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Interventions and Management

1. Effect of Mirror Therapy on Dexterity and Hand Grasp in Children Aged 9-14 Years with Hemiplegic Cerebral Palsy.

Narimani A, Kalantari M, Dalvand H, Tabatabaee SM.

Iran J Child Neurol. 2019 Fall;13(4):135-142.

OBJECTIVES: Mirror therapy using visual feedback is one of the non-invasive methods along with other commonly used rehabilitation treatments for neurological patients which therapeutic effects on the affected upper limb of children with hemiplegic cerebral palsy have also been studied. We aimed to examine the effect of mirror therapy on improving the dexterity and grasp of children with hemiplegic cerebral palsy. **MATERIALS & METHODS:** In this single-blind clinical trial, 30 children with hemiplegic cerebral palsy in rehabilitation centers and special schools of Tabriz, northwest of Iran were randomly divided into two intervention and control groups in 2017. The children of the intervention group were under mirror therapy for 6 weeks. Occupational therapy exercise was done routinely for both groups. The grasp with dynamometer and the dexterity with box and block was measured. Data were analyzed using independent t-test and paired t-test. **RESULTS:** The mean scores of the two groups in dexterity were significantly different after the intervention ($P=0.008$). However, there was no significant difference between the two groups in grasp. **CONCLUSION:** Mirror therapy in hemiplegic children is useful in improving the dexterity but not in improving of the grasp.

PMID: [31645873](#)

2. The Efficacy of Treadmill Training on Walking and Quality of Life of Adults with Spastic Cerebral Palsy: A Randomized Controlled Trial.

Bahrami F, Noorizadeh Dehkordi S, Dadgoo M.

Iran J Child Neurol. 2019 Fall;13(4):121-133.

OBJECTIVES: We aimed to evaluate the efficacy of treadmill training on walking speed and endurance and quality of life in ambulatory adults with spastic cerebral palsy (CP) versus traditional physiotherapy. **MATERIALS & METHODS:** Participants (17 men, 13 women; mean (SD) age 25 yr, 9 m (7 yr, 10m) range 18-45) with Gross Motor Function Classification System (GMFCS) levels below IV (I, II, and III) from the Ra'ad Rehabilitation Goodwill Complex, Tehran, Iran randomly were allocated to the experimental and the control groups each with 15 persons in 2014. The training (treadmill for experimental group and conventional physiotherapy for control group) was conducted two times a week for 8 weeks. Statistical analysis was made by Repeated Measures of ANOVA for changes within the group during the time and Independent t and Mann-Whitney U tests for the differences between the groups. **RESULTS:** Although the experimental group showed a significant improve in the gait speed [1.08(0.47) m/s to 1.22(0.50) m/s] ($P=0.002$) and in the gait endurance [291.13(160.28) m to 342.63 (174.62) m] ($P=0.002$), however the changes of the outcome measures of walking and quality of

life the between groups were not significant. **CONCLUSION:** The treadmill training without body weight support would improve walking speed and endurance in adults with spastic CP. It would not be however more effective than the traditional physiotherapy to increase the gait performances and function and the quality of life in adults with CP.

PMID: [31645872](#)

3. The Role of Cross-Links in Posterior Spinal Fusion for Cerebral Palsy-Related Scoliosis.

Usmani MF, Shah SA, Yaszay B, Samdani AF, Cahill PJ, Newton PO, Marks MC, Sponseller PD.

Spine (Phila Pa 1976). 2019 Nov 1;44(21):E1256-E1263. doi: 10.1097/BRS.0000000000003117.

STUDY DESIGN: Retrospective review of a multicenter, prospective database. **OBJECTIVE:** Our aim was to compare complication rates and maintenance of radiographic correction at 2 years after posterior spinal fusion (PSF) with or without cross-links in patients with cerebral palsy (CP)-related scoliosis. **SUMMARY OF BACKGROUND DATA:** Cross-links are frequently used in PSF to correct scoliosis in patients with CP because they are thought to increase the stiffness and torsional rigidity of the construct. **METHODS:** We reviewed the records of patients with CP who underwent primary PSF with or without cross-links between August 2008 and April 2015. Inclusion criteria were minimum follow-up of 2 years, availability of complications data (implant failure, surgical site infection, revision), and pre- and postoperative measurements of the major curve (measured using the Cobb method). The 256 patients included in this analysis had a mean age of 14.1±2.7 years. Ninety-four patients had cross-links (57% using one cross-link; 43% using two cross-links) and 162 patients did not have cross-links. $P < 0.05$ was considered statistically significant. **RESULTS:** The two groups did not differ significantly with regard to sex, age at surgery, preoperative menarche status, Gross Motor Function Classification System level, major curve magnitude, pelvic obliquity, kyphosis, and lordosis angles. There were no significant differences between groups in the correction achieved or the maintenance of correction at 2 years for the major curve, pelvic obliquity, kyphosis, or lordosis (all $P > 0.05$). Complication rates were similar between the cross-link group (16%, N=15) and the non-cross-link group (14%, N=22). **CONCLUSION:** At 2 years after PSF to treat CP-related scoliosis, patients had no significant differences in the degree of correction achieved, the maintenance of correction, or the rate of complications between those whose fusion constructs used cross-links and those whose constructs did not. **LEVEL OF EVIDENCE:** 3.

PMID: [31634301](#)

4. Intrathecal baclofen versus selective dorsal rhizotomy for children with cerebral palsy who are nonambulant: a systematic review.

Davidson B, Schoen N, Sedighim S, Haldenby R, Dalziel B, Breitbart S, Fehlings D, Milo-Manson G, Narayanan UG, Drake JM, Ibrahim GM.

J Neurosurg Pediatr. 2019 Oct 18;1-9. doi: 10.3171/2019.8.PEDS19282. [Epub ahead of print]

OBJECTIVE: Cerebral palsy (CP) is the most common childhood physical disability. Historically, children with hypertonia who are nonambulatory (Gross Motor Function Classification System [GMFCS] level IV or V) were considered candidates for intrathecal baclofen (ITB) therapy to facilitate care and mitigate discomfort. Selective dorsal rhizotomy (SDR) was often reserved for ambulant children to improve gait. Recently, case series have suggested SDR as an alternative to ITB in selected children functioning at GMFCS level IV/V. The objective for this study was to systematically review the evidence for ITB and SDR in GMFCS level IV or V children. **METHODS:** Medline, Embase, Web of Science, and Cochrane databases were systematically searched. Articles were screened using the following inclusion criteria: 1) peer-reviewed articles reporting outcomes after SDR or ITB; 2) outcomes reported using a quantifiable scale or standardized outcome measure; 3) patients were < 19 years old at the time of operation; 4) patients had a diagnosis of CP; 5) patients were GMFCS level IV/V or results were reported based on GMFCS status and included some GMFCS level IV/V patients; 6) article and/or abstract in English; and 7) primary indication for surgery was hypertonia. Included studies were assessed with the Risk of Bias in Non-Randomized Studies - of Interventions (ROBINS-I) tool. **RESULTS:** Twenty-seven studies met inclusion criteria. The most commonly reported outcomes were spasticity (on the Mean Ashworth Scale) and gross motor function (using the Gross Motor Function Measure), although other outcomes including frequency of orthopedic procedures and complications were also reported. There is evidence from case series that suggests that both ITB and SDR can lower spasticity and improve gross motor function in this nonambulatory population. Complication rates are decidedly higher after ITB due in part to the ongoing risk of device-related complications. The heterogeneity among study design, patient selection, outcome selection, and follow-up periods was extremely high, preventing meta-analysis. There are no comparative studies, and meaningful health-related quality of life outcomes such as care and comfort are lacking. This review is limited by the high risk of bias among included studies. Studies of SDR or ITB that did not clearly describe patients as being GMFCS level IV/V or nonambulatory were excluded. **CONCLUSIONS:** There is a lack of evidence comparing the outcomes of ITB and SDR in the nonambulatory CP population.

This could be overcome with standardized prospective studies using more robust methodology and relevant outcome measures.

PMID: [31628286](#)

5. Test-retest & Inter-rater Reliability of Persian Version of Pediatric Balance Scale in Children with Spastic Cerebral Palsy.

ALIMI E, Kalantari M, Nazeri AR, Akbarzade Baghban A.

Iran J Child Neurol. 2019 Fall;13(4):163-171.

OBJECTIVES: Children affected with spastic cerebral palsy suffering a lot of movement and balance difficulties. Balance is one of the essential variables of movement, which facilitates functional skills. The main purpose of this study was inter-rater & test-retest reliability of Pediatric Balance Scale (PBS) in children with spastic cerebral palsy. **MATERIALS & METHODS:** In this analytical-descriptive research performed in the rehabilitation centers, south of Tehran, Iran in 2016, psychometric method was used. For investigating the inter-rater reliability, two examiners performed the scale simultaneously with 50 children with spastic cerebral palsy. Moreover, to investigate the test-retest reliability, the scale was implemented by one examiner, in two different sessions, among 50 children with spastic cerebral palsy. There was a two-week period between the first and the second session. **RESULTS:** The inter-rater reliability (ICC=0.99), as well as the test-retest reliability (ICC=0.99), was quite high. Standard Error of Measurement (SEM) was acceptable for either test-retest or inter-rater reliability. **CONCLUSION:** PBS is appropriate for measuring functional balance in children with spastic cerebral palsy with mild to moderate motor impairment.

PMID: [31645876](#)

6. [Nutritional status of a population with moderate-severe cerebral palsy: Beyond the weight].

Martínez de Zabarte Fernández JM, Ros Arnal I, Peña Segura JL, García Romero R, Rodríguez Martínez G.

An Pediatr (Barc). 2019 Oct 19. pii: S1695-4033(19)30243-7. doi: 10.1016/j.anpedi.2019.06.003. [Epub ahead of print] [Article in Spanish]

INTRODUCTION: Cerebral palsy (CP) is the most frequent cause of motor disability in the paediatric age. The aim of this article is the study of the nutritional status of patients with CP followed-up in a reference hospital, as well as the relationship between neurological and nutritional state. **MATERIAL AND METHODS:** A cross-sectional, observational, descriptive and analytical study was conducted on a sample consisting of 4-15 years old patients with CP with Gross Motor Function Classification System (GMFCS) grades III-IV-V, from a specialised paediatric hospital reference area. An interview (collection of general data, medications and nutritional habits), anthropometric study and bioimpedance (BIA) measurements were carried out. **RESULTS:** The study included 69 patients (recruitment 84.15%), with a mean age of 10.46±0.43 years, and 50.7% females. The distribution according to GMFCS scale was: grade III (36.2%), grade IV (29%), and grade V (34.8%). According to weight for height: moderate malnutrition 21.8% (grade V: 33.3%), severe malnutrition 5.8% (grade V: 12.6%), overweight/obesity 23.2% (grade III: 24%, grade IV: 35%). Adequate level of lean mass for height: grade III (36%), grade IV (55%), and grade V (16.7%). Fat excess: grade III (36%), grade IV (40%), and grade V (29.2%). Fat mass comparison: BIA 6.89±0.64 kg versus anthropometry 5.56±4.43 kg. **CONCLUSIONS:** In CP grade GMFCS V, the weight deficit associated with a decrease in lean body mass is common. Patients with CP grades GMFCS III-IV have a significant prevalence of overweight/obesity. Anthropometry is a useful tool for nutritional assessment in children with CP, although fat levels could be underestimated.

PMID: [31640907](#)

7. Distinct Gut Microbiota Composition and Functional Category in Children With Cerebral Palsy and Epilepsy.

Front Pediatr. 2019 Oct 1;7:394. doi: 10.3389/fped.2019.00394. eCollection 2019.

Cerebral palsy (CP) and epilepsy are two interactive neurological diseases, and their clinical treatment can cause severe side-effects in children's development, especially when it involves long-term administration of antiepileptic drugs. Accumulating studies on the gut-brain axis indicated that the gut microbiota (GM), which participates in various neurological diseases, would provide a harmless therapeutic target for the treatment of CP and epilepsy. To explore the GM characteristics in children with both CP and epilepsy (CPE), we collected fecal samples from 25 CPE patients (CPE group) and 21 healthy children (Healthy

group) for 16S rDNA sequencing. In this study, we discovered significantly higher microbial diversity in the CPE group compared to healthy group ($P < 0.001$). After selecting the top 15 most abundant genera in each group, we found significantly enriched *Bifidobacterium*, *Streptococcus*, *Akkermansia*, *Enterococcus*, *Prevotella*, *Veillonella*, *Rothia*, and *Clostridium IV* in the CPE group, and noticeably reduced *Bacteroides*, *Faecalibacterium*, *Blautia*, *Ruminococcus*, *Roseburia*, *Anaerostipes*, and *Parasutterella*. A GM co-occurrence network was also constructed, and negative correlations were discovered between *Bacteroides* and *Lactobacillus* ($r = -0.768$, $P < 0.001$, $FDR < 0.001$), as well as *Intestinibacter* and *Bifidobacterium* ($r = -0.726$, $P < 0.001$, $FDR < 0.001$). After KEGG annotation and functional enrichment, 24 functional categories exhibited different enrichment levels between the CPE and Healthy groups. The functions, associated with xenobiotics metabolism, immune system diseases, and neurodegenerative diseases, were enriched in the CPE group. Conversely, the functional categories related to the biosynthesis of secondary metabolites were reduced. Furthermore, the neurodegenerative diseases were mainly attributed to *Streptococcus*, while an increased risk of immune system diseases was associated with enriched *Akkermansia* in the CPE patients. Generally, this study characterized the GM in CPE patients, illustrated the microbial co-occurrence relationships, and detected the functional distributions of the bacteria.

PMID: [31646147](#)

8. Brain abnormalities in infantile esotropia as predictor for consecutive exotropia.

Calis F, Atilla H, Bingol Kiziltunc P, Alay C.

Strabismus. 2019 Oct 22;1-6. doi: 10.1080/09273972.2019.1677729. [Epub ahead of print]

Cerebral palsy, neurological abnormalities, prematurity or periventricular lesions may affect motor and sensory fusion mechanisms that favorably control eye alignment. White matter damage of immaturity (WMDI) is a form of white matter brain injury characterized by the necrosis of white matter near the lateral ventricles. In these cases, it is difficult to establish fusion after strabismus surgery and consecutive deviations may be seen more frequently especially in association with WMDI. The aim of this study is to evaluate and compare the cerebral magnetic resonance imaging (MRI) findings in operated infantile esotropia cases with and without consecutive exotropia and to relate them to the occurrence of consecutive exotropia. Seventeen patients that had consecutive exotropia after bilateral medial rectus recession surgery for infantile esotropia were included in this study (group 1) and patients that were operated with the same diagnosis with a successful surgical outcome (≤ 10 PD of deviation) were recruited as group 2. Age, sex, consanguinity, associated systemic and neurological diseases, prematurity, visual acuity, angle of deviations at first visit, at last and follow-up visit and after surgery, cycloplegic retinoscopy, fundus and cerebral MRI findings were recorded. Demographic and clinical findings of patients in two groups and MRI findings were evaluated and compared. The mean age at the time of first examination was 8.21 ± 6.62 and 7.45 ± 4.94 months in infantile esotropia patients with (group 1) and without consecutive exotropia (group 2), respectively. The mean cycloplegic refractive errors ($+1.92 \pm 1.57$ D vs. $+2.30 \pm 1.10$ D), the mean preoperative angle of deviation (46.33 ± 18.8 PD vs. 34.8 ± 12.5 PD), sex, percentage of consanguinity, percentage of prematurity, presence of latent nystagmus, dissociated vertical deviation and amblyopia and fundus findings were similar in both groups. Patients with consecutive exotropia had a mean deviation angle of 37.5 ± 9.48 PD postoperatively. Cerebral MRI findings were consistent with WMDI (three patients), myelination delay (one patient), septo-optic dysplasia (one patient) and periventricular cysts (one patient) in group 1. Cerebellar hemispheres and vermis hypoplasia (one patient), myelination delay (one patient), cerebellar atrophy (one patient) were the MRI findings of patients in group 2. White matter damage of immaturity was only present in the consecutive exotropia group. This finding may suggest that WMDI can be a risk factor for consecutive deviation in infantile esotropia patients.

PMID: [31637944](#)

9. Development and exploration of a Japanese version of the cerebral palsy quality of life for children questionnaire for primary caregivers: a pilot study.

Mutoh T, Mutoh T, Kurosaki H, Shimomura H, Taki Y.

J Phys Ther Sci. 2019 Sep;31(9):724-728. doi: 10.1589/jpts.31.724. Epub 2019 Sep 5.

[Purpose] We aimed to translate and validate a Japanese language version of the cerebral palsy quality of life for children questionnaire for primary caregivers and assess the relationship between quality of life of Japanese parents and their children's motor skills. [Participants and Methods] Fifty children (aged 4 to 12 years) and their parents (mothers) were enrolled. The parent-proxy version of the cerebral palsy quality of life for children questionnaire translated to Japanese was administered, and a validation study was performed using Cronbach's α as the key metric. The relationships between the parents' quality of life and children's Gross Motor Function Classification Scale levels were analyzed. [Results] We found that the age of the children and their parents and gender of the children were not significant factors affecting the quality of life domains. Significantly high values of internal consistency were detected among items within each quality of life domain, wherein Cronbach's α was

between 0.72 and 0.89. Two quality of life domains (Emotional well-being and Feeling about functioning) were significantly associated with Gross Motor Function Classification Scale levels. [Conclusion] Our data suggest that the original English version of the cerebral palsy quality of life for children questionnaire for primary caregivers was successfully translated to Japanese for use by Japanese-speaking parents caring for their children.

PMID: [31631945](#)

10. Behavioral difficulties, sleep problems, and nighttime pain in children with cerebral palsy.

Horwood L, Li P, Mok E, Oskoui M, Shevell M, Constantin E.

Res Dev Disabil. 2019 Oct 17;95:103500. doi: 10.1016/j.ridd.2019.103500. [Epub ahead of print]

BACKGROUND: Children with cerebral palsy (CP) may be at risk of behavioral difficulties. **AIMS:** 1) Determine the prevalence of behavioral difficulties in preschool- and school-aged children with CP and 2) Assess the association between behavioral difficulties and a) sleep problems, b) nighttime pain and c) child characteristics (age, CP phenotype, comorbidities). **METHODS AND PROCEDURES:** Caregivers of 113 children with CP aged 4-12 years [mean (SD) age = 7.4 (2.5) years; 61.9% male] completed the Strengths and Difficulties Questionnaire, Sleep Disturbance Scale for Children and a sleep quality questionnaire to assess child behavior, sleep and nighttime pain, respectively. **OUTCOMES AND RESULTS:** 25.6% of children (17.6% preschool-aged; 29.1% school-aged) had behavioral difficulties. Sleep problems (odds ratio [OR] 9.1, 95% confidence interval [CI] 3.4-24.4) and nighttime pain (OR 4.1, 95% CI 1.5-11.5) were associated with behavioral difficulties. Sleep problems remained significantly associated with behavioral difficulties (adjusted OR 7.5, 95% CI 2.6-21.4) when adjusted for nighttime pain, age and non-ambulatory status. **CONCLUSIONS AND IMPLICATIONS:** Behavioral difficulties were reported in one in four children with CP and were associated with sleep problems and nighttime pain. Identifying and treating behavioral difficulties, sleep problems or nighttime pain is important in the care of children with CP.

PMID: [31630025](#)

11. Assessing the quality, efficiency and usefulness of the Western Australian population-based Intellectual Disability Exploring Answers (IDEA) surveillance system: a surveillance system evaluation.

Strobel NA, Bourke J, Leonard H, Richardson A, Edmond KM, McAullay D.

BMJ Open. 2019 Oct 18;9(10):e026003. doi: 10.1136/bmjopen-2018-026003.

OBJECTIVES: Our overall aim was to evaluate the Western Australian Intellectual Disability Exploring Answers (IDEA) surveillance system. The primary objective was to evaluate the attributes of the system. The secondary objective was to provide recommendations to data custodians and stakeholders to strengthen the system. **METHOD:** The IDEA system was evaluated using process observation, interviews and secondary data analysis of system attributes: usefulness, simplicity, data quality, acceptability, representativeness, timeliness and stability. 2001 US Centers for Disease Control and Prevention guidelines were used. **RESULTS:** We found that the IDEA system was useful, simple, flexible, acceptable, representative, timely and stable. We compared individuals from the IDEA system (n=10 593) with those with cerebral palsy and intellectual disability (ID) (n=582) from another surveillance system. Of the 582 with cerebral palsy and ID, 501 (86.1%) were in the IDEA system and 81 (13.9%) were not. In total, 0.7% of cases (81/10674) with ID were not identified in the IDEA system. There were little differences in cases that were not identified in the IDEA system between Indigenous status, sex and place of residence. **CONCLUSIONS:** The strengths of the IDEA system include having a high data quality resource contributing to national and international data on ID, strong government support and a dedicated management team. Output from studies linking to IDEA data have had major contributions to the international literature about ID. However, limited resources have prevented it from realising its full potential in relation to translational activities. The IDEA system is a valuable resource to address the needs of people living with ID.

PMID: [31630096](#)

12. Quality-of-Life Evaluation of Healthy Siblings of Children with Chronic Illness

Dinleyici M, Carman KB, Özdemir C, Harmancı K, Eren M, Kirel B, Şimşek E, Yazar C, Duyan Çamurdan A, Şahin Dağlı F.

Balkan Med J. 2019 Oct 24. doi: 10.4274/balkanmedj.galenos.2019.2019.7.142. [Epub ahead of print]

BACKGROUND: Chronic illness during childhood can also cause changes in the health-related quality of life (HrQoL) of the individual's family members. **AIM:** This study aimed to evaluate the HrQoL among healthy siblings of children with chronic illness. **STUDY DESIGN:** Cross-sectional study. **METHODS:** We enrolled healthy siblings of 191 children with a chronic illness (cerebral palsy, epilepsy, diabetes, celiac disease, hematological oncologic disease, or asthma) and those siblings of 100 healthy children for quality of life evaluation. We administered the Pediatric Quality of Life Inventory questionnaire; the physical health and psychosocial health score were calculated using individual sibling and parent responses. The primary endpoint was the comparison of HrQoL scores of healthy siblings of 191 children with a chronic illness and those siblings of 100 healthy children. **RESULTS:** The physical health, psychosocial health, and total health scores of healthy siblings of children with a chronic illness were significantly lower than those of siblings of healthy children ($p < 0.001$). In the chronic disease group, the lowest psychosocial health score was found in the cerebral palsy, hematologic/oncologic disease and asthma groups ($p < .001$). The global impact on the quality of life for healthy siblings of children with a chronic disease was significantly higher in children's self-reports than in parents' reports (30.4% vs. 15.1%, $p < 0.05$). **CONCLUSION:** This study showed that most of the healthy siblings of children with a chronic illness are physically and psychosocially affected. In healthy siblings, we observed a global impact on the HrQoL, including psychosocial scores, and a low level of parental awareness about this situation. This might increase the risk of emotional neglect and abuse in these children. Thus, special support programs are needed for the families of children with chronic illness.

PMID: [31647208](#)

13. Specific White Matter Lesions Related to Motor Dysfunction in Spastic Cerebral Palsy: A Meta-analysis of Diffusion Tensor Imaging Studies.

Jiang H, Liu H, He H, Yang J, Liu Z, Huang T, Lyu J, Li X.

J Child Neurol. 2019 Oct 24;883073819879844. doi: 10.1177/0883073819879844. [Epub ahead of print]

BACKGROUND: Assessing motor impairment in spastic cerebral palsy is a key factor in the treatment and rehabilitation of patients. We intend to investigate the correlation between diffusion tensor imaging properties of sensorimotor pathways and motor function in spastic cerebral palsy using meta-analysis, and to determine specific white matter lesions that are closely related to motor dysfunction in spastic cerebral palsy. **METHODS:** We conducted a literature search of PubMed, Embase, Scopus, and Web of Science databases to identify trials published from January 1999 to January 2019 that had evaluated the correlation between fractional anisotropy and motor function scores in spastic cerebral palsy. Correlation coefficient (r) values were extracted for each study, and the extent of r was quantitatively explored. The r values between fractional anisotropy within different sensorimotor pathways and motor function scores were pooled respectively. **RESULTS:** Nineteen studies involving 504 children with spastic cerebral palsy, were included. Fractional anisotropy in both sensory and motor pathways significantly correlated with motor function scores. However, compared with the corticospinal tract and thalamic radiation, fractional anisotropy in the posterior limb of the internal capsule correlated more strongly with gross motor function classification system and upper limb motor function ($r = -0.71$, 95% confidence interval [CI] -0.80 to -0.60; $r = 0.73$, 95% CI 0.60-0.82, respectively; $P < .05$). **CONCLUSIONS:** Fractional anisotropy within the posterior limb of the internal capsule is more closely related to motor dysfunction and can potentially be a biomarker for evaluating the degree of motor impairment in spastic cerebral palsy.

PMID: [31646936](#)

14. Does Co-occurred Cerebral Palsy Change the Prognosis of West Syndrome?

Nagy E, Farkas N, Hollódy K.

Neuropediatrics. 2019 Oct 22. doi: 10.1055/s-0039-1698450. [Epub ahead of print]

AIM: We aimed to examine the occurrence of cerebral palsy (CP) in children with West syndrome (WS), to estimate the possible causative factors by analyzing the neuroimaging examinations of patients, to evaluate their cognitive/motor function and epileptic status and to compare the prognosis of children with double pathology of WS and CP and of those without CP. **METHODS:** The clinical and magnetic resonance imaging (MRI) data of 62 patients with West syndrome were evaluated. A total of 39 of 62 patients (63%) suffered from CP (CP group). The non-CP group included 23 patients. **RESULTS:** Abnormal MRI was found in 55/62 (89%) patients. Main anomalies were: brain malformation (21), hypoxic-ischemic encephalopathy (13), cerebrovascular insult (8), infection (7), and other anomalies (6). In the CP group, the most common MRI abnormalities included pre/perinatal hypoxia/ischemia, brain malformation, cerebrovascular insult, and infection. In the non-CP group, brain malformations were the most frequent. Significantly more negative MRIs were found in the non-CP group. More than 60% of the patients were severely cognitively impaired, almost 90% of them had CP. Not only the occurrence of intellectual disability was lower in the non-CP group, but its severity was milder as well. A total of 78% of the children with CP had a very severe

motor disability. Fifty-four percent in the CP and 67% in the non-CP group had therapy-resistant epilepsy. **CONCLUSION:** WS has an especially unfavorable prognosis: cerebral anomaly was confirmed in 89% of our patients. CP was present in almost two-thirds of the children with WS, most of them had severe cognitive and motor deficits.

PMID: [31639881](#)

15. A case report of multiple cerebral abscess formation complicating serogroup B *Neisseria meningitidis* meningitis.
O'Connor C, Collins A, Twomey E, Hensey C, Caird J, Gavin PJ.

BMC Infect Dis. 2019 Oct 21;19(1):863. doi: 10.1186/s12879-019-4509-y.

BACKGROUND: Invasive meningococcal disease (IMD) presenting with meningitis causes significant mortality and morbidity. Suppurative complications of serogroup B meningococcal sepsis are rare and necessitate urgent multidisciplinary management to mitigate long-term morbidity or mortality. **CASE PRESENTATION:** We present a rare case of invasive meningococcal disease in a 28-month old boy complicated by multiple abscess formation within a pre-existing antenatal left middle cerebral artery territory infarct. Past history was also notable for cerebral palsy with right hemiplegia, global developmental delay and West syndrome (infantile spasms). Two craniotomies were performed to achieve source control and prolonged antimicrobial therapy was necessary. The patient was successfully discharged following extensive multidisciplinary rehabilitation. **CONCLUSIONS:** Longstanding areas of encephalomalacia in the left MCA distribution may have facilitated the development of multiple meningococcal serogroup B abscess cavities in the posterior left frontal, left parietal and left temporal lobes following an initial period of cerebritis and meningitis. A combination of chronic cerebral hypoperfusion and some degree of pre-existing necrosis in these areas, may also have facilitated growth of *Neisseria meningitidis*, leading ultimately to extensive cerebral abscess formation following haematogenous seeding during meningococemia. In this case report we review similar cases of cerebral abscess or subdural empyema complicating serogroup B meningococcal meningitis.

PMID: [31638913](#)

Prevention and Cure

16. Synergistic Improvement in Children with Cerebral Palsy Who Underwent Double-Course Human Wharton's Jelly Stem Cell Transplantation.

Fu X, Hua R, Wang X, Wang P, Yi L, Yu A, Yang J, Li Y, An Y.

Stem Cells Int. 2019 Sep 17;2019:7481069. doi: 10.1155/2019/7481069. eCollection 2019.

BACKGROUND: Our previous studies confirmed that human Wharton's Jelly stem cell (hWJSC) transplantation improved motor function in children with spastic cerebral palsy (CP). This study investigated the dose-effect relationship between the transplanted cell dosage and efficacy in CP children. **METHODS:** CP children who received one- or two-course (four or eight times lumbar puncture, 4 or 8 × 10⁷ hWJSCs) cell therapy were recruited into this study. Assessments of motor function were performed according to scales for gross motor function measurement (GMFM) and fine motor function measurement (FMFM). The measurement data obtained in the two different groups were analyzed by t-test. Univariate repeated measures analysis of variance was used to compare the data obtained at baseline and 6 or 12 months posttransplantation and met the conditions for Mauchly's sphericity test. **RESULTS:** The results for fifty-seven pediatric CP patients (including 35 male and 22 female patients) who completed follow-up showed that gross and fine motor functions improved after cell therapy. Interestingly, the GMFM and FMFM scores in patients who received one course of transplantation were significantly increased at 6 months after treatment. Moreover, another course of transplantation further improved gross and fine motor function in children. The scores for GMFM and FMFM were significantly higher at 6 months posttransplantation than at baseline and showed a linear upward trend. There was no gender difference in GMFM. Interestingly, there was a significant difference between male and female patients in the B and C dimensions of FMFM. These results reveal a gender-related susceptibility to stem cell therapy, especially for movement capability of the upper extremity joint and grasping ability. Similarly, in the group aged ≤3 years old, the improvement observed in dimension A (lying and rolling) of GMFM was nearly exponential and showed a quadratic trend. The results for FMFM were similar to those for GMFM. Moreover, the improvement in motor function was not age dependent. **CONCLUSIONS:** In this study, our data collectively reveal that CP children display sex- or age-dependent responses to hWJSC therapy; these results shed light on the clinical utility of this approach in specific populations.

PMID: [31636676](#)