

 Original Article

Findings and Patterns on MRI and MR Spectroscopy in Neonates after Therapeutic Hypothermia for Hypoxic Ischemic Encephalopathy Treatment

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Abstract

Objectives: The purpose of this study is to describe the findings and patterns of injury on magnetic resonance imaging (MRI) and magnetic resonance spectroscopy (MRS) after whole-body hypothermia treatment for neonatal hypoxic ischemic encephalopathy.

Methods: A retrospective review of consecutive term neonates treated with whole-body hypothermia was performed. Data recorded included demographics and MRI and MRS findings, and day of life (DOL) studies were performed. Injury patterns were classified on MRI as deep, cortical, mixed, or diffuse. The relative apparent diffusion coefficient (rADC) was plotted against DOL scanned and the presence of lactate was recorded.

Results: MRI was performed in 44 infants, 34 of whom also underwent MRS. MRI was abnormal in 32% of neonates, 29.5% of whom were imaged at DOL 4 to 8. rADC values were lowest in neonates scanned on DOL 4 and 5 and remained low up to DOL 8. The deep brain nuclei were involved in hypoxic ischemic encephalopathy in 93% of neonates with abnormal MRIs and lactate was identified on MRS in 18% of neonates between DOL 4 and 8.

Conclusions: MRI performed after therapeutic cooling was abnormal in 29.5% of neonates scanned on DOL 4 to 8. Deep nuclear injury was identified in 93% of neonates. Lactate was present on MRS in 18% of neonates, and rADC values were most reduced on MRI between DOL 4 and 8.

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