

ISMRM ABSTRACT Advanced MR imaging in Perinatal brain injury – Timing of Injury and Potential for Intervention.

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Magnetic Resonance Imaging (MRI) has become the gold standard test in evaluating the nature and extent of brain injury in both the preterm and term born infant. While imaging this population can be challenging, clinically important information can be obtained safely. Classical patterns of injury differ between the term and preterm infant as do the mechanisms that cause injury. This presentation will review the common patterns of injury in both groups including selective neuronal necrosis, parasagittal cerebral injury, periventricular leukomalacia, intraventricular and parenchymal hemorrhage, and focal ischemic stroke. Conventional images combined with techniques such as diffusion-weighted imaging, diffusion-tensor imaging, spectroscopy, and MRA/MRV provide clues to etiology and timing as well as long term prognosis. As the possibility of intervening in the secondary phase of the neurological injury becomes a reality in the newborn brain, MRI will have a crucial role both in delineating which infants will likely have the most to gain, and also acting as an intermediate biomarker to gauge response. In addition, it may be possible to individualize later neural rehabilitative approaches based on the nature of cerebral injury. Given the enormous potential for functional recovery in the newborn brain, selection of who to treat and how to provide rehabilitation will be crucial. This presentation will summarize current knowledge and outline new MRI techniques which may assist in understanding the timing and impact of injury in the newborn.

References:

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