

T1-weighted MRI of the neonatal brain at 3.0 Tesla: Comparison of spin echo, fast inversion recovery and 3D-turbo field echo technique

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목적: The purpose of this study was to evaluate the usefulness of fast inversion recovery (FIR) and three-dimensional turbo field echo (3D TFE) T1-weighted sequences for neonatal brain imaging compared with spin echo (SE) sequence on a 3T MR unit.

대상 및 방법: T1-weighted axial SE, FIR and 3D TFE sequences were evaluated from 3T brain MR imaging in 20 neonates. The signal-to-noise ratio (SNR) of different tissues was measured in each of the sequences. FIR and 3D TFE sequences were compared with SE sequences quantitatively using contrast-to-noise ratio (CNR) between the different tissues. Visual analysis was carried out by grading gray-white matter differentiation, myelination and artifacts. The Wilcoxon signed ranked test was used for evaluation of the statistical significance of CNR differences between the sequences.

결과: Among the three sequences, the 3D TFE had the best SNRs. CNRs obtained with FIR and 3D TFE were statistically superior to those obtained with SE; these CNRs were better on the 3D TFE compared to the FIR. GM-WM differentiation and myelination were better delineated on the FIR and 3D TFE than the SE. However, motion artifacts were more commonly observed on the 3D TFE and flow-related artifacts of vessels were frequently seen on the FIR.

결론: FIR and 3D TFE are valuable alternatives to conventional SE imaging of the neonatal brain and provide superior image quality.