MOTOR SKILLS AND ADVANCED GROSS MOTOR PERFORMANCE CORRELATE WITH WHITE MATTER MICROSTRUCTURE IN ADULTS WITH VERY LOW BIRTH WEIGHT

K.A. Evensen¹, S. Lund², A. Olsen³, L. Eikenes⁴, A. Håberg⁴, J. Skranes^{2,5,6}, **A.-M. Brubakk^{2,5}**

¹Public Health and General Practice, ²Laboratory Medicine, Children's and Women's Health, ³Circulation and Medical Imaging, ⁴Neuroscience, Norwegian University of Science and Technology, ⁵Pediatrics, St. Olavs Hospital, Trondheim University Hospital, Trondheim, ⁶Pediatrics, Sørlandet Hospital, Arendal, Norway

Background: Subjects born preterm with very low birth weight (VLBW) often demonstrate motor problems, as well as changes in large parts of cerebral white matter seen on diffusion tensor imaging (DTI).

Aim: Study the association between motor skills and white matter microstructure in VLBW adults and controls.

Design and methods: A matched case-control study of 34 preterm born subjects with birth weight ≤ 1500 g and 31 controls at 22-24 years of age. Motor skills were assessed by Movement Assessment Battery for Children-2 (MABC-2) and advanced gross motor performance by High-Level-Mobility-Assessment-Tool (HiMAT), a novel assessment tool for mild to moderate head injuries, never used in preterm populations before. DTI was acquired on a 3T Siemens Trio. Tract-Based Spatial Statistics was used to explore the relationship between fractional anisotropy (FA) and motor scores.

Results: Total MABC-2 and HiMAT scores were lower in VLBW subjects than in controls ($p \leq 0.01$). Differences were seen in items of walking backwards, running, one-leg hopping and bound on HiMAT. In the VLBW group, lower MABC-2 and HiMAT scores were related to lower FA values in all major central, anterior and posterior tracts (Figure), whereas such positive correlations were not found in controls.

[Figure]

Conclusions: The association between advanced gross motor scores and reduced FA values may indicate compromised connectivity as a cause of motor problems in the VLBW adults.