

Neuropsychology Abstracts

Title: CORTICAL RESPONSES DURING TOUCH PERCEPTION IN CHILDREN WITH SPINA BIFIDA AND HYDROCEPHALUS

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Background: Multiple cognitive and sensorimotor operations rely on the functional and structural integrity of interhemispheric connections. In a group of children with spina bifida myelomeningocele (SBM) we studied the effects of partial agenesis of the CC on the neurophysiological patterns of cortical activation during touch processing, with special interest in cortical responses mediated through transcallosal connections.

Method: Sixteen children with SB (and different degrees of agenesis of the corpus callosum) underwent evaluations which included Magnetoencephalographic recordings of somatosensory evoked fields (SSEFs), high resolution MRI and Diffusion Tensor Imaging (DTI). Cortical responses associated to activity in ipsi- and contralateral somatosensory cortices were estimated and compared to those obtained from a group of aged matched volunteers (N =7). Within the SB group, the relation between amplitude of ipsilateral SII responses and the structural integrity of different segments of the corpus callosum (using DTI-based morphometry) was explored.

Results: Ipsilateral SII activation was present in all control subjects (7 out of 7, 100%) while a significant proportion of children with SB showed no activation of this area (7 out of 16, 43%). In the SB group, the amplitude of the ipsilateral SII responses showed a significant correlation ($r = 0.61$; $p < 0.05$) with the area of the body of the corpus callosum (DTI-based morphometrics).

Conclusion: Our results indicate that atypical neurophysiological patterns in SII activation during touch processing are associated with reduced regional transcallosal connectivity in children with SBH.