Cerebral palsy research news

Monday 12 September 2022

Cerebral Palsy Alliance is delighted to bring you this free weekly bulletin of the latest published research into cerebral palsy. Our organisation is committed to supporting cerebral palsy research worldwide - through information, education, collaboration and funding. Find out more at cerebralpalsy.org.au/our-research

Professor Nadia Badawi AM
CP Alliance Chair of Cerebral Palsy Research

Subscribe to CP Research News

Interventions and Management

1. 'Wanting No Regrets': Parental decision making around Selective Dorsal Rhizotomy
Gillian Waite, Deepti Chugh, Stephanie Cawker, Kate Oulton, Jo Wray, Phill Harniess

Child Care Health Dev. 2022 Sep 4. doi: 10.1111/cch.13056. Online ahead of print.

Background: Selective dorsal rhizotomy (SDR) is an irreversible neurosurgical procedure used to reduce spasticity while aiming to improve gross motor function for children with cerebral palsy (CP). Little research has explored the complexity of parental decision-making experiences surrounding SDR surgery and required rehabilitation. The aim was to explore parental experiences and expectation in the decision-making process around the SDR operation, physiotherapy treatment and outcomes. Method: Qualitative methods using in-depth, semi-structured interviews were used. Eighteen parents (11 mothers and 7 fathers) participated whose child had SDR and completed two-year post operative rehabilitation. Data were analysed using thematic analysis. Results: Decision making involved an interacting process between the; 'parental information seeking experience', 'influence of professional encounters and relationships' and 'emotional and social aspects'. Despite underlying uncertainties about outcomes, parental drivers of expectations and aspirations for their child, preceded and sustained this decision-making process. A foundational narrative of 'wanting no regrets' resolved their decision to undertake SDR. Outcomes did not always match expectations and parents moved away from a position of idealism which was driven in part by parental information seeking including overly optimistic media representation. Conclusion: Universally parents expressed they had 'no regrets' on their decision, yet many felt a mismatch between expectation and outcomes of SDR surgery. A greater understanding of the complex nature of SDR decision making is required to help improve family preparedness and provide support from clinicians to enable balanced discussions in parental decision-making.

PMID: 36057954

2. Vertebral body tethering for non-idiopathic scoliosis: initial results from a multicenter retrospective study
Natalie A Pulido, Michael G Vitale, Stefan Parent, Todd A Milbrandt, Firoz Miyanji, Ron El-Hawary, Pediatric Spine Study Group; A Noelle Larson

Spine Deform. 2022 Sep 7. doi: 10.1007/s43390-022-00575-9. Online ahead of print.

Purpose: Vertebral body tethering (VBT) has been described for patients with idiopathic scoliosis. Results of the technique for non-idiopathic scoliosis have not yet been reported. Methods: An international multicenter registry was retrospectively queried for non-idiopathic scoliosis patients who underwent VBT with minimum 2-year follow-up. Success at 2 years was defined as Cobb angle < 35 degrees and no fusion surgery. Results: Of the 251 patients treated with VBT, 20 had non-idiopathic scoliosis and minimum 2-year follow-up. Mean age at surgery was 12.4 years (range 10 to 17 years). Mean major Cobb angle at enrollment was 56 degrees. Of those, 18 patients had a major thoracic curve and two had a major lumbar curve.

Of the 20 patients, nine met criteria for success (45%). Eight of the 20 patients had poor outcomes (four fusions, four with curve > 50 degrees). Success was associated with smaller preoperative Cobb angle (50 vs. 62 degrees, p = 0.01) and smaller Cobb angle on initial postop imaging (28 degrees vs. 46 degrees, p = 0.0007). All patients with Cobb angle < 35 degrees on 1st postop imaging had a successful result, with the exception of one patient who overcorrected and required fusion. Syndromic vs. neuromuscular patients had a higher likelihood of success (5 of 7, 71%, 2 of 10, 20%, p = 0.03). Conclusion: Selected non-idiopathic scoliosis can be successfully treated with VBT, but failure rates are high and were associated with large curves, inadequate intraoperative correction and neuromuscular diagnosis. Achieving a Cobb angle less than 35 degrees on 1st standing radiograph was associated with a successful outcome which was achieved in 45% of patients. Level of evidence: Level IV (retrospective review study).

PMID: 36070136

3. Hip Imaging in Children With Cerebral Palsy: Estimation and Intrapatient Comparison of Patient-Specific Radiation Doses of Low-Dose CT and Radiography
Reyhaneh Nosrati, Da Zhang, Michael J Callahan, Benjamin J Shore, Andy Tsai

Invest Radiol. 2022 Aug 29. doi: 10.1097/RLI.0000000000000920. Online ahead of print.

Objectives: Hip displacement is the second most common orthopedic problem affecting children with cerebral palsy (CP). Routine radiographic hip surveillance typically involves an anteroposterior (AP) pelvis radiograph. Unfortunately, this imaging protocol is limited by its projectional technique and the positioning challenges in children with CP. Alternatively, hip low-dose computed tomography (LDCT) has been advocated as a more accurate strategy for imaging surveillance as it provides biofidelic details of the hip that is independent of patient positioning. However, the tradeoff is the (presumed) higher radiation dose to the patient. The goal of this study is to estimate patient-specific radiation doses of hip LDCTs and AP pelvis radiographs in CP patients, and perform an intrapatient dose comparison. Materials and methods: A search of our imaging database was performed to identify children with CP who underwent hip LDCT and AP pelvis radiograph within 6 months of each other. The LDCTs were performed using weight-adjusted kVp and tube current modulation, whereas the radiographs were obtained with age-/size-adjusted kVp/mAs. The patient-specific organ and effective doses for LDCT were estimated by matching the patients to a nonreference pediatric phantom library from the National Cancer Institute Dosimetry System for Computed Tomography database with Monte Carlo-based dosimetry. The patient-specific organ and effective doses for radiograph were estimated using the National Cancer Institute Dosimetry System for Radiography and Fluoroscopy with Monte Carlo-based dose calculation. Dose conversion k-factors of dose area product for radiography and dose length product for LDCT were adapted, and the estimation results were compared with patient-specific dosimetry. Results: Our study cohort consisted of 70 paired imaging studies from 67 children (age, 9.1 ± 3.3 years). The patient-specific and dose length product-based effective doses for LDCT were 0.42 ± 0.21 mSv and 0.59 ± 0.28 mSv, respectively. The patient-specific and dose area product-based effective doses for radiography were 0.14 ± 0.09 mSv and 0.08 ± 0.06 mSv, respectively. Conclusions: The radiation dose for a hip LDCT is ~4 times higher than pelvis radiograph, but it is still very low and poses minimal risk to the patient.

PMID: 36070536

4. Maintenance of Functional Gains Following a Goal-Directed and FES-Assisted Cycling Program for Children With Cerebral Palsy
Ellen L Armstrong, Roslyn N Boyd, Sean A Horan, Megan J Kentish, Robert S Ware, Christopher P Carty

Pediatr Phys Ther. 2022 Sep 5. doi: 10.1097/PEP.0000000000000942. Online ahead of print.

Purpose: This study investigated whether the functional improvements associated with functional electrical stimulation-assisted cycling, goal-directed training, and adapted cycling in children with cerebral palsy were maintained 8 weeks after the intervention ceased. Methods: The intervention (2 × 1-hour supervised sessions and 1-hour home program/week) ran for 8 weeks. Primary outcomes were the Gross Motor Function Measure (GMFM-88) and the Canadian Occupational Performance Measure (COPM). Secondary outcomes included the GMFM-66 and goal scores, 5 times sit-to-stand test (FTSTS), Participation and Environment Measure-Children and Youth (PEM-CY), Pediatric Evaluation of Disability Inventory Computer Adaptive Test (PEDI-CAT), and cycling power output (PO). Outcomes were assessed at baseline, 8 and 16 weeks.

Results: Twenty children participated (mean age = 10 years 3 months; SD = 2 years 11 months; Gross Motor Function Classification System II = 5, III = 6, and IV = 9). Improvements were retained above baseline at 16 weeks on the GMFM and COPM. Improvements in cycling PO, PEDI-CAT scores, PEM-CY environmental barriers and FTSTS were also retained. Conclusion: Functional improvements in children with cerebral palsy were retained 8 weeks post-intervention.

PMID: 36067381

5. Physiological Response to the 6-Minute Frame Running Test in Children and Adults With Cerebral Palsy
Arnoud M M Edelman Bos, Emma Hjalmarsson, Annet J Dallmeijer, Rodrigo Fernandez-Gonzalo, Annemieke I Buizer, Jessica Pingel, Eva Pontén, Ferdinand von Walden, Petra E M van Schie

Pediatr Phys Ther. 2022 Sep 5. doi: 10.1097/PEP.0000000000000947. Online ahead of print.

Purpose: To determine the physiological response and association to peak oxygen uptake of the 6-minute Frame Running test (6-MFRT) in persons with cerebral palsy (CP). Methods: Twenty-four participants with CP, Gross Motor Function Classification System II/III/IV, performed the 6-MFRT. Distance, peak heart rate (HRpeak), peak respiratory exchange ratio (RERpeak), and peak oxygen uptake (O2peak) were measured. Results: HRpeak ranged from 146 to 201 beats per minute, RERpeak from 0.94 to 1.49, 6-MFRT distance from 179 to 1220 m and O2peak from 0.62 to 2.18 L/min. HRpeak was achieved in 63%, RERpeak in 71%. A strong correlation was observed between 6-MFRT and O2peak. Conclusions: The 6-MFRT represented a (near) maximum effort for 75% of the participants and the 6-MFRT can be used to estimate oxygen consumption on an individual basis.

PMID: 36067377

6. Comment on: Effect of extracorporeal shockwave therapy on muscle spasticity in patients with cerebral palsy: systematic review and meta-analysis
Min C Chang

Eur J Phys Rehabil Med. 2022 Sep 5. doi: 10.23736/S1973-9087.22.07684-5. Online ahead of print.

No abstract available

PMID: 36062332

7. Spasticity-related pain in children/adolescents with cerebral palsy. Part 2 IncobotulinumtoxinA efficacy results from a pooled analysis
Michaela Bonfert, Florian Heinen, Petr Kaňovský, A Sebastian Schroeder, Henry G Chambers, Edward Dabrowski, Thorin L Geister, Angelika Hanschmann, Michael Althaus, Marta Banach, Deborah Gaebler-Spira

J Pediatr Rehabil Med. 2022 Aug 27. doi: 10.3233/PRM-220020. Online ahead of print.

Purpose: This pooled analysis of data from three Phase 3 studies investigated the effects of incobotulinumtoxinA on spasticity-related pain (SRP) in children/adolescents with uni-/bilateral cerebral palsy (CP). Methods: Children/adolescents (ambulant and non-ambulant) were evaluated for SRP on increasingly difficult activities/tasks 4 weeks after each of four incobotulinumtoxinA injection cycles (ICs) using the Questionnaire on Pain caused by Spasticity (QPS; six modules specific to lower limb [LL] or upper limb [UL] spasticity and respondent type [child/adolescent, interviewer, or parent/caregiver]). IncobotulinumtoxinA doses were personalized, with all doses pooled for analysis. Results: QPS key item responses were available from 331 and 155 children/adolescents with LL- and UL-spasticity, respectively, and 841/444 (LL/UL) of their parents/caregivers. IncobotulinumtoxinA efficacy was evident with the first IC. Efficacy was sustained and became more robust with further subsequent ICs. By week 4 of the last (i.e. fourth) IC, 33.8-53.3% of children/adolescents reported complete SRP relief from their baseline pain for respective QPS items. Children/adolescents reported reductions in mean LL SRP intensity at levels that

surpassed clinically meaningful thresholds. Similarly, parents/caregivers observed complete SRP relief and less frequent SRP with incobotulinumtoxinA. Similar results were found for UL SRP. Conclusion: These findings indicate that incobotulinumtoxinA could bring considerable benefit to children/adolescents with spasticity by reducing SRP, even during strenuous activities.

PMID: 36057802

8. Effects of Transcranial Magnetic Stimulation Combined with Computer-Aided Cognitive Training on Cognitive Function of Children with Cerebral Palsy and Dysgnosia
Jun Chen, Xiaoming Yu, Guangjin Luo

Comput Math Methods Med. 2022 Aug 26;2022:5316992. doi: 10.1155/2022/5316992. eCollection 2022.

Objective: This study is aimed at researching transcranial magnetic stimulation (TMS) effects combined with computer-aided cognitive training (CACT) on cognitive function of children suffering from cerebral palsy and dysgnosia. Methods: From December 2019 to October 2021, 86 children with cerebral palsy and dysgnosia who were treated at our hospital were recruited and assigned into observation and control groups (n = 43, each) using the random number table technique. The observation group received TMS combined with CACT (TMS+CACT), whereas the control group received only TMS. Chinese Wechsler Young Children Scale of Intelligence (C-WYCSI) and Chinese-Wechsler Intelligence Scale for Children (C-WISC) were used to evaluate the intelligence level of the two groups; Gross Motor Function Measure-88 (GMFM-88) of Fudan Chinese version was employed for evaluating the gross motor function of the two groups; a comparison was drawn among the two groups for the cerebral hemodynamic parameters before and after the treatment. Results: For young children, the verbal intelligence quotient (VIQ) scores at 6 and 12 weeks of treatment in the observation group were increased when compared to those in the control group (48.91 ± 3.70 vs. 47.32 ± 3.33, 54.25 ± 4.46 vs. 49.48 ± 3.36), and the observation group's performance intelligence quotient (PIQ) score at 12 weeks of treatment was higher as to that of the control group (65.38 ± 4.23 vs. 62.81 ± 4.74, all $P < 0.05$). For older age children, the observation group's VIQ and PIQ scores were greater than the control group's at 6 and 12 weeks of treatment, with statistical significance (63.80 ± 3.76 vs. 59.50 ± 5.32, 74.64 ± 12.04 vs. 65.08 ± 6.30; 63.91 ± 5.96 vs. 58.42 ± 3.70, 72.73 ± 5.06 vs. 66.42 ± 5.93; all $P < 0.05$). The GMFM-88 scale scores in both groups were increased after 6 and 12 weeks of treatment. After treatment for 12 weeks, the observation group's A-E scores were greater than those of the control group (all $P < 0.05$). The peak systolic velocity (V s), end-diastolic velocity (V d), and mean velocity (V m) at the anterior cerebral artery (ACA), middle cerebral artery (MCA), and posterior cerebral artery (PCA) in the observation group were dramatically increased than those in the control group (all $P < 0.05$) after 12 weeks of treatment. Conclusion: TMS+CACT can effectively improve the intelligence level, cognitive ability, gross motor function, and cerebral blood flow of children suffering from cerebral palsy and intellectual disability.

PMID: 36060668

9. Hip subluxation in Italian cerebral palsy children and its determinants: a retrospective cohort study
Silvia Faccioli, Silvia Sassi, Adriano Ferrari, Elena Corradini, Francesca Toni, Shaniko Kaleci, Francesco Lombardi, Maria Grazia Benedetti

Int J Rehabil Res. 2022 Sep 5. doi: 10.1097/MRR.0000000000000545. Online ahead of print.

The study's aim was two-fold: to describe the trend of hip subluxation in the largest sample of Italian nonambulatory cerebral palsy (CP) children ever published; to investigate its determinants. This single-centre retrospective cohort study included patients with spastic or dyskinetic CP, Gross Motor Function Classification System (GMFCS) level IV or V, age 0-18 years, having been referred to our unit before March 2020. The hip subluxation was measured by means of the migration percentage (MP). Other data were gathered such as sex, CP subtype, GMFCS level, presence of drug-resistant epilepsy, age, use of walkers with weight relief or standing devices, previous botulinum injection or hip surgery, oral or intrathecal baclofen and hip pain. Multiple linear stepwise regression was performed and descriptive statistics are provided. Spastic CP had MP maximum increase in early ages, with GMFCS level V values persistently higher than level IV. The dyskinetic subtype showed a slower increase of the MP, with GMFCS level IV presenting similar or higher values, compared to level V. Age, CP severity and spastic subtype are the main determinants. The stepwise multiple regression analysis demonstrated that weight relief walking and standing assistive devices, combined with botulinum contributed to reduce the MP progression. Dyskinetic CP showed overall lower MP values and a more variable behaviour relative to age and GMFCS level, compared to the spastic subtype. Standing and walking assistive devices, with partial or total weight relief, combined with individually targeted botulinum

injections, should be considered in the management of bilateral nonambulatory CP patients, to prevent hip subluxation or its recurrence after surgery.

PMID: 36059222

10. Family Caregivers' Experiences of Caring for Children With Cerebral Palsy in China: A Qualitative Descriptive Study
Zhi Hong Ni, Sheng Ding, Jin Hua Wu, Shuo Zhang, Chun Yan Liu

Inquiry. 2022 Jan-Dec;59:469580221121510. doi: 10.1177/00469580221121510.

This study aimed to investigate family caregivers' experiences of caring for children with cerebral palsy in China. This study used a descriptive qualitative design. We selected 18 family caregivers from 3 children's hospitals in Jiangsu Province, China, using a purposive sampling method. The following 5 themes emerged as needs of family caregivers' experiences of caring for children with cerebral palsy: overall responsibility, being alone, exhaustion from caring, being a prisoner of life, and uncertainty regarding the future. The findings of our research contribute to a better understanding of the life situation of family caregivers of children with cerebral palsy as we identify the difficulties they experience as well as their specific needs.

PMID: 36062607

11. Unmet healthcare needs in adults with childhood-onset neurodisabilities: a protocol for a systematic review
Elaine Meehan, Aoife L Gallagher, Jennifer Ryan, Claire Kerr, Rory O' Sullivan, Rose Galvin, Manjula Manikanda, Andrew Wormald, Katie Robinson

HRB Open Res. 2021 Sep 28;4:107. doi: 10.12688/hrbopenres.13309.1. eCollection 2021.

Background Many adults with childhood-onset neurodisabilities, such as those with intellectual disability or cerebral palsy, report difficulties accessing the healthcare that they require when they are no longer eligible for paediatric services. Compared to the general population, this population is at greater risk of developing many ageing-related diseases and has higher rates of preventable deaths and premature mortality. Addressing unmet healthcare needs is essential to ensuring equitable access in a quality healthcare system. The aim of this systematic review is to synthesise the current available evidence related to unmet healthcare needs in adults with a range of childhood-onset neurodisabilities. Methods A systematic review of quantitative research studies of adults with a range of diagnoses that fall under the neurodisability umbrella and outcomes related to unmet healthcare needs will be undertaken. The Conducting Systematic Reviews and Meta-Analyses of Observational Studies (COSMOS-E) guidelines will be adhered to. Searches of key databases will be undertaken, and a two-phase screening process carried out by pairs of independent reviewers to select studies that meet the inclusion criteria. Data will be extracted using a purposefully designed form. Risk of bias will be assessed using the Joanna Briggs Institute Critical Appraisal Tools. If it is possible to pool prevalence data, a meta-analysis will be undertaken. Where pooling of data is not possible, a structured synthesis approach will be used, and results will be presented in tables and summarised narratively. Conclusions In recent years, there has been increased emphasis placed on promoting positive ageing and improving the healthcare experiences throughout the lifespan for people with neurodisabilities. Findings of this systematic review can inform decision-making related to healthcare for this vulnerable population and has the potential to contribute to reducing preventable deaths and premature mortality and promoting positive and healthy ageing for this group.

PMID: 36071876

12. What is known about neuroplacentology in fetal growth restriction and in preterm infants: A narrative review of literature
Barbara Gardell, Mattia Dominoni, Annachiara Licia Scatigno, Stefania Cesari, Giacomo Fiandrino, Simona Orcesi, Arsenio Spinillo

Review Front Endocrinol (Lausanne). 2022 Aug 19;13:936171. doi: 10.3389/fendo.2022.936171. eCollection 2022.

The placenta plays a fundamental role during pregnancy for fetal growth and development. A suboptimal placental function may result in severe consequences during the infant's first years of life. In recent years, a new field known as neuroplacentology has emerged and it focuses on the role of the placenta in fetal and neonatal brain development. Because of the limited data, our aim was to provide a narrative review of the most recent knowledge about the relation between placental lesions and fetal and newborn neurological development. Papers published online from 2000 until February 2022 were taken into consideration and particular attention was given to articles in which placental lesions were related to neonatal morbidity and short-term and long-term neurological outcome. Most research regarding the role of placental lesions in neurodevelopment has been conducted on fetal growth restriction and preterm infants. Principal neurological outcomes investigated were periventricular leukomalacia, intraventricular hemorrhages, neonatal encephalopathy and autism spectrum disorder. No consequences in motor development were found. All the considered studies agree about the crucial role played by placenta in fetal and neonatal neurological development and outcome. However, the causal mechanisms remain largely unknown. Knowledge on the pathophysiological mechanisms and on placenta-related risks for neurological problems may provide clues for early interventions aiming to improve neurological outcomes, especially among pediatricians and child psychiatrists.

PMID: 36060976

13. The placenta epigenome-brain axis: placental epigenomic and transcriptomic responses that preprogram cognitive impairment
Anastasia N Freedman, Lauren A Eaves, Julia E Rager, Noemi Gavino-Lopez, Lisa Smeester, Jacqueline Bangma, Hudson P Santos, Robert M Joseph, Karl Ck Kuban, Thomas Michael O'Shea, Rebecca C Fry

Epigenomics. 2022 Sep 8. doi: 10.2217/epi-2022-0061. Online ahead of print.

Aim: The placenta-brain axis reflects a developmental linkage where disrupted placental function is associated with impaired neurodevelopment later in life. Placental gene expression and the expression of epigenetic modifiers such as miRNAs may be tied to these impairments and are understudied. Materials & methods: The expression levels of mRNAs (n = 37,268) and their targeting miRNAs (n = 2083) were assessed within placentas collected from the ELGAN study cohort (n = 386). The ELGAN adolescents were assessed for neurocognitive function at age 10 and the association with placental mRNA/miRNAs was determined. Results: Placental mRNAs related to inflammatory and apoptotic processes are under miRNA control and associated with cognitive impairment at age 10. Conclusion: Findings highlight key placenta epigenome-brain relationships that support the developmental origins of health and disease hypothesis.

PMID: 36073148

14. Making waves: The changing tide of cerebral palsy
Monica S Cooper, Michael C Fahey, Mark T Mackay

J Paediatr Child Health. 2022 Sep 6. doi: 10.1111/jpc.16186. Online ahead of print.

Cerebral palsy (CP) is a broad diagnosis unbound by aetiology and is based on a clinical examination demonstrating abnormalities of movement or posture. CP represents a static neurological condition, provided that neurodegenerative conditions, leukoencephalopathies and neuromuscular disorders are excluded. In paediatrics, the genetic conditions associated with CP are rapidly increasing, with primary and overlapping neurodevelopmental conditions perhaps better categorised by the predominant clinical feature such as CP, intellectual disability, autism spectrum disorder or epilepsy. Progress in molecular genetics may challenge what constitutes CP, but a genetic diagnosis does not negate the CP diagnosis. As clinicians working in the field, we discuss the changing tide of CP. Neuroimaging provides essential information through pattern recognition and demonstration of static brain changes. We present examples of children where a layered clinical diagnosis or dual aetiologies are appropriate. We also present examples of children with genetic causes of CP to highlight the challenges and limitations of neuroimaging to provide an aetiological diagnosis. In consultation with a geneticist, access to genomic testing (exome or genome sequencing) is now available in Australia under Medicare billing for children under the age of 10 with dysmorphic features, one or more major structural organ anomalies, (an evolving) intellectual disability or global developmental delay. We encourage the uptake of genomic testing in CP, because it can be difficult to tell whether a child has an environmental or genetic cause for CP. A specific genetic diagnosis may change patient management, reduce guilt and enable more distinctive research in the future to assist with understanding disease mechanisms.

PMID: 36066306

15. Common data elements and minimum data sets in cerebral palsy: Start small to grow big
Klaus Dieterich

Dev Med Child Neurol. 2022 Sep 4. doi: 10.1111/dmcn.15402. Online ahead of print.

No abstract available

PMID: 36057943

16. The Profile of Epilepsy and its characteristics in Children with Cerebral Palsy
Archana K, Lokesh Saini, Pradeep Kumar Gunasekaran, Paramjeet Singh, Jitendra Kumar Sahu, Naveen Sankhyan, Rajni Sharma, Ankita Bhati, Jaivinder Yadav, Indar Kumar Sharawat

Seizure. 2022 Aug 24;101:190-196. doi: 10.1016/j.seizure.2022.08.009. Online ahead of print.

Purpose: To determine the characteristics of epilepsy in children with Cerebral Palsy (CP) visiting the Pediatric Outpatient Department (OPD) of a tertiary care hospital. Methods: This cross-sectional study was carried out at a tertiary care pediatric hospital. All children with CP aged between 1 and 12 years seen at this hospital during an 18 months period (January 2018 to July 2019) were included. Children with CP who had seizures were studied in detail. Seizure semiologies were classified according to the International League Against Epilepsy (ILAE) 1981 and 2017 classifications. The severity of seizures was assessed with the Early Childhood Epilepsy Severity Scale (E-Chess). Functional impairment was characterised using the Gross Motor Function Classification System (GMFCS) score. Results: Of 300 children with CP, 207 (69%) were male and 93 (31%) female. The mean age was 45.17±31.12 months. Seizures were present in 79 (26%) children. 89.9% of children had drug -responsive epilepsy, and 10.1% had refractory epilepsy. Seizures were present in 30.4% of children with a spastic hemiplegia CP subtype, 28.7% with spastic quadriplegia, 26.3% with spastic diplegia, 24% with mixed type CP, and 6.3% with dyskinetic CP. On E-Chess assessment, the median score was 8 (4-14). The majority had poor Gross Motor Function Classification System (GMFCS) scores (>III). Conclusion: The prevalence of epilepsy in the studied population of children with CP was 26%. The highest incidence of seizures was in the spastic hemiplegia subtype (30.4%). The severity of cortical damage is positively correlated with the risk of having epilepsy. The primary determinant of severity of the GMFCS score was the type of CP and not the presence or absence of epilepsy.

PMID: 36070632

17. Multimorbidity and chronic co-prescription networks and potential interactions in adult patients with epilepsy: MorbiNet study
Ferran Moratalla-Navarro, Victor Moreno, Flora López-Simarro, Maria Estrella Barceló, Alba Aguado

Neurol Sci. 2022 Sep 5. doi: 10.1007/s10072-022-06375-3. Online ahead of print.

We constructed epilepsy multimorbidity networks to study associations with chronic conditions, and co-prescriptions and drug-disease networks to assess potential interactions. We conducted a population-based study in Catalonia, Spain, with electronic files of 3,135,948 adult patients with multimorbidity, 32,625 of them with epilepsy (active diagnosis any time during 2006-2017). We constructed epilepsy comorbidity networks using logistic regression models from odds ratio estimates adjusted by age, sex, and comorbidities with R software and generated trajectories to study the progression of epilepsy. We constructed drug-disease and co-prescription networks using mixed models with repeated measures adjusting by age, sex, and period with chronic prescription invoiced data. Comorbidity more frequently preceding epilepsy included cerebrovascular accident (OR: 3.59), congenital anomalies (2.18), and multiple sclerosis (1.33); and following epilepsy: dementia (1.91), personality disorder (1.59), alcohol abuse (1.22), and Parkinson (1.21). Mental retardation (13.08), neurological cancer (8.49), benign neoplasm (4.69), infections (3.14), and psychosis (1.58) might precede or not epilepsy. A common progression was to schizophrenia, dementia, and other neurological diseases (mainly cerebral palsy and other degenerative diseases of nervous system). Co-prescription associations with major-moderate potential interactions were 54% for carbamazepine, 61% phenytoin, 53% phenobarbital, and 32% valproate. Major potential interactions were with antipsychotic, anxiolytic, opioid, cardiovascular, and other anti-seizure medications (ASMs). The most frequent comorbidities of epilepsy were congenital, cerebrovascular, and neurological and psychiatric conditions. High comorbidity and co-prescription with potential interactions can increase the complexity of care of patients with epilepsy.

PMID: 36063254