Cerebral palsy research news

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Interventions and Management

1.Linking the Mini-Assisting Hand Assessment and the Assisting Hand Assessment in children with unilateral cerebral palsy

Susan Greaves, Marie Holmfur, Rachel Bard-Pondarre, Lena Krumlinde-Sundholm

Dev Med Child Neurol . 2025 Mar 23. doi: 10.1111/dmcn.16311. Online ahead of print.

Aim: To determine the relationship between the Assisting Hand Assessment (AHA), valid for children aged 18 months to 18 years with unilateral cerebral palsy (CP), and the Mini-Assisting Hand Assessment (Mini-AHA), valid for children aged 8 months to 18 months, so results from the two tests can be compared.
Method: This psychometric study used AHA data from 157 children and Mini-AHA data from 86 children. In addition, data from children who had undertaken both the AHA and Mini-AHA assessments within a fixed time frame were sought. A Rasch measurement model analysis was conducted using a concurrent test linking technique when both tests have been undertaken by the same (common) persons.
Results: Data from 23 children who completed both assessments were added to previous AHA and Mini-AHA data. Using the combined data, the common person test linking Rasch analysis showed the AHA and Mini-AHA test results were not equivalent and a conversion table of Mini-AHA units to AHA units was needed.
Interpretation: Information from the conversion table will allow clinicians and researchers to measure changes in use of the affected hand during bimanual performance in children with unilateral CP from 8 months to 18 years.
PMID: 40123052

2.Feedforward control in children with cerebral palsy and association with white matter integrity

Ophélie Martinie, Philippe Karan, Martin Simoneau, Maxime Descoteaux, Catherine Mercier, Maxime T Robert

Front Neurol . 2025 Mar 7:16:1515432. doi: 10.3389/fneur.2025.1515432. eCollection 2025.

Background: Precise upper limb movements required for daily activities rely on feedback and feedforward control mechanisms. In children with cerebral palsy (CP), damage to white matter tracts impairs motor execution and sensorimotor control. Most studies in CP have focused on motor execution deficits, whereas the relationship between feedforward control alterations and white matter microstructure features has received less attention.
Method: This study compared feedforward control during a grasp and lift task in 9 children with CP (diagnosis of hemiplegic CP with mild to moderate upper limb deficits) to 40 typically developing (TD) children aged 8 to 17 years. A secondary objective was to examine associations between feedforward control and the microstructural measures of corticocerebellar and other motor-planning related tracts. All participants completed 13 trials of the grasp and lift task. The CP group also underwent diffusion magnetic resonance imaging (MRI) using a 3-Tesla system to acquire anatomical and diffusion MRI.
Results: Results showed feedforward control deficits in the non-dominant hand of children with CP, reflected by reduced peak force rates before sensory feedback was available and a lack of adaptation across trials. Strong correlations were observed between feedforward control and microstructural measures of the corticospinal tract and superior longitudinal fasciculus, but not with the corticocerebellar tracts.
Conclusion: These findings suggest that broader sensorimotor processes, beyond feedforward control alone, contribute to force control deficits observed in children with CP.
PMID: 40125397

3.Upper limb training for young children with unilateral cerebral palsy using video coaching: An explorative retrospective clinical study

Anke P M Verhaegh, Steven Teerenstra, Maria W G Nijhuis-van der Sanden, Pauline B M Aarts, Michèl A A P Willemsen, Brenda E Groen

Aust Occup Ther J . 2025 Apr;72(2):e70008. doi: 10.1111/1440-1630.70008.

Introduction: Young children with unilateral cerebral palsy (CP) received a home-based training program using video coaching for parents. The primary aim of our study was to evaluate the effectiveness of unilateral training on the use of the affected arm and hand during bimanual activities and to explore factors that affect treatment response. Secondary, we evaluated whether effects were retained after an 8-week break, and if data were available, we explored the effects of a second uni- or bimanual training block. Furthermore, adherence was evaluated.
Methods: Explorative retrospective clinical study evaluating the effectiveness of the first 8-week training block on the (Mini-) Assisting Hand Assessment ((Mini-) AHA) unit score in 81 children aged 8-36 months. Pre- and post-intervention (T0-T1) and 8-week follow-up measurements (T2) were evaluated, and factors influencing treatment response were explored, using linear mixed models (LMM). Additionally, effects of a second training block were explored in 31 of the original 81 children, contingent upon data availability, with T3-T4 measurements included. Adherence, measured as percentage of treatment duration, was explored.
Results: Mini-AHA and AHA unit scores significantly improved between T0 and T1, but did not change between T1 and T2. In children aged 18 months and older, baseline AHA scores were related to change scores. In children aged <18 months, no predictors of treatment response were identified. LMM showed significant improvement between T1-T3 and T1-T4 in Mini-AHA scores in children with a second training block. Adherence rates were 85% in the first and 81% in the second block.
Conclusions: Our data suggest that upper limb training using video coaching can improve hand use in infants and toddlers with unilateral CP, with retained effects after an 8-week break and further enhancement following a second training block. Individual results differed, and controlled studies are needed to strengthen the evidence. High adherence rates suggest the program's feasibility.
Consumer and community involvement statement: There was no direct consumer and community involvement in the study design.
Plain language summary: Cerebral palsy is caused by a brain injury around birth and is the most common physical disability in children, affecting their movement. Children with one side of the body affected often use that side less, making daily activities harder. Training the affected arm in the first 2 years of life is important because the brain is still very adaptable. In our study, we evaluated a home-based training program for young children with cerebral palsy, with blocks of 8 weeks of therapy using video coaching for parents. We looked at how well the first training block improved the use of the affected arm and hand. We also looked at whether the effects lasted after an 8-week break and whether a second training block further improved hand use. Lastly, we looked at how well families continued to train. We found an improvement of the use of the affected hand after the first training block. Children older than 18 months with poorer hand use at the start made more progress, while especially children younger than 18 months demonstrated further improvement after the second training block. Most parents and children were able to continue the training program using video coaching. Early upper limb home-based training with video coaching can help young children with cerebral palsy to improve the use of their affected arm and hand. Video coaching seems effective

to motivate parents to continue with the program. Individual results varied. There is a need for larger studies.
PMID: 40129151

4.A Novel Method to Study Hip Growth and Development in Children with Cerebral Palsy

Luiz Carlos Almeida da Silva, Yusuke Hori, Burak Kaymaz, Jason J Howard, Arianna Trionfo, Michael Wade Shrader, Freeman Miller

Children (Basel) . 2025 Mar 15;12(3):367. doi: 10.3390/children12030367.

Background: Knowledge of the relative contributions to different growth areas in the proximal femur and acetabulum is limited due to the complex anatomy and lack of growth markers in children. There is increasing interest in using guided growth to improve hip joint stability and decrease dysplasia in children with neurological disability. Some children with cerebral palsy (CP) are treated with bisphosphonates for bone insufficiency, which leaves a dense growth arrest band in the bone at the time of treatment. The aim of this study was to develop a novel approach to understand the growth and maturation impact on hip development in children with CP using this growth arrest band.
Methods: Pelvic radiographs of children with CP Gross Motor Function Classification System (GMFCS) level IV/V treated with bisphosphonate were analyzed. We measured neck-shaft angle (NSA), head-shaft angle (HSA), and migration percentage (MP) based on pamidronate bands (PamMP), NSA based on pamidronate bands (PamNSA), and HSA based on pamidronate bands (PamHSA). These measurements were compared using t-test.
Results: Seven children (two GMFCS IV and five GMFCS V) were included. The mean age of the radiographic assessment was 11.4 ± 1.3 (range, 8.6-12.5) years, mean MP 22 ± 7% (range, 13-39%), PamMP 33 ± 7% (range, 18-46%), NSA 151 ± 7° (range, 140-161°), PamNSA 153 ± 4° (range, 142-163°), HSA 164 ± 12° (range, 142-175°), and PamHSA 169 ± 8° (range, 154 -175°). MP decreased by 10.5% compared with PamMP ($p < 0.001$). NSA compared with PamNSA ($p = 0.117$) and HSA compared with PamHSA ($p = 0.325$) were not statistically different.
Conclusions: This novel assessment method demonstrates that ossification of the lateral acetabulum and femoral head in children with CP GMFCS IV/V from age 8 to 12 years undergoes a mean decrease of 10% MP. A decrease of 10% MP after proximal femoral-guided growth has been reported as a positive outcome. However, based on the current measurements, this may be due to normal development. HSA and NSA remained unchanged.
PMID: 40150648

5.Can External Neuromodulation Garments Improve Gait and Function in Children With Cerebral Palsy? A Prospective Single-Arm Study

Lindsey Jean Ross Weller, Shelly-Anne Marie Sherwood, Shin Huey Ng, Maheswari Vellaichamy, Asila Alia Noordin, Ling Ying Tan, Arjandas Mahadev, Tong Hong Yeo, Zhi Min Ng

Health Sci Rep . 2025 Mar 23;8(3):e70566. doi: 10.1002/hsr2.70566. eCollection 2025 Mar.

Introduction: The Exopulse Mollii Suit is an external electrical stimulation garment that is designed to reduce spasticity through electrical stimulation of targeted muscles. Our aims were to study the impact of the garment in improving gait and function in children with cerebral palsy (CP).
Methods: Individuals aged 4-18 years with spastic CP, Gross Motor Function Classification System level I-III were included for a prospective single-arm study from January 2021 to January 2022. Participants wore the suit for 4 weeks 60 min a day. Outcome measures taken pre, post and 1-month-post intervention included: 3D gait analysis (gait profile score, gait deviation index and temporo-spatial parameters), gross motor function measure-88 (GMFM-88), EQ-5D-Y, compliance rate, adverse event and satisfaction. Paired t-test was used for data analysis to compare measurement time points.
Results: Twenty children (median age 7 [range: 4-16; interquartile range: 3.1] years, 55% female, 45% male were recruited. Post-intervention results showed there was no improvement in the gait profile but there was an improving trend in temporo-spatial parameters GMFM Domain C crawling and kneeling improved significantly ($p = 0.03$). Improvement in EQ-5D- Y usual activity was significant ($p = 0.04$). Compliance rate was 95% and nil major adverse event was reported. The majority (75%, $n = 15$) of parents and participants perceived overall positive experience.
Conclusion: The positive changes in gait profile and function were no longer significant at 1-month post-intervention. Further studies with a longer intervention period and concurrent strengthening program are required.
Implications for physiotherapy practice: Using the Molli Suit for 60 min a day for 4 weeks, may be useful in improving:(1) Gait cadence in children with CP. (2) Gross motor function in terms of crawling and kneeling in children with CP.
PMID: 40129510

6.Anterior distal femoral hemiepiphysiodesis for knee flexion contracture in paediatric patients with neuromuscular disorders: A systematic review and meta- analysis

Nicholas G Tipping, Ryan J Campbell, Jacqueline N Khuong, David L Mostofi Zadeh Haghighi, Christopher P Carty, Henry Pj Walsh

Review Gait Posture . 2025 Mar 25:119:222-228. doi: 10.1016/j.gaitpost.2025.03.017. Online ahead of print.

Background: This meta-analysis assesses the effectiveness of ADFH in the operative management of knee flexion contracture in children with neuromuscular disorders.
Methods: The study included 218 patients and assessed 340 knees. Patients had a median age of 11 years (age range 4-17 years) at initial evaluation. The mean follow up time was 25 months.
Results: Gait deviation index improved by 8.49 points following ADFH (95 % CI 4.82-12.15, $p < 0.01$). Minimum flexion angle saw an overall improvement of 20.61 degrees (95 % CI 15.8 - 26.04, $p < 0.001$). Knee flexion contracture had an overall improvement of 11.74 degrees across (95 % CI 10.14-13.33, $p < 0.001$). Popliteal angle improved by 15.59 degrees overall following ADFH (95 % CI 7.57-23.60), $p < 0.01$).
Conclusion: Orthopaedic operations are known to improve knee kinematics and clinical examination findings in neuromuscular disorder patients. ADFH is effective in improving passive and dynamic sagittal knee function.
PMID: 40153888

7.Case Report: Monitoring neuromuscular fatigue through jump performance over two seasons in a cerebral palsy sprinter

Diego Antunes, Eduardo Marcel Fernandes Nascimento, Mateus Rossato, Edson Soares da Silva, Ricardo Dantas de Lucas, Gabriela Fischer

Case Reports Front Sports Act Living . 2025 Mar 7:7:1558020. doi: 10.3389/fspor.2025.1558020. eCollection 2025.

Introduction: World Para Athletics classifies athletes with brain injury, cerebral palsy, and motor coordination impairments into Group Class 31 to 38. Para athletes who can run and jump but are affected by impairments such as athetosis, ataxia, and dystonia, which impact all four limbs and the trunk, are categorized as Class T36. Monitoring training load and performance is essential for guiding training programs and preventing injuries in this population. Vertical jumps are commonly used to assess neuromuscular parameters in athletes with cerebral palsy. In this study, we tracked performance changes and monitored vertical jump height and power over two competitive seasons in a sprinter with cerebral palsy.
Case presentation/methods: The sprinter has had cerebral palsy since birth and is classified in the T36 class. Over two competitive seasons, his neuromuscular performance was monitored weekly using vertical jump tests, particularly Countermovement and Squat Jumps. His running performance was assessed through competition results. The parameters measured included Jump height and Peak power (WPEAK), which was calculated as the highest value from the curve obtained by multiplying the ground reaction force by the velocity during the concentric phase of the jump, normalized by body mass. Additionally, his official race times for the 100 m, 200 m, and 400 m events were recorded from January 2017 to October 2018.
Results: The absolute and relative sprint performance values improved significantly between the first and the best official results: 100 m (from 15.05 s to 13.97 s = -7.1%), 200 m (from 31.30 s to 29.05 s = -7.1%); and 400 m (from 71.60 s to 66.24 s = -7.4%). The correlation between vertical jump parameters and sprint performance results was large to very large for the 100 m and 200 m events ($r = 0.55$-0.87).
Discussion: The Para athlete demonstrated improved performance over two seasons and didn't sustain any injuries. These findings suggest that monitoring jump performance is a valuable and practical method for tracking training loads and predicting sprint performance. Further, longitudinal studies are needed to investigate the applicability of vertical jumps as a tool for coaches to monitor training load and performance across athletes with CP from various track classifications and event types.
PMID: 40125315

8.The effect of Kinesio Taping on motor function in children with cerebral palsy: a systematic review and meta-analysis of randomized controlled trials

Xiaoguang Lin, Jiongliang Zhang, Minmin Wu, Jinting Li, Wenjing Song, Luwen Zhu

Front Neurol . 2025 Mar 6:16:1527308. doi: 10.3389/fneur.2025.1527308. eCollection 2025.

Introduction: Kinesio taping (KT) is a well-known rehabilitation therapy technique used for treating children with cerebral palsy. However, no meta-analysis of kinesio taping has been conducted specifically for this purpose. This systematic review and meta-analysis aim to explore the effectiveness of kinesio taping in enhancing gross motor function, balance ability, and gait in children with cerebral palsy.
Methods: A comprehensive database search was conducted using PubMed, Embase, the Cochrane Library, Web of Science, Cnki, Wan Fang, VIP, and the Physiotherapy Evidence Database (PEDro) to identify randomized controlled trials (RCTs) investigating the impact of kinesio taping (KT) on cerebral palsy. RCTs published until May 31, 2024, that met our predetermined inclusion and exclusion criteria were included. Data extraction, literature review, and assessment of the methodological quality of the trials were performed. The meta-analysis was conducted using StataSE version 16.
Results: The primary outcome was Gross Motor Function Measure, Berg Balance Scale, Muscle Tension-Heel-Ear Test. The secondary outcomes were step frequency, step speed, step length. Our meta-analysis includes 378 children from 10 RCTs incorporated. Main result the Gross Motor Function Measure (GMFM D) (SMD = 1.00, 95%CI = 0.24-1.77, p = 0.01, I 2 = 87.3), the Gross Motor Function Measure (GMFM E) (SMD = 0.84, 95%CI = 0.22-1.46, p = 0.008, I 2 = 81.5%), the Berg Balance Scale (BBS) (SMD = 0.81, 95%CI = 0.20-1.42, p = 0.009, I 2 = 76.3%). Muscle Tension-Heel-Ear Test (SMD = 1.57, 95%CI = 0.59-2.55, p = 0.002, I 2 = 79.8%). The children showed significant improvements in gross motor function, balance and muscle tension compared to the results of the control group. The secondary step length (SMD = 0.46, 95% CI = 0.18-0.76, I 2 = 47.3%, p = 0.002) had an improvement effect, but no significant effect on step frequency and step speed.
Conclusion: To some extent, compared to the control group, the addition of kinesio taping improved motor dysfunction in children with cerebral palsy during rehabilitation.
Systematic review registration: https://www.crd.york.ac.uk/PROSPERO/search, identifier: CRD42024528254.
PMID: 40125393

9.The Keep Moving Together Telerehabilitation for Children With Cerebral Palsy: Protocol of a Randomized Trial

Herika de Vargas Ciello, Adriana Neves Dos Santos

Randomized Controlled Trial Pediatr Phys Ther . 2025 Apr 1;37(2):298-306. doi: 10.1097/PEP.0000000000001190. Epub 2025 Mar 26.

Purpose: To compare the keep moving together (KMT) protocol between telerehabilitation (Tele KMT) or face-to-face (Face KMT).
Methods: A randomized controlled clinical trial, including a goal-oriented training program for gross motor function activities for children/adolescents with cerebral palsy. One group will have supervised sessions with a physical therapist through telerehabilitation while the other will have face-to-face sessions. Both groups will receive sessions supervised only by a caregiver 3 times per week, at home. The KMT protocol is for 12 weeks. The primary outcome will be gross motor function using the Gross Motor Function Measure. Secondary outcomes are mobility, goals achieved, participation, caregivers' satisfaction, and adverse events. Impact statement: If effective, the Tele-KMT may be an alternative when face-to-face interventions are not possible.
PMID: 40146898

10.Dual Task Training Interventions and Mobility-Based Outcomes in Children with Cerebral Palsy: A Scoping Review

Meaghan Rubsam, Gay L Girolami, Tanvi Bhatt

Review Phys Occup Ther Pediatr . 2025 Mar 25:1-20. doi: 10.1080/01942638.2025.2477792. Online ahead of print.

Purpose: Children with cerebral palsy (CP) struggle in dual task (DT) situations, where interference may decrease performance when executing two simultaneous tasks. Dual task training (DTT) improves primary motor performance in individuals with typical development and neurological conditions, and emerging research also suggests benefits for DT performance. Its potential in children with CP, however, remains unexplored. This scoping review aims to (1) identify; (2) describe; and (3) synthesize the current evidence for DTT interventions in children with CP, and (4) evaluating its effects on mobility-based impairment, activity, and participation level outcomes.
Methods: Five electronic databases were searched. Studies were included if they were in English, included children with CP, used a motor-motor or motor-cognitive DTT intervention, detailed the intervention, and reported results.
Results: The six studies included 117 children with CP (F: 50, M: 67) and used motor-motor (n = 2) and motor-cognitive (n = 4) DTT paradigms. Training ranged from 480 to 1800 min, and all studies showed improved primary motor task performance.
Conclusion: Despite the study heterogeneity, the results provide early, yet promising, evidence that DTT may enhance primary motor task performance in children with CP. Robust and rigorous research is needed to explore the effects of exercise prescription, training regimens, and optimal dosing on motor and cognitive outcomes.
PMID: 40130285

11.Acupuncture combined with language training for aphasia in children with cerebral palsy: a systematic review with meta-analysis and trial sequential analysis

Shuzhen Liu, Yujiao Li, Jun Chang, Jiangwei Shi, Lan Zhao

Front Neurol. 2025 Mar 12:16:1502023. doi: 10.3389/fneur.2025.1502023. eCollection 2025.

Objective: The aim of this study was to comprehensively evaluate the efficacy of acupuncture combined with language training in the treatment of aphasia in children with cerebral palsy (CP).
Methods: We searched eight electronic databases from their inceptions to July 1, 2024 for randomized controlled trials (RCTs) of acupuncture for aphasia in children with CP. The evaluation of methodological quality for RCTs incorporated in this study adhered to the guidelines provided by the Cochrane risk-of-bias tool (ROB2). The Grading of Recommendations Assessment, Development and Evaluation Approach (GRADE) was used to evaluate the certainty of evidence of each outcome. The heterogeneity of the included literature was tested using Review Manager 5.4 software, while publication bias was estimated using funnel plots and Egger's tests by STATA15.1. A trial sequential analysis (TSA) was performed to test the robustness of the conclusiveness of our results.
Results: In this study, we encompassed a total of 56 randomised controlled trials encompassing 4,683 participants. The majority of these trials were characterized by either a high or uncertain risk of bias, predominantly due to the omission of blinding within their experimental setups. Meta-analysis showed that acupuncture combined with language training was significantly better than language training alone in improving the clinical efficiency (RR: 1.25; 95% CI: 1.21, 1.29; $p < 0.00001$). A subgroup analysis of the different types of acupuncture revealed that acupuncture, electroacupuncture, scalp acupuncture, and auricular point seed-pressing all showed a significant improvement in aphasia in children with CP. Acupuncture combined with language training could significantly improve the adaptive behaviour (MD: 7.46; 95% CI: 3.67, 11.26; $p = 0.0001$), verbal behaviour (MD: 7.79; 95% CI: 5.66, 9.92; $p < 0.00001$), fine motor behaviour (MD: 4.66; 95% CI: 1.28, 8.03; $p = 0.007$), and personal social behaviour (MD: 6.47; 95% CI: 2.38, 10.55; $p = 0.002$); it was also significantly more effective in improving the language comprehension developmental quotient (SMD: 2.02; 95% CI: 1.54, 2.50; $p < 0.00001$), the expressive language development quotient (SMD: 2.40; 95% CI: 1.76, 3.03; $p < 0.00001$), assessment of dysarthria (MD: 0.40; 95% CI: 0.11, 0.69; $p = 0.007$), and oral motor function (SMD: 2.63; 95% CI: 1.36, 3.90; $p < 0.0001$).
Conclusion: Acupuncture combined with language training could be an effective treatment for aphasia in children with CP. Due to low or very low certainty of evidence and high heterogeneity, more rigorous RCTs are needed to verify the effect of acupuncture in the management of CP.
PMID: 40144620

12.Optimizing health through education: The Adaptive Health Education on Activity and Diet (AHEAD) program

Olumide Sokunbi, Kevin Ozment, Kelsey LeFevour, Derek Daniels, Melissa Kolski, Jessica Curran, Rebecca Housh, Lexi Thornton, Christine M Gagnon, Manasi Sheth, Prakash Jayabalan

PM R . 2025 Mar 27. doi: 10.1002/pmrj.13364. Online ahead of print.

Background: Studies have shown that athletes with disabilities (AWDs) are often not provided with injury prevention and health promotion strategies via educational programs.
Objective: To assess the impact of a novel educational interventional workshop on the healthy lifestyle knowledge and implementation in a cohort of AWDs using a community-based participatory research approach. We hypothesized that the Adaptive Health Education on Activity and Diet workshop would increase the participation of AWDs in healthy exercise and diet.
Methods: Participants enrolled in this educational interventional prospective cohort study consisted of AWDs participating in an urban adaptive sports program. The intervention included eight virtual educational sessions regarding nutrition, strength training, cardiovascular exercise, and health optimization taught by a multidisciplinary team. The outcome measures were participation in healthy lifestyle regarding diet and exercise, Patient-Reported Outcomes Measurement Information System (PROMIS)-29, and Godin Exercise scores.
Results: The mean age of the adaptive athletes (n = 26) was 50.1 years (SD 15.4), with 50% male and 50% female. Primary disability diagnoses included spinal cord injury, brain injury, stroke, amputation, and cerebral palsy. The baseline physical function level PROMIS-29 scores had a sustained increase (increase from pre to post to follow-up) after the intervention ($p < .05$). There was a nonsustained increase from pre to post intervention ($p < .05$) in frequency of meal preparation and discussion of diet and exercise with a primary care physician. There was an overall increase in frequency of weight training three or more times a week ($p < .05$).
Discussion: Our findings were consistent with our hypothesis that the workshop would increase participation in healthy diet and exercise. The significant improvements were in frequency of meal prep, weight training, and discussions of diet and exercise with primary care physicians.
Conclusion: Providing healthy lifestyle information through an educational workshop tailored to the community's needs, using a community-based participatory research approach, can improve nutrition and exercise participation of AWDs.
PMID: 40145640

13.Minimally Invasive Mitral Valve Repair in a Patient with Cerebral Palsy and Reduced Mobility: A Case Report

Vincent Dinh, Kenza Rahmouni, Tristan Koran, Vincent Chan

Case Reports Can J Cardiol . 2025 Mar 22:S0828-282X(25)00200-4. doi: 10.1016/j.cjca.2025.03.016. Online ahead of print.

Abstract
Surgical repair remains the gold-standard therapy for degenerative mitral regurgitation (MR) and may be performed via a minimally invasive or sternotomy approach. Although well described, minimally invasive mitral valve repair (MVr) is performed in only a subset of patients with degenerative MR, with a recent prospective randomized study showing no difference in functional outcomes at 12 months compared with sternotomy. However, minimally invasive MVr can be performed safely and may offer superior outcomes compared to repair via sternotomy in selected patients. We present a patient with degenerative MR and cerebral palsy, for whom minimally invasive MVr was an ideal therapy.
PMID: 40127890

14.Stakeholder's perspective on brain-computer interfaces for children and young adults with cerebral palsy

Mariana P Branco, Malinda S W Verberne, Bouke J van Balen, Annike Bekius, Sacha Leinders, Marjolijn Ketelaar, Johanna Geytenbeek, Marieke van Driel-Boerrigter, Marike Willems-Op Het Veld, Kim Rabbie-Baauw, Mariska J Vansteensel

Disabil Rehabil Assist Technol . 2025 Mar 23:1-11. doi: 10.1080/17483107.2025.2481426. Online ahead of print.

Abstract
Communication Brain-Computer Interfaces (cBCIs) are a promising tool for people with motor and speech impairment, in particular for children and young adults with communication impairments, for example due to cerebral palsy (CP). Here we aimed to create a solid basis for the user-centered design of cBCIs for children and young adults with severe CP by investigating the perspectives of their parents/caregivers and health care professionals on communication and cBCIs. We conducted an online survey on 1) current communication problems and usability of used aids, 2) interest in cBCIs, and 3) preference for specific types of cBCIs. A total of 19 parents/caregivers and 36 health care professionals who interacted directly with children and young adults (8-25 years old) with severe CP, corresponding to Gross Motor Function Classification System level IV or V, participated. Both groups of respondents indicated that motor impairment occurred the most frequently and had the greatest impact on communication. The currently used communication aids included mainly no/low-tech aids and high-tech aids. The majority of health care professionals and parents/caregivers reported an interest in cBCIs, with a slight preference for implanted electrodes over non-implanted ones, and no preference for either of the two proposed mental BCI control strategies. Results indicate that cBCIs should be considered for a subpopulation of children and young adults with severe CP, and that in the development of cBCIs for this group both visual stimuli and sensorimotor rhythms, as well as the use of implanted electrodes, should be considered.
Plain language summary
Brain–computer Interfaces can restore communication in children with cerebral palsyParents and care professionals have interest in brain–computer interfacesThey have slight preference for implanted over non-implanted systemsThey have no preference between motor or visual mental strategies.
PMID: 40122080

15.Critically appraised paper: Physiotherapy-led overground gait training using a wearable robot may enhance gross motor function for children and adolescents with cerebral palsy [Synopsis]

Nikki Milne

J Physiother . 2025 Mar 22:S1836-9553(25)00003-7. doi: 10.1016/j.jphys.2025.02.003. Online ahead of print.

No abstract available
PMID: 40122754

16.Visuomotor Integration Assessment Using Immersive Virtual Reality for Children With Cerebral Palsy: A Pilot Study

Minxin Cheng, Alexa Craig, Danielle E Levac

Child Care Health Dev . 2025 May;51(3):e70072. doi: 10.1111/cch.70072.

Background: Visuomotor integration (VMI) impairments are common in children with cerebral palsy (CP) and can impact performance of goal-directed upper-extremity tasks. VMI impairment is clinically assessed using the gold-standard Beery-Buktenica test, whereas research paradigms use computerized assessments incorporating eye and hand movement tracking with touchscreen displays. Immersive virtual reality (VR) may potentially enable more ecologically valid VMI assessments through the inclusion of 3D tasks and visual distractions. However, the potential of immersive VR as a VMI assessment method in children with CP has not been evaluated. The current study aims to investigate how VR can assess VMI impairments in children with CP.
Methods: Twelve children with CP completed the Beery-Buktenica VMI test and performed eye-only, hand-only and eye-hand VMI tasks in touchscreen, visually simple VR and visually complex VR conditions. Eye and hand endpoint accuracy and task completion time quantified VMI performance. We compared performance on each task and in each environment between children with below- versus above-average Beery-VMI scores.
Results: There were no significant relationships between Beery-VMI score and eye-hand task performance in visually simple VR. Compared to the touchscreen task, participants demonstrated significantly reduced eye and hand endpoint accuracy in visually simple VR, with no difference between Beery-VMI groups. Children with below-average Beery-VMI scores decreased eye endpoint accuracy and increased trial completion time in visually complex VR.
Conclusion: Findings from this pilot study do not support immersive VR as a VMI assessment method in children with CP.
PMID: 40148004

17.Primitive reflexes in infants with cerebral palsy due to Congenital Zika Syndrome and its relationship with other motor features

Leticia Serra, Débora Patrícia Rios, Mino Rios, Breno Lima de Almeida, Kelly de Souza Fernandes, Rita Lucena, Isadora Cristina de Siqueira

Front Pediatr. 2025 Mar 7:13:1483959. doi: 10.3389/fped.2025.1483959. eCollection 2025.

Background: The Zika virus outbreak, which occurred from 2015 to 2016 in Brazil, resulted in the birth of neonates with brain malformations arising from Congenital Zika Syndrome (CZS). The characterization of primitive reflexes and their relationships with other motor characteristics, easily clinically detectable by health professionals, can aid in establishing motor prognosis in affected children.
Objective: To describe reflex patterns in children with Cerebral Palsy (CP) due to CZS, and investigate associations with other motor features. Method: Observational cross-sectional study involving infants with CZS aged between 12 and 36 months. Primitive reflexes, protective reaction and markers of motor phenotype were evaluated.
Results: 48 children, median age: 19 months, were enrolled, most (79.2%) presented very severe CP (GMFCS 5), the persistence of more than 5 primitive reflexes (55%) and motor development age between 3 and 6 months (33.3%) (Bayley-III). A reduced ability to acquire motor skills was associated with the total number of persistent reflexes (rho = -0.45, $p < 0.01$). Asymmetrical Tonic Neck Reflex (ATNR) correlated with GMFCS level (rho = 0.49, $p < 0.001$). Lower motor development age was linked to abnormal posturing ($p < 0.001$) and absence of Parachute Reaction ($p < 0.001$).
Conclusion: Infants with CP due to CZS present severe motor abnormalities. Lower motor development age is associated with the persistence of more than 5 primitive reflexes, abnormal posturing and the absence of Parachute Reaction. Parachute Reaction appears to be a prognostic marker of motor impairment severity in CZS-affected infants.
PMID: 40123661

18.Recent trends in National Institutes of Health funding for cerebral palsy lifespan research

No authors listed

Dev Med Child Neurol . 2025 Mar 24. doi: 10.1111/dmcn.16313. Online ahead of print.

No abstract available
PMID: 40126201

19.The Validity and Reliability of the Seated Postural Control Measure in Cerebral Palsy

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Pediatr Phys Ther . 2025 Apr 1;37(2):248-255. doi: 10.1097/PEP.0000000000001180. Epub 2025 Mar 26.

Purpose: To establish the validity and reliability of the Turkish version of the Seated Postural Control Measure (SPCM-TR) in children with cerebral palsy (CP).
Methods: The original version of the Seated Postural Control Measure was translated and culturally adapted according to international guidelines. The participants were 124 children with CP, with a mean age of 8.6 ± 2.6 years. The measures were administered by 2 independent physical therapists twice, 1 week apart. Convergent validity was evaluated with the sitting dimension of the Gross Motor Function Measure (GMFM), whereas construct validity was evaluated with the Gross Motor Function Classification System (GMFCS).
Results and conclusions: Cronbach's alpha values of the alignment and function subscales and total score were 0.83, 0.89, and 0.91, respectively. Correlations between SPCM-TR total scores and GMFCS (-0.92) and GMFM (0.91) scores were very good. The intraclass correlation coefficient was excellent (0.90) for intra-rater and inter-rater reliability. The results indicate that the SPCM-TR is a valid and reliable scale in children with CP.
PMID: 40146896

20.Commentary on "The Validity and Reliability of the Turkish Version of the Seated Postural Control Measure in Children With Cerebral Palsy"

Bishnu Dutta Acharya, Sian A Williams

Pediatr Phys Ther . 2025 Apr 1;37(2):256. doi: 10.1097/PEP.0000000000001193. Epub 2025 Mar 26.

No abstract available
PMID: 40146897

21.Neurodevelopmental outcome of perinatal intracranial haemorrhage in patients born at term: A prospective study

Stephanie Libzon, Shelly I Shiran, Aviva Fattal-Valevski, Nira Schneebaum-Sender, Jonathan Roth, Shlomi Constantini, Gustavo Malinger, Karina Krajden Haratz, Liat Ben Sira, Moran Hausman-Kedem

Dev Med Child Neurol . 2025 Mar 28. doi: 10.1111/dmcn.16310. Online ahead of print.

Aim: To assess the neurological and neurodevelopmental outcome of infants born at term with perinatal intracranial haemorrhage (pICH) and examine the clinical and neuroimaging associations.
Method: A prospective, consecutive, single-center observational study of longitudinally followed children with pICH identified in the fetal or neonatal period (≤28 days of life) between January 2014 and November 2022. Neurodevelopmental outcome was rated using the Pediatric Stroke Outcome Measure (PSOM) and the modified Rankin Scale (mRS).
Results: Sixty-eight infants were included (67.6% diagnosed postnatally and 32.4% diagnosed antenatally). Intraventricular haemorrhage was the most common bleeding type (n = 43, 63.2%) and was more common in infants diagnosed prenatally (p = 0.004). Twenty-nine (42.6%) infants were diagnosed with cerebral palsy and 19.1% with remote epilepsy. PSOM was performed at a median age of 3 years 8 months (range = 1 year-9 years 5 months). According to the PSOM, outcome was normal in 29 (42.6%) infants. Twelve (17.6%) patients had mild impairment, 11 (16.2%) had moderate impairment, and 16 (23.5%) had severe impairment. There was no difference in neurological outcomes between patients diagnosed antenatally or postnatally. Remote epilepsy (p = 0.002), multi-compartment ICH (p = 0.048), vermian hemorrhage (p = 0.048), posthaemorrhagic ventricular dilatation (p = 0.037), thalamic volume loss (p = 0.037), white matter loss (p = 0.048), Wallerian degeneration (p = 0.026), and abnormal myelination in the posterior limb of the internal capsule (p = 0.005), were associated with less favourable PSOM scores. Anterior horn width correlated with PSOM total scores (r = 0.6).
Interpretation: pICH carries a significant risk of long-term adverse neurological outcomes with no difference in neurological outcome between those diagnosed antenatally or postnatally. Epilepsy and neuroradiological markers are associated with unfavourable neurodevelopmental outcomes.
PMID: 40156180

22.Paradoxes in pediatric rehabilitation: building an interdisciplinary, total-child framework to promote effective interventions and life course well-being

Sharon Landesman Ramey, Michael E Msall, Craig T Ramey

Front Pediatr . 2025 Mar 10:13:1540479. doi: 10.3389/fped.2025.1540479. eCollection 2025.

Abstract
In this paper, we identify major paradoxes that have emerged from randomized controlled trials and longitudinal studies of diverse groups of young children with identified disabilities and risk conditions. We concentrate on the first three years of life because these coincide with a period of rapid changes in brain structure and function as well as dramatic expansion of a child's skills in motor, language, social-emotional, and cognitive domains. The paradoxes support a major revision in hypotheses about how effective interventions can alter a child's functioning and life course. The following conclusions derive from the paradoxes: (1) the intertwined biological and environmental influences on a child's well-being contribute more to functional outcomes than do the primary medical diagnoses and biological risks alone; (2) high-intensity, high-cost interventions that are well-timed, wholistic, and multi-domain can be more powerful and economical (i.e., yield higher "returns on investment") than many treatments that initially appear less costly and easier to implement; (3) treatments that are individualized to the child and family, while adhering to evidence-backed treatment protocols, are among the most likely to result in large and long-lasting benefits compared to those that are solely individualized or adherent to a treatment protocol that does not make adjustments for the child; and 4) a clearly presented conceptual theoretical framework about human development can be a remarkably practical and informative tool in maximizing benefits of pediatric rehabilitation. We propose an interdisciplinary "total-child" platform - named the Interdisciplinary Monitoring, Planning, and Caring for the Total-Child - Together (IMPACT2) Developmental Framework - to support forming strong partnerships to facilitate informed clinical and family decision-making as well as the design and conduct of scientific investigations. We encourage others to consider these paradoxes and the IMPACT2 framework to stimulate conversations and promote innovative family and community partnerships to realize greater impact from delivering effective pediatric rehabilitation interventions to all eligible children.
PMID: 40129700

23.Health-Related Quality of Life of Individuals with Physical Disabilities in Childhood

Chris Church, Sana Patil, Stephanie Butler, Freeman Miller, Jose J Salazar-Torres, Nancy Lennon, M Wade Shrader, Maureen Donohoe, Faithe Kalisperis, W G Stuart Mackenzie, Louise Reid Nichols

Children (Basel). 2025 Mar 15;12(3):365. doi: 10.3390/children12030365.

Abstract
Background: The use of patient-reported outcomes is essential to understand and manage health-related quality of life (HRQOL) in youth with lifelong disabilities. This study evaluated HRQOL in youth with physical disorders and examined its relationship with mobility. Methods: We conducted an IRB-approved retrospective study in which we administered the parent-reported Pediatric Outcomes Data Collection Instrument (PODCI) and Gross Motor Function Measure section D (GMFM-D) to ambulatory youth aged 2-18 years with cerebral palsy (CP; Gross Motor Function Classification System II; n = 258), arthrogryposis (n = 138), achondroplasia (n = 102), and Morquio syndrome (n = 52) during clinical visits to a gait lab. The PODCI has two validated versions, child and adolescent, that assess perceptions about mobility, happiness, and pain. Differences in HRQOL between diagnostic groups, between age groups, and compared with non-disabled youth were examined using non-parametric tests. The relationship between GMFM-D and PODCI scores was analyzed with Pearson's correlations. Results: Both age cohorts within all diagnosis groups demonstrated higher pain and lower mobility compared with non-disabled youth ($p < 0.015$). Happiness was lower for both age groups with CP and arthrogryposis, and for the child group with Morquio syndrome compared with non-disabled youth ($p < 0.002$). In diagnostic groups in both age spans, Global Function was higher ($p < 0.0001$) for those with achondroplasia compared with other groups. Despite functional differences, there were no significant differences between diagnostic groups in pain scores ($p > 0.10$). Happiness was lower in the group with CP compared with that with achondroplasia ($p = 0.01$). GMFM-D was related to PODCI mobility scores for all diagnoses ($r = 0.31$ to 0.79, $p < 0.03$) but was not correlated with happiness ($r = -0.16$ to 0.092; $p > 0.14$); GMFM-D and PODCI pain scores were associated only for the child group with achondroplasia ($r = 0.355$; $p < 0.001$). Conclusions: Significant limitations in HRQOL are present in youth with physical disabilities. Pain levels were higher than those of non-disabled youth, but pain was not related to lower motor function. Happiness was not related to gross motor function, suggesting the need to examine other factors when mental health concerns are present in youth with disabilities.
PMID: 40150647

24.Daily-life executive functions and bimanual performance in children with unilateral cerebral palsy

Alexandra Kalkantzi, Lize Kleeren, Dieter Baeyens, Lisa Decraene, Monica Crotti, Katrijn Klingels, Anja Van Campenhout, Geert Verheyden, Els Ortibus, Hilde Feys, Lisa Mailleux

Dev Med Child Neurol . 2025 Mar 28. doi: 10.1111/dmcn.16297. Online ahead of print.

Aim: To explore daily-life reported executive functions and their relation with bimanual performance in children with unilateral cerebral palsy (CP).
Method: In this cross-sectional study of 46 children with unilateral CP (mean age 11 years 10 months, standard deviation 2 years 10 months), executive functions were evaluated using the Behavior Rating Inventory of Executive Function (BRIEF) and bimanual performance with the Assisting Hand Assessment (AHA) and Children's Hand-use Experience Questionnaire (CHEQ). One-sample z-tests were used to compare participants' executive functions with population norms, while taking autism spectrum disorder (ASD, n = 16) as a comorbidity into account. Moreover, we used regression analysis to estimate the effect of manual ability (Manual Ability Classification System levels: I = 25, II = 15, III = 6) and having a comorbid diagnosis of ASD on executive functions ($p < 0.05$, R2). Lastly, non-parametric correlations (rs, $p < 0.05$) were calculated between the BRIEF, CHEQ, and AHA.
Results: In general, executive functions in children with unilateral CP were poorer compared with the normative mean ($p \leq 0.024$). However, when excluding participants with ASD, no difference compared with the normative mean was found. A significant effect of manual ability was found for Inhibition ($p = 0.042$), while ASD effects were found for most of the BRIEF subscales ($p \leq 0.001$). Multiple significant correlations were found between the BRIEF and CHEQ (rs = -0.50 to -0.29), while only the BRIEF subscale Inhibition was significantly correlated with the AHA (rs = -0.35).
Interpretation: A higher number of children with unilateral CP exhibit difficulties in daily-life executive functions, which appear to be mainly co-occurring with ASD. Manual ability was a significant factor of inhibition-related behavioural challenges. Furthermore, there seems to be a relation between impaired executive functions and decreased bimanual performance. The findings emphasize the importance of further research, including performance-based assessments of executive functions in children with unilateral CP.
PMID: 40156156

25.Global burden of chronic non-communicable diseases: Prenatal care and beyond, numerous challenges besiege investigation across the care continuum

Jonathan Castillo, Judy K Thibadeau, Andrea Park, Tim Brei, Heidi Castillo

Editorial J Pediatr Rehabil Med . 2025 Mar 28:18758894251331737. doi: 10.1177/18758894251331737. Online ahead of print.

Abstract
Recently, the National Institutes of Health (NIH) announced possible restructuring of indirect and administrative costs for funded research. Many entities have raised concern about the impacts that such funding restructuring may have on the future progress of biomedical investigation. The NIH has historically played a key role in research on relevant chronic conditions, including spina bifida and cerebral palsy. Such research funds have not only provided occasion for basic science investigational opportunities but also have allowed for enquiry into clinical, social, and environmental factors that impact disability-specific health outcomes, including those present in some of the world's most vulnerable communities. However, the journal's editorial board is nonetheless encouraged to see the growth and change of Journal of Pediatric Rehabilitation Medicine (JPRM), as the journal evolves from a special issue format to a collections format. The collections will serve as ever-growing "homes" for the latest research on childhood-onset physical disabilities and complex care needs, with the added benefit of greater accessibility and improved user interface. Furthermore, as reflected in this issue, JPRM will continue to offer a platform for research in multidisciplinary care of childhood disability throughout the lifespan as we weather the changes of time together as a committed global community of clinicians and investigators.
PMID: 40151874

26.Cognitive and Adaptive Functioning of CTNNB1 Syndrome Patients: A Comparison With Autism Spectrum Disorder and Cerebral Palsy

Mercè Pallarès-Sastre, Imanol Amayra, Rafael Pulido, Caroline E Nunes-Xavier, Sonia Bañuelos, Fabio Cavaliere, Maitane García

J Intellect Disabil Res . 2025 Mar 27. doi: 10.1111/jir.13235. Online ahead of print.

Background: The CTNNB1 syndrome is a neurodevelopmental disorder considered an ultra-rare disease, first discovered in 2012. Given its comorbidity of symptoms with more prevalent diseases, such as ASD or CP, many CTNNB1 syndrome patients had previously received those diagnosis. Therefore, the aim of this study is to establish differences on the cognitive and adaptive functioning of the CTNNB1 syndrome compared with ASD and CP.
Methods: A total of 55 paediatric patients-25 CTNNB1 syndrome, 17 ASD and 13 PC-were assessed with an extensive protocol for neuropsychological domains through in-person assessments and online meetings for the parent-reported questionnaire.
Results: No cognitive differences were found among verbal tasks between groups, even though CTNNB1 syndrome patients obtained significantly lower scores in visuospatial and logical tasks. Regarding adaptive functioning, ASD patients outperformed the CTNNB1 syndrome group in most domains, whereas CP patients did not differ as much, obtaining only lower scores in gross motor ability. Externalizing problems were more prevalent in the CTNNB1 syndrome group compared with the control groups. Also, correlations indicated improvement of cognitive and adaptive functioning over the years for the CTNNB1 syndrome patients.
Conclusions: This is the first study to compare the cognitive and adaptive functioning of CTNNB1 syndrome patients with control diseases and detect significant difference. Although intellectual disability is one of the main manifestations of the CTNNB1 syndrome, patients performed better on verbal cognitive tasks than in visuospatial and logical thinking exercises, while adaptive functioning performances did not differ from control groups.
PMID: 40145647

27.Exploring Media Portrayals of Individuals With Intellectual and Developmental Disabilities

Aesha J John, Jade Presnell, Sabrina Cavazos, Cameron Lewright

Intellect Dev Disabil . 2025 Apr 1;63(2):87-104. doi: 10.1352/1934-9556-63.2.87.

Abstract
Considering past evidence highlighting the role of media portrayal in shaping community attitudes towards people with intellectual and developmental disabilities (IDD), we analyzed depictions of IDD in seven television shows and three movies. Characters with IDD were coded based on categories representing (a) their attributes (demographic, disability-related, and personality), (b) the salience of IDD and character with IDD, (c) treatment by other characters, and (d) quality of life. The majority of the characters were White and male, and persons with IDD played characters with visible disabilities. Characters with IDD were often bullied, but most were portrayed as having a strong support system and a good quality of life. Themes are discussed in the context of implications and methodological limitations.
PMID: 40139229

28.Automatic brain quantification in children with unilateral cerebral palsy

Jaime Simarro, Thibo Billiet, Thanh Vân Phan, Simon Van Eyndhoven, Monica Crotti, Lize Kleeren, Lisa Mailleux, Nofar Ben Itzhak, Diana M Sima, Els Ortibus, Ahmed M Radwan

Front Neurosci. 2025 Mar 10:19:1540480. doi: 10.3389/fnins.2025.1540480. eCollection 2025.

Abstract
Assessing brain damage in children with spastic unilateral cerebral palsy (uCP) is challenging, particularly in clinical settings. In this study, we developed and validated a deep learning-based pipeline to automatically quantify lesion-free brain volumes. Using T1-weighted and FLAIR MRI data from 35 patients (aged 5-15 years), we trained models to segment brain structures and lesions, utilizing an automatic label generation workflow. Validation was performed on 54 children with CP (aged 7-16 years) using quantitative and qualitative metrics, as well as an independent dataset of 36 children with congenital or acquired brain anatomy distortions (aged 1-17 years). Clinical evaluation examined the correlation of lesion-free volumes with visual-based assessments of lesion extent and motor and visual outcomes. The models achieved robust segmentation performance in brains with severe anatomical alterations and heterogeneous lesion appearances, identifying reduced volumes in the affected hemisphere, which correlated with lesion extent ($p < 0.05$). Further, regional lesion-free volumes, especially in subcortical structures such as the thalamus, were linked to motor and visual outcomes ($p < 0.05$). These results support the utility of automated lesion-free volume quantification for exploring brain structure-function relationships in uCP.
PMID: 40129724

29.Neonatal encephalopathy and hypoxic-ischemic encephalopathy: the state of the art

Ela Chakkarapani, Linda S de Vries, Donna M Ferriero, Alistair J Gunn

Review Pediatr Res . 2025 Mar 24. doi: 10.1038/s41390-025-03986-2. Online ahead of print.

Abstract
Neonatal Encephalopathy (NE) remains a major cause of death and long-term severe disabilities, including epilepsy and cerebral palsy in term and near-term infants. The single most common cause is hypoxic-ischemic encephalopathy (HIE). However, there are many other potential causes, including infection, intracranial hemorrhage, stroke, brain malformations, metabolic disorders, and genetic causes. The appropriate management depends on both the specific cause and the stage of evolution of injury. Key tools to expand our understanding of the timing and causes of NE include aEEG, or even better, video EEG monitoring, neuro-imaging including cranial ultrasound and MRI, placental investigations, metabolic, biomarker, and genetic studies. This information is critical to better understand the underlying causes of NE. Therapeutic hypothermia improves outcomes after HIE, but there is still considerable potential to do better. Careful clinical and pre-clinical studies are needed to develop novel therapeutics and to help provide the right treatment at the right time for this high-risk population. IMPACT: Neonatal encephalopathy is complex and multifactorial. This review seeks to expand understanding of the causes, timing, and evolution of encephalopathy in newborns. We highlight key unanswered questions about neonatal encephalopathy.
PMID: 40128590

30.Developments in Pediatric Rehabilitation Over Five Decades

Ritu Majumdar, Ganesh Arun Joshi

Review Indian Pediatr . 2025 Mar;62(3):243-246. doi: 10.1007/s13312-025-00016-6.

Abstract
Pediatric rehabilitation focuses on holistic, multidisciplinary care for children with congenital and developmental impairments. Technological innovations, government initiatives, and early interventions have significantly improved outcomes, enhancing the quality of life and independence of children with disabilities living in India. Significant advances in the field have been attributed to the availability and use of assistive devices, telemedicine, and inclusive policies by the government.
PMID: 40126844

31.The Association Study Between Cytokines and the Risk for Cerebral Palsy

Baotian Wang, Fan Wang, Li Yang, Junhong Jiang, Jiulai Tang, De Wu

Mediators Inflamm . 2025 Mar 16:2025:3742331. doi: 10.1155/mi/3742331. eCollection 2025.

Abstract
Background: Cerebral palsy (CP) is a debilitating condition characterized by abnormal movement or posture beginning early in development. Recent evidence has shown that immunological abnormalities are associated with an increased risk of CP. However, there are no valuable biomarkers for CP diagnosis. Methods: In this case-control study, we recruited 108 children with CP and 52 healthy children as controls. The white blood cell (WBC) counts and the levels of inflammatory markers (interleukin-1β (IL-1β), sIL-2R, interleukin-6 (IL-6), IL-8, IL-10, and tumor necrosis factor-α (TNF-α)), neuron-specific enolase (NSE), immunoglobulin E (IgE), and C3/C4 in the blood were measured and the results were statistically analyzed. Subgroup analyzes based on age, complications, and clinical subtypes were also carried out. Results: Compared with the controls, CP patients had elevated levels of NSE, sIL-2R, and TNF-α. There were no differences in WBC count, IL-1β, IL-6, IL-8, IL-10, IgE, C3, or C4. Subgroup analysis revealed significant differences in the personal-social developmental quotient (DQ) among the different CP subtypes. We found that TNF-α, sIL-2R, gross motor DQ, and adaptive DQ were greater in children with CP without epilepsy (EP) than in those with EP. Correlation analysis revealed positive correlations between TNF-α and sIL-2R, gross motor DQ, fine motor DQ, adaptive DQ, and personal-social DQ; moreover, sIL-2R was positively correlated with TNF-α, gross motor DQ, adaptive DQ, personal-social DQ, and eosinophil (EO) count and negatively correlated with age. NSE and TNF-α were associated with a 1.64-fold and 1.66-fold increased risk of CP, respectively. The peripheral blood NSE and TNF-α levels exhibited good diagnostic value for CP. Moreover, receiver operating characteristic (ROC) curve analysis revealed a significant increase in the area under the curve (AUC) when these indicators were combined. Conclusions: This study revealed significant associations between NSE and TNF-α and CP risk, suggesting that NSE and TNF-α might be useful blood biomarkers for identifying patients at high risk of CP.
PMID: 40124353

Prevention and Cure

32.A 2-Min Cytomegalovirus (CMV) Awareness Video Improves Pregnant Women's Knowledge and Planned Adherence to Hygiene Precautions

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Aust N Z J Obstet Gynaecol . 2025 Mar 25. doi: 10.1111/ajo.70016. Online ahead of print.

Introduction: Congenital cytomegalovirus (cCMV) is a leading infectious cause of life-long neurodevelopmental disabilities, but public awareness of CMV is low. This study evaluated a short educational video on cCMV for its acceptability and impact on pregnant women's knowledge and planned hygiene adherence.
Materials and methods: Participants were pregnant women recruited from an Australian tertiary maternity hospital clinic and social media (May 2023 to May 2024). Participants completed online surveys: before the video (T1), immediately after (T2), and 8 weeks later (T3). Linear mixed effects models assessed changes in knowledge and intended adherence to CMV precautions, adjusting for previous CMV education, and parity.
Results: A total of n = 296 eligible pregnant women were recruited, n = 270 completed the T1 survey and watched the video. Participants (n = 270) had a median age of 33 years (range: 18-43 years), 21% were multiparous and 30% had received previous CMV education. Of the 270 participants who completed the T1 survey and viewed the video, 202 (75%) and 109 (40%) completed surveys at T2 and T3 respectively. Adjusted total mean CMV knowledge scores increased significantly between T1 and T2 (+2.38; $p < 0.001$) and remained higher at T3 (+2.14; $p < 0.001$). Self-reported adherence to hygiene precautions improved from T1 to T2 ($p < 0.001$) and were maintained for four out of five key behaviours at T3. Participants (99%) found the content valuable, and 91% agreed that CMV precautions were "easy" to follow.
Conclusion: A CMV education video is a simple, effective method to improve pregnant women's knowledge and planned adherence to hygiene precautions.
PMID: 40130738