

OC-080 | Action observation training to treat upper limb functions in infants with a unilateral brain lesion - a feasibility study

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Introduction: The aim of this study was to evaluate the adherence, feasibility, and acceptability of an action observation training (AOT) as a new therapy approach to improve bimanual hand function in infants with hemiparesis. In addition, accelerometers for movement measurement were evaluated.

Patients and Methods: This study included infants with a unilateral brain lesion. The AOT was planned for 4 weeks, 20 minutes a day (total 560 min). Therapy adherence was evaluated using a diary, feasibility and acceptability with self-designed questionnaires. Hand function was documented before and after the intervention using the Hand Assessment for Infants [HAI] and the Mini-Assisting Hand Assessment (Mini-AHA). Accelerometers were used to measure asymmetry of both upper extremities (2 days/week) and during the HAI/Mini-AHA. Their usability was assessed with the System Usability Scale (SUS) and a self-designed questionnaire.

Results: 8 infants participated in the study. Adherence was excellent with a mean exercise time of 607 minutes. Feasibility was rated with a score of 82%, acceptability with 73%. HAI and Mini-AHA scores significantly improved from pre- to post-test (HAI $p = 0.018$; Mini-AHA $p = 0.011$). Spearman correlation of the accelerometry with the HAI was $r_s = -0.69$, with the Mini-AHA $r_s = -0.76$ ($p \leq 0.05$). The SUS and questionnaire score were 91% and 88%, respectively.

Conclusion: AOT can be performed with infants and is well accepted among parents. Further research is needed to investigate its efficacy. Accelerometry measurements to assess upper limb movement asymmetry are feasible, and correlate with the clinical outcomes. Accelerometers could be used in future studies.

OC-081 | Neural correlates of mirror movements in children with arterial ischemic stroke

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Background: Mirror movements (MM) in pediatric stroke patients are related to abnormal ipsilateral Corticospinal Tract (CST). Whilst children with contralateral CST wiring may also present with MM, the role of interhemispheric interactions remains unknown. Here, we investigated the role of interhemispheric inhibition, facilitation and functional connectivity on MM in children with contralateral CST after arterial ischemic stroke.

Patients and Methods: 16 patients with pediatric stroke and contralateral CST wiring were included. Participants underwent multimodal examination including dual-pulse transcranial magnetic stimulation to measure interhemispheric inhibition (10 milliseconds interstimulus interval, measured on the flexor digitorum superficialis) and resting-state functional MRI to assess motor network functional connectivity between primary motor cortices. MM were measured with the Woods and Teuber scale in each hand (hand opening and closing, finger opposition and sequential finger movement). We conducted non-parametric correlation analysis and interpreted r-values as absent (<0.25), fair (0.25–0.50), moderate (0.50–0.75) or excellent (>0.75).

Results: Higher MM-scores in the affected hand were related to (1) lower interhemispheric functional connectivity between the primary motor cortices ($r = -0.48$, $p = 0.06$), (2) higher inhibition from the non-lesioned to the lesioned hemisphere ($r = 0.65$, $p = 0.01$) and (3) slightly higher facilitation from the lesioned to the non-lesioned hemisphere ($r = 0.36$, $p = 0.27$). MM-scores in the non-affected hand were higher with facilitation from the lesioned to the non-lesioned hemisphere ($r = 0.76$, $p = 0.006$).

Conclusion: In children with arterial ischemic stroke and contralateral CST wiring, the active motor cortex may facilitate the contralateral motor cortex and increase the

occurrence of MM, highlighting the importance of inter-hemispheric interactions for this phenomenon.

Assessments

OC-082 | Agreement of the World Health Organization Disability Assessment Schedule (WHODAS 2.0) between parents and youth with physical illness

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Introduction: This study modelled the factor structure and tested for measurement invariance between youth and parent reports on the 12-item World Health Organization Disability Assessment Schedule (WHODAS) 2.0; estimated agreement between informants; and, examined moderators of youth-parent discrepancies.

Patients and Methods: Data come from the baseline wave of the Multimorbidity in Youth across the Life-course study ($n = 117$). Multiple-group confirmatory factor analysis was used to test for measurement invariance of the WHODAS 2.0 and Wilcoxon signed-rank tests compared youth and parent scores. Intraclass correlation coefficient (ICC) and Bland–Altman limits of agreement plots were used to examine youth-parent agreement. Multiple regression was used to identify moderators of informant discrepancy.

Results: The WHODAS 2.0 demonstrated measurement invariance between informants ($\chi^2 = 221.8[136]$, $p < 0.01$; RMSEA = 0.073 [0.055, 0.091]; CFI = 0.962; and, SRMR = 0.078), though parameter constraints were released on the residuals for items Q8 (wash) and Q10 (people). Youth typically reported more disability compared to parent proxies, with the exception of item Q5 (emotional). Agreement was low (ICC = 0.08–0.53). Youth sex moderated informant agreement such that more consistent agreement was seen for female youth ($\beta = 0.53$, $p < 0.01$) compared to male youth ($\beta = 0.09$, $p = 0.38$).

Conclusion: Youth and their parents interpret the construct of disability, as measured by the WHODAS 2.0, similarly. Thus, informant differences represent real differences that are not a consequence of error. Low agreement between youth and parents reinforces the need for collecting multiple perspectives in the pediatric setting, especially for male youth.

OC-083 | Challenge-20 test for measuring advanced motor skills in children with cerebral palsy: Age related norms with typically developing children

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Aim: Develop age related norms for the *Challenge-20* with typically developing (TD) children and explore how scores of children with cerebral palsy (CP), in Gross Motor Function Classification System (GMFCS) level I and II compare to these age norms.

Method: 150 TD children 7–12 years ($m = 69$; $f = 81$) in 5 age groups were enrolled and tested using *Challenge-20* to determine age related norms, and compared with results of children with CP ($n = 191$), GMFCS level I ($n = 135$) and II ($n = 56$), 5–18 years.

Results: Reference curves by age and *Challenge-20* score, plotted across 5th to 95th percentiles. Younger TD children (7–8 years) scored lower (~50%) and older children (9–12 years) scored $\geq 85\%$ and higher on *Challenge-20* showing similar developmental trajectories. Children with CP follow similar, albeit lower, *Challenge-20* score trajectory to that of TD children with continued progression beyond age 12. Highest scores came close or overlapped (15% of cases) with the lowest scores of TD children.

Interpretation: *The Challenge-20* is sensitive to progression in advanced gross motor skills in TD children. Children with CP in GMFCS I and II follow similar, albeit lower, *Challenge* score trajectory to that of TD children, and in some cases children in GMFCS level I came close to lower level abilities of TD children. The reference percentiles extend clinical utility of the *Challenge-20* for re-thinking advanced gross motor interventions in children with CP at GMFCS levels I and II given their potential to progress along the developmental trajectory.