Double inversion recovery

Double inversion recovery (DIR) is an inversion recovery MRI pulse sequence that uses two different inversion pulses. The technique can be used to suppress signal from two different tissues or to suppress signal that moved between the two pulses.

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evaluated the role of double inversion recovery (DIR) sequence of MRI compared with the conventional gradient-recalled echo (GRE)-T2*-W and susceptibility-weighted imaging (SWI) sequences in the diagnosis of subacute SAH.

Materials and methods: This prospective study was conducted on 21 patients with SAH, which were diagnosed using CT scan at the initial step. In the third week after the injury (14-20 days), all patients underwent a brain MRI exam that included T2*-W, SWI, and DIR imaging sequences. All images were independently read by two radiologists, who were blinded to the clinical history of the patients. The presence or absence of SAH was reviewed and assessed in 6 anatomical regions.

Results: On the DIR images, 20 patients were found to have at least one subarachnoid signal abnormality, while the SWI and T2*-W images identified SAH areas on 17 and 15 patients, respectively. The highest rate of inter-observer consensus by the DIR sequence was found in the interhemispheric fissure and perimesencephalic area (k = 1). Also, a highest rate of inter-observer consensus using SWI was found in the interhemispheric fissure and posterior fossa cistern area (k = 1). A weak agreement was found in frontal-parietal convexity using SWI (k = 0.447), and in posterior fossa cistern by the T2* sequence (k = 0.447).

Conclusion: In conclusion, the DIR sequence was more reliable at identifying signal abnormalities in subacute SAH patients than the T2*-W and SWI sequence, and is suggested as a promising imaging technique for detecting hemorrhagic areas without considering the anatomical distribution of SAH [1)].

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Mardanshahi Z, Tayebi M, Shafiee S, Barzin M, Shafizad M, Alizadeh-Navaei R, Gholinataj A. Evaluation of subacute subarachnoid haemorrhage detection using a magnetic resonance imaging sequence: Double inversion recovery. Biomedicine (Taipei). 2020 Dec 1;10(4):29-35. doi: 10.37796/2211-8039.1058. PMID: 33854932; PMCID: PMC7735974.