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Neonatal auditory activation detected by functional magnetic resonance imaging $\hat{a}^{\sim} \dagger$

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Abstract

The objective of this study was to detect auditory cortical activation in non-sedated neonates employing functional magnetic resonance imaging (fMRI). Using echo-planar functional brain imaging, subjects were presented with a frequency-modulated pure tone; the BOLD signal response was mapped in 5 mm-thick slices running parallel to the superior temporal gyrus. Twenty healthy neonates (13 term, 7 preterm) at term and 4 adult control subjects. Blood oxygen level-dependent (BOLD) signal in response to auditory stimulus was detected in all 4 adults and in 14 of the 20 neonates. FMRI studies of adult subjects demonstrated increased signal in the superior temporal regions during auditory stimulation. In contrast, signal decreases were detected during auditory stimulation in 9 of 14 newborns with BOLD response. fMRI can be used to detect brain activation with auditory stimulation in human infants.



Keywords

Functional magnetic resonance imaging; Auditory cortex; Neonate; Term

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