Atypical development of the auditory system in children with autism: custom child-sized MEG studies

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Magnetoencephalography (MEG) is a noninvasive neuroimaging technique that provides a measure of cortical neural activity on a millisecond time scale. Recently, we researched the auditory system in young children using custom child-sized MEG in which sensors were located as close to the whole brain as possible for optimal recording in young children. This new device enables us to record brain bilateral function even in young children. The earliest cortical component of the auditory evoked field (i.e., the P1m) is a prominent component in 1- to 10-year-old children. P1m in young children is thought to be a physiological indicator of language acquisition and cerebral laterality. Using the child-customized MEG device, we demonstrated that the children with autism spectrum disorder (ASD) exhibited an atypical development pattern in P1m. Our results contribute to our understanding of diversified pathophysiological mechanisms in the central nervous systems in young children with ASD.