are discussed, concluding that the novel method has potential utility and is worthy of validation through larger scale patient and clinician engagement to determine whether it is preferable to the traditional approach.

PMID: 28894132

3. Letter to the Editor on "Effects of Antigravity Treadmill Training on Gait, Balance, and Fall Risk in Children With Diplegic Cerebral Palsy".

Ammann-Reiffer C, Labruyère R.

Am J Phys Med Rehabil. 2017 Sep 14. doi: 10.1097/PHM.0000000000000827. [Epub ahead of print]

[No abstract available]

PMID: 28915201

4. Effects of inter-synergistic mechanical interactions on the mechanical behaviour of activated spastic semitendinosus muscle of patients with cerebral palsy.

Kaya CS, Temelli Y, Ates F, Yucesoy CA.

J Mech Behav Biomed Mater. 2017 Sep 3;77:78-84. doi: 10.1016/j.jmbbm.2017.08.040. [Epub ahead of print]

Previous physiological experiments and finite element modelling indicate that inter-synergistic epimuscular myofascial force transmission (EMFT) between co-activated muscles has a potential to affect healthy muscle's contribution to joint moment and joint range of movement. This is quite relevant for patients with cerebral palsy (CP) since, amplitude of spastic muscle's force and the joint range of force exertion are central to the joint movement limitation. Stiffness of activated spastic muscle is also a determinant for pathological joint movement. However, assessments of effects of inter-synergistic EMFT on the mechanical behaviour of spastic muscle are lacking. Those assessments require measurement during surgery of activated spastic muscle's forces directly at its tendon and as a function of joint angle. Employing this methodology, the aim was to test the following study hypotheses: added activation of semimembranosus (SM) and gracilis (GRA) muscles of patients with CP changes (1) force, (2) stiffness and (3) joint range of force exertion of activated spastic semitendinosus (ST) due to inter-synergistic EMFT. Isometric spastic ST forces were measured intraoperatively (12 limbs of 7 patients (mean age 8 years 9 months) for knee angles from flexion (120°) to full extension (0°). Conditions I and II: spastic ST was activated alone, and simultaneously with its synergists SM and GRA muscles, respectively. Condition II did increase activated spastic ST's forces significantly (by 33.3%), but did not change its stiffness and joint range of force exertion, confirming only study hypothesis 1. Therefore, we conclude that inter-synergistic EMFT affects forces exerted at spastic ST tendon, but not other characteristics of its angle-force relationship.

PMID: 28892760

5. Inter- and intra-rater reliability of the head-shaft angle in children with cerebral palsy.

Hermanson M, Hägglund G, Riad J, Rodby-Bousquet E.

J Child Orthop. 2017 Aug 1;11(4):256-262. doi: 10.1302/1863-2548.11.170008.

PURPOSE: Children with cerebral palsy (CP) are at increased risk for hip dislocation. This can be prevented in most cases using surveillance programmes that include radiographic examinations. Known risk factors for hip dislocation include young age, high Gross Motor Function Classification System (GMFCS) level and high migration percentage (MP). The head-shaft angle (HSA) has recently been described as an additional risk factor. The study aim was to determine inter- and intra-rater reliability of the HSA in a surveillance programme for children with CP. METHODS: We included hip radiographs from the CP surveillance programme CPUP in southern Sweden during the first half of 2016. Fifty radiographs were included from children at GMFCS levels II-V, with a mean age of 6.6 (SD 3.2) years. Three raters measured the HSA of one hip (left or right)

at baseline and four weeks later; intraclass correlation coefficient (ICC) was used to estimate inter- and intra-rater reliability. RESULTS: Inter- and intra-rater reliability were excellent for the HSA, with ICC 0.92 (95% CI 0.87-0.96) and ICC 0.99 (95% CI 0.98-0.99), respectively. CONCLUSION: The HSA showed excellent inter- and intra-rater reliability for children with CP, providing further evidence for use of the HSA as an additional factor for identifying risk for further hip displacement or dislocation.

PMID: 28904630

6. Guided Growth of the Proximal Femur for the Management of Hip Dysplasia in Children With Cerebral Palsy.

Portinaro N, Turati M, Cometto M, Bigoni M, Davids JR, Panou A.

J Pediatr Orthop. 2017 Sep 8. doi: 10.1097/BPO.0000000000001069. [Epub ahead of print]

BACKGROUND: Progressive hip displacement is one of the most common and debilitating deformities seen in children with cerebral palsy (CP). The aim of this study was to evaluate the results of temporary medial hemiepiphysiodesis of the proximal femur (TMH-PF) using a transphyseal screw to control hip migration during growth in children with CP. METHODS: This was a retrospective study of children with CP and hip dysplasia, age 4 to 11 years and GMFCS levels III-V. There were 28 patients with 56 hips that underwent TMH-PF surgery between 2007 and 2010. Clinical and radiologic evaluation was performed preoperatively, at 6, 12, and 60 months following the index surgery. Acetabular index (AI), neck-shaft angle (NSA) and migration percentage (MP) were measured. All complications were recorded. RESULTS: All radiographic measurements were significantly improved at the final follow-up. Positive correlations were found between NSA, MP, and AI. Multiple regression analysis revealed that MP, time from surgery, and age were influenced by the decrease of the NSA. The femoral physis grew off the screw in 9 hips within 36 months. The screw head broke during attempted screw exchange in 1 hip. The remain cases (4 hips) were treated by placing a second screw parallel to the existing one. Finally, progressive subluxation occurred in 3 hips when the physis grew off the screw and were treated by skeletal reconstruction. CONCLUSIONS: TMH-PF was effective in controlling progressive subluxation of the hip in the majority of cases, obviating the need for major reconstructive surgery in these children with CP.

PMID: 28902001

7. Tibial derotational osteotomies in two neuromuscular populations: comparing cerebral palsy with myelomeningocele.

Thompson RM, Ihnow S, Dias L, Swaroop V.

J Child Orthop. 2017 Aug 1;11(4):243-248. doi: 10.1302/1863-2548.11.170037.

PURPOSE: To review the outcomes of tibial derotational osteotomies (TDOs) as a function of complication and revision surgery rates comparing a cohort of children with myelodysplasia to a cohort with cerebral palsy (CP). METHODS: A chart review was completed on TDOs performed in a tertiary referral centre on patients with myelodysplasia or CP between 1985 and 2013 in patients aged > 5 years with > 2 years follow-up. Charts were reviewed for demographics, direction/degree of derotation, complications and need for re-derotation. Two-sample T-tests were used to compare the characteristics of the two groups. Two-tailed chi-square tests were used to compare complications. Generalised linear logit models were used to identify independent risk factors for complication and re-rotation. RESULTS: The 153 patients (217 limbs) were included. Average follow-up was 7.83 years. Overall complication incidence was 10.14%, including removal of hardware for any reason, with a 4.61% major complication incidence (fracture, deep infection, hardware failure). After adjusting for gender and age, the risk of complication was not statistically significantly different between groups ($p = 0.42$) nor was requiring re-derotation ($p = 0.09$). The probability of requiring re-derotation was 31.9% less likely per year increase in age at index surgery ($p = 0.005$). CONCLUSION: With meticulous operative technique, TDO in children with neuromuscular disorders is a safe and effective treatment for tibial torsion, with an acceptable overall and major complication rate. The risk of re-operation decreases significantly in both groups with increasing age. The association between age at initial surgery and need for re-derotation should help guide the treatment of children with tibial torsion.

PMID: 28904628

8. Quantitative assessment of muscular stiffness in children with cerebral palsy using acoustic radiation force impulse (ARFI) ultrasound elastography.

Bilgici MC, Bekci T, Ulus Y, Ozyurek H, Aydin OF, Tomak L, Selcuk MB.

J Med Ultrason (2001). 2017 Sep 12. doi: 10.1007/s10396-017-0824-3. [Epub ahead of print]

PURPOSE: To evaluate the feasibility of quantitative analysis of muscle stiffness in the medial gastrocnemius muscle (GCM) by acoustic radiation force impulse (ARFI) ultrasound elastography in children with spastic cerebral palsy (CP). METHODS: Seventeen children with spastic CP and 25 healthy children participated in the study between the years 2016-2017. The medial GCM in the CP group was assessed using the Modified Ashworth Scale (MAS) by a physiatrist. ARFI was used to measure the shear-wave velocities (SWVs) of the medial GCM. The mean SWV value for each MAS score was calculated and used for statistics. RESULTS: The mean SWV values of the medial GCM in the CP and healthy groups were 3.17 ± 0.81 m/s (mean ± SD) and 1.45 ± 0.25 m/s (mean ± SD), respectively. The SWV of the medial GCM significantly increased in the CP patients when compared with controls ($p < 0.001$). In addition, the SWV values were correlated with the MAS scores ($p < 0.001$). The interobserver agreement expressed as the interclass correlation coefficient was 0.65 (95% CI 0.33-0.84, $p < 0.001$). CONCLUSIONS: ARFI imaging demonstrated a difference in muscle stiffness in the medial GCM between the CP and healthy groups. This method is a feasible imaging modality for the noninvasive assessment of contracting muscles in children with CP.

PMID: 28900767

9. Regional anesthesia for a total knee arthroplasty on an adult patient with spastic diplegia and an intrathecal baclofen pump.

Bojaxhi E, Salek DR, Sherman CE, Greengrass RA.

Rom J Anaesth Intensive Care. 2017 Apr;24(1):69-72. doi: 10.21454/rjaic.7518.241.dip.

We describe the clinical presentation of a patient with spastic diplegia, and its unique perioperative challenges. Opioids and antispasmodic medications are the primary therapy for managing pain and spasticity in the perioperative setting. However, such combination results in several side-effects and their sedative properties are synergistic. A 64-year-old woman with a history of spastic diplegia and an intrathecal baclofen pump for the treatment of her lower extremity spasticity was scheduled for a third elective left knee arthroplasty. She requested a regional anesthetic for the anticipated surgery and an opioid sparing postoperative analgesic regiment. We describe the successful use of a lumbar plexus and a sciatic nerve block as the primary anesthetic for the surgery and the use of a continuous lumbar plexus catheter for the postoperative course. Based on our patient's past anesthetic history, a regional anesthetic/analgesic technique is the ideal strategy in controlling perioperative pain and spasticity.

PMID: 28913502

10. Reliability of patellar height indices in children with cerebral palsy and spina bifida.

Rethlefsen SA, Barrett KK, Wren TAL, Blumstein G, Gargiulo D, Ryan DD, Kay RM.

J Child Orthop. 2017 Aug 1;11(4):249-255. doi: 10.1302/1863-2548.11.170014.

BACKGROUND: The Koshino (KI) and Caton-Deschamps (CDI) indices are used to measure patellar height in children, with the CDI showing excellent reliability in typically developing (TD) children. Reliability of such measures in children with cerebral palsy (CP) and spina bifida (SB) is unknown. METHODS: Lateral knee radiographs were reviewed retrospectively for children with TD (n = 49), CP (n = 48) and SB (n = 42). Five raters took measurements from radiographs twice, at least two weeks apart. Measurements included the CDI, Insall-Salvati Index (ISI) and KI. Systematic variability (bias) and random variability were examined using repeated measures ANOVA, 95% limits of agreement (LOA) and coefficients of variation (CV). RESULTS: Mean values of all three indices differed among raters ($p < 0.0001$). A significant difference was seen between the first and second measurements for CDI and KI indicating a learning effect. LOA ranges were large for the CDI (intra-rater: 0.37-0.95, inter-rater: 0.60-1.04) and ISI (intra-rater: 0.25-0.49, inter-rater: 0.51-0.57) for all patient groups. The KI showed a clinically acceptable range for TD participants (intra-rater: 0.14-0.16, inter-rater: 0.11-0.14) with larger ranges for CP (intra-rater: 0.26-0.33, inter-rater 0.0.2-0.35) and SB patients (intra-rater: 0.23-0.27, inter-rater: 0.19-0.25). CVs were lowest (best) for KI (3.8% to 7.4%) and highest (worst) for CDI (14.7% to 23.1%) for all three groups. Results were similar for

patients with both open and closed physes. CONCLUSIONS: The KI is the most reliable patellar height measure for paediatric patients with TD, CP and SB, with either open or closed physes. The KI is more complex and experience may be important for valid, reliable measurement.

PMID: 28904629

11. Safety and Efficacy of Repeat Open-Label AbobotulinumtoxinA Treatment in Pediatric Cerebral Palsy.

Delgado MR, Bonikowski M, Carranza J, Dabrowski E, Matthews D, Russman B, Tilton A, Velez JC, Grandoulier AS, Picaut P.

J Child Neurol. 2017 Jan 1:883073817729918. doi: 10.1177/0883073817729918. [Epub ahead of print]
This was a prospective, repeat-treatment, open-label study (NCT01251380) of abobotulinumtoxinA for the management of lower limb spasticity in children who had completed a double-blind study. Children (2-17 years) received injections into the gastrocnemius-soleus complex, and other distal and proximal muscles as required (maximum total dose per injection cycle: 30 U/kg or 1000U). A total of 216 of the 241 double-blind patients entered the extension study and 207 received ≥1 open label injection into the gastrocnemius-soleus; 17-24% of patients also had injections into the hamstrings. The most frequent adverse events were related to common childhood infections and the most frequent treatment-related adverse event was injection site pain (n = 10). There was no evidence of a cumulative effect on adverse events. Sustained significant clinical improvements in muscle tone (Modified Ashworth Scale), spasticity (Tardieu Scale), overall clinical benefit (Physicians Global Assessment), and goal attainment (Goal Attainment Scale) were also observed across treatment cycles.

PMID: 28914131

12. Contribution of sensory feedback to plantar flexor muscle activation during push-off in adults with cerebral palsy.

Frisk RF, Jensen P, Kirk H, Bouyer LJ, Lorentzen J, Nielsen JB.

Neurophysiol. 2017 Sep 13:jn.00508.2017. doi: 10.1152/jn.00508.2017. [Epub ahead of print]

INTRODUCTION: Exaggerated sensory activity has been assumed to contribute to functional impairment following lesion of the central motor pathway. However, recent studies have suggested that sensory contribution to muscle activity during gait is reduced in stroke patients and children with cerebral palsy (CP). We investigated whether this also occurs in CP adults and whether daily treadmill training is accompanied by alterations in sensory contribution to muscle activity. MATERIALS AND METHODS: 17 CP adults and 12 uninjured individuals participated. The participants walked on a treadmill while a robotized ankle-foot orthosis applied unload perturbations at the ankle hereby removing sensory feedback naturally activated during push -off. Reduction of electromyographic (EMG) activity in the soleus muscle caused by unloads was compared and related to kinematics and ankle joint stiffness measurements. Similar measures were obtained after 6 weeks of gait training. RESULTS: Sensory contribution to soleus EMG activation was reduced in CP adults compared with uninjured adults. The lowest contribution of sensory feedback was found in participants with lowest maximal gait speed. This was related to increased ankle plantar flexor stiffness. 6 weeks of gait training did not alter the contribution of sensory feedback. CONCLUSION: Exaggerated sensory activity is unlikely to contribute to impaired gait in CP adults, since sensory contribution to muscle activity during gait was reduced compared with uninjured individuals. Increased passive stiffness around the ankle joint is likely to diminish sensory feedback during gait so that a larger part of plantar flexor muscle activity must be generated by descending motor commands.

PMID: 28904105

13. Medical treatment of dyskinetic cerebral palsy: translation into practice.

Termsarasab P.

Dev Med Child Neurol. 2017 Sep 11. doi: 10.1111/dmcn.13549. [Epub ahead of print]

[No abstract available]

PMID: 28892137

14. Identification and measurement of dystonia in cerebral palsy.

Supiot F.

Dev Med Child Neurol. 2017 Sep 11. doi: 10.1111/dmcn.13543. [Epub ahead of print]

[No abstract available]

PMID: 28892136

15. Dopa-responsive Dystonia in a Child Misdiagnosed as Cerebral Palsy.

Kulshreshtha D, Maurya PK, Singh AK, Thacker AK.

J Pediatr Neurosci. 2017 Apr-Jun;12(2):172-173. doi: 10.4103/jpn.JPN_123_16.

Dopa-responsive dystonia also known as "Segawa's syndrome" was first described in 1976. The dystonia typically shows diurnal variations and is more marked toward the end of the day and improves in sleep. This entity is often misdiagnosed in the clinical setting, mostly due to the lack of awareness, and these patients are exposed to various treatment regimens and nonpharmacological measures. We present a boy being treated as dystonic cerebral palsy who showed significant improvement in dystonic symptoms with L-dopa therapy.

PMID: 28904579

16. Severity of motor dysfunction in children with cerebral palsy seen in Enugu, Nigeria.

Ogoke CC, Iloeje SO.

Pan Afr Med J. 2017 Jun 30;27:154. doi: 10.11604/pamj.2017.27.154.11474. eCollection 2017.

INTRODUCTION: Children with cerebral palsy (CP) have gross motor dysfunction (GMD) of varying degrees of severity. The Gross Motor Function Classification System (GMFCS) is widely used internationally to classify children with CP into functional severity levels. There are few reports on the use of GMFCS in Nigeria to determine the severity of motor dysfunction in children with CP. This study aims to classify children with CP in Enugu on the basis of severity of their GMD in order to ascertain their management needs. METHODS: The study was a cross sectional observational study and sample selection was by consecutive recruitment. One hundred (100) children with CP aged 9 - 96 months, attending two Pediatric Neurology Clinics in Enugu, were consecutively recruited. Relevant history was taken including modalities of treatment received. Neurological examination was done and the GMFCS manual was used to classify the children into levels of severity. RESULTS: GMD varied in severity in the patients from mild (47%) (GMFCS levels I & II) to moderate (7%) (GMFCS levels III) and to severe (46%) (GMFCS levels IV & V). Those in levels I - III (54%) were ambulatory while those in levels IV & V (46%) were non-ambulatory. Of the 53 that required mobility assistive device, only 6 (11.3%) were using one. CONCLUSION: More than half of CP patients seen in Enugu were ambulatory with mild to moderate motor dysfunction based on the GMFCS. Only a few of our patients are appropriately rehabilitated with augmentative interventions.

PMID: 28904682

17. Do research papers provide enough information on design and material used in ankle foot orthoses for children with cerebral palsy? A systematic review.

Eddison N, Mulholland M, Chockalingam N.

J Child Orthop. 2017 Aug 1;11(4):263-271. doi: 10.1302/1863-2548.11.160256.

OBJECTIVES: The purpose of this article is to determine how many of the current peer-reviewed studies of ankle foot orthoses (AFOs) on children with cerebral palsy (CP) have included adequate details of the design and material of the AFO, to enable the study to be reproduced and outcomes clearly understood. METHODS: A thorough search of studies published in

English was conducted in March 2015, with no restriction on dates, within all major databases using relevant phrases. These searches were then supplemented by tracking all key references from the appropriate articles identified. STUDY SELECTION: The inclusion criteria were as follows: (1) population - children with CP; (2) intervention - AFOs; and (3) outcome measure. One reviewer extracted data regarding the characteristics of the included studies, with the extracted data checked for accuracy and completeness by a second reviewer. None of the studies reviewed gave adequate details of the AFOs. Only 3.6% (n = 2) of papers tested the stiffness. Many studies (54.5%) did not describe the material used nor the material thickness (72.7 %). None of them gave any clinical justification for the chosen design of AFO. CONCLUSIONS: There is a clear paucity of detail regarding the design and material used in AFOs on studies involving children with CP. Such a lack of detail has the potential to affect the validity of the reported outcomes, the ability to reproduce the studies and may misinform clinical practice.

PMID: 28904631

18. The prevalence of mental health disorders and symptoms in children and adolescents with cerebral palsy: a systematic review and meta-analysis.

Downs J, Blackmore AM, Epstein A, Skoss R, Langdon K, Jacoby P, Whitehouse AJO, Leonard H, Rowe PW, Glasson EJ; Cerebral Palsy Mental Health Group.

Dev Med Child Neurol. 2017 Sep 15. doi: 10.1111/dmcn.13555. [Epub ahead of print]

AIM: Mental health conditions and problems are often reported in children and adolescents with cerebral palsy (CP). A systematic review was undertaken to describe their prevalence. METHOD: MEDLINE and PsycINFO databases from 1996 to 2016 were searched and reference lists of selected studies were reviewed. Studies were included if they reported point prevalence of mental health diagnoses or symptoms in a general population of children and/or adolescents with CP. Pooled prevalence for mental health symptoms was determined using a random effects meta-analysis. RESULTS: Of the 3158 studies identified, eight met the inclusion criteria. Mental health disorders were diagnosed by psychiatric interview in one study, giving a prevalence of 57% (32 out of 56 children). The remaining seven studies (n=1715 children) used parent-report mental health screening tools. The pooled prevalence for mental health symptoms using the Strengths and Difficulties Questionnaire (n=5 studies) was 35% (95% confidence interval [CI] 20-61) and using the Child Behavior Checklist (n=2 studies) was 28% (95% CI 22-36). Evidence was characterized by a moderate level of bias. INTERPRETATION: More studies are needed to ascertain the prevalence of mental health disorders. Mental health symptoms are common and mental health evaluations should be incorporated into multidisciplinary assessments for these children.

PMID: 28914445

19. [Morbimortality associated to nutritional status and feeding path in children with cerebral palsy].

[Article in Spanish]

Figueroa MJ, Rojas C, Barja S.

Rev Chil Pediatr. 2017;88(4):478-486. doi: 10.4067/S0370-41062017000400006.

INTRODUCTION: Children and adolescents with cerebral palsy (CP) have a high prevalence of malnutrition associated to poor prognosis. For an adequate nutritional assessment, new growth curves (Brooks, 2011) are available, in which precise cut-off points in Weight/Age index correlate to increased morbidity and mortality rate. OBJECTIVE: To evaluate risk of hospitalization and death in patients with CP, according to nutritional risk (NR). PATIENTS AND METHOD: Observational and prospective cohort study of patients with CP in an outpatient referral center. We registered demographic, socioeconomic data and nutritional assessment. During a one-year follow-up, hospitalizations and mortality were recorded. The correspondent committee extended an ethical approval. RESULTS: 81 CP patients were recruit, age 131.6 ± 60.4 months (25-313), 60 % male, 77.5 % without independent mobility. The 23 NR patients (28.4%) had lower muscle and fat mass (p = 0.000). During the follow-up, 29/81 patients required hospitalization (35.8%) and 4/81 died (4.9%). There was not an increased risk of hospitalization and/or mortality in NR group, but both were significantly higher in gastrostomy-fed children (RR: 2,98 CI 95%: 1.32-6.75 combining both variables). CONCLUSIONS: In this study, children and adolescents with severe CP and nutritional risk had similar morbidity and mortality during a one-year follow-up, compared to those with acceptable nutritional status. Both risks were higher in gastrostomy-fed than the orally fed children.

PMID: 28898315

20. Do children grow into cerebral palsy?

Von Hofsten C.

Dev Med Child Neurol. 2017 Sep 15. doi: 10.1111/dmcn.13551. [Epub ahead of print]

[No abstract available]

PMID: 28914441

21. Protocol for a systematic review of instruments for the assessment of quality of life and well-being in children and adolescents with cerebral palsy.

Mpundu-Kaambwa C, Chen G, Huynh E, Russo R, Ratcliffe J.

BMJ Open. 2017 Sep 11;7(9):e015924. doi: 10.1136/bmjopen-2017-015924.

INTRODUCTION: Cerebral palsy is the most common cause of physical disability in children and adolescents and is associated with impairments that may reduce the quality of life (QOL) of this population. Patient-reported outcome measures (PROMs) can facilitate the assessment of the effect of disease and treatment on QOL, from a patient viewpoint. The purpose of this systematic review is to identify PROMs that are used to measure QOL and subjective well-being (SWB) outcomes in young people with cerebral palsy and to evaluate the suitability of these PROMs for application in economic evaluations within this population. METHODS AND ANALYSIS: MEDLINE, Scopus, the Cochrane Library, Web of Science Core Collection, EconLit, PsycINFO, CINAHL, EMBASE and Informit will be systematically searched from inception to date of search. Published peer-reviewed, English-language articles reporting PROMs measuring QOL or SWB outcomes in children and adolescents with cerebral palsy will be included. One reviewer will conduct the initial search and screen titles and abstracts for potentially eligible studies. The search will be performed in November 2017. To reduce the likelihood of reviewer selection bias, two other reviewers will independently screen a randomly selected subsample (10%) of the citations. Two reviewers will then retrieve full texts of potentially eligible studies and assess them against predefined inclusion criteria. The suitability of selected PROMs for use in economic evaluations of young people with cerebral palsy will be assessed using the International Society of Quality of Life Research recommended Minimum Standards and the Patient-Centered Outcomes and Comparative Effectiveness Research checklist. A narrative synthesis of extracted data will be presented including study descriptive data, PROMs measurement properties, settings in which they were applied and the valuation methods. Recommendations for practice on the selection of PROMs for use in economic evaluations of children and adolescents with cerebral palsy will be presented. ETHICS AND DISSEMINATION: Ethical approval is not required as the proposed systematic review will not use primary data. The results of this study will be widely disseminated through publication in a peer-reviewed journal and conference presentation(s). SYSTEMATIC REVIEW REGISTRATION NUMBER: International Prospective Register of Systematic Reviews number: CRD42016049746.

PMID: 28899888

Prevention and Cure

22. [Advances in genetic research of cerebral palsy].

[Article in Chinese]

Wang FF, Luo R, Qu Y, Mu DZ.

Zhongguo Dang Dai Er Ke Za Zhi. 2017 Sep;19(9):1022-1026.

Cerebral palsy is a group of syndromes caused by non-progressive brain injury in the fetus or infant and can cause disabilities in childhood. Etiology of cerebral palsy has always been a hot topic for clinical scientists. More and more studies have shown that genetic factors are closely associated with the development of cerebral palsy. With the development and application of various molecular and biological techniques such as chromosome microarray analysis, genome-wide association study, and whole exome sequencing, new achievements have been made in the genetic research of cerebral palsy. Chromosome

abnormalities, copy number variations, susceptibility genes, and single gene mutation associated with the development of cerebral palsy have been identified, which provides new opportunities for the research on the pathogenesis of cerebral palsy. This article reviews the advances in the genetic research on cerebral palsy in recent years.

PMID: 28899476

23. Neurodevelopmental outcome at the age of 4 years according to the planned mode of delivery in term breech presentation: a nationwide, population-based record linkage study.

Macharey G, Väisänen-Tommiska M, Gissler M, Ulander VM, Rahkonen L, Nuutila M, Heinonen S.

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PURPOSE: To evaluate whether a trial of planned vaginal breech labor affects neurologic development in children. METHODS: This is a nationwide, Finnish, population-based record linkage study. An odds ratio with 95% confidence intervals was used to estimate the relative risk that a child delivered by planned vaginal breech labor would be diagnosed with adverse neurodevelopmental outcome (cerebral palsy, epilepsy, intellectual disability, sensor neural developmental outcome, hyperactivity, speech and language problems) at the age of 4 years. The reference group were children born by planned cesarean section. RESULTS: During a study period of 7 years, 8374 infants were delivered in breech position. Among them, 3907 (46.7%) had an attempted labor and 4467 (53.3%) infants were delivered by planned cesarean section. There were no differences in the neurodevelopmental outcome. In the planned vaginal labor group, 133 (3.4%) children had an abnormal neurodevelopmental outcome at the age of 4 years compared to 142 (3.2%) in the planned cesarean section group. CONCLUSION: The absolute risk of abnormal neurological outcome in breech deliveries at term was low, regardless of planned mode of birth. Planned vaginal breech labor did not increase the risk for abnormal neurological outcome compared to planned cesarean section.

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