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(14:20-14:30)

IN VIVO ^{1}H-MRS QUANTIFICATION OF BRAIN METABOLITES USING WATER AS AN INTERNAL STANDARD

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목적 : The reliability of absolute quantification of average metabolite concentrations in the human brain in vivo by ^{1}H-MRS using the fully relaxed water signal as an internal standard was evaluated in a number of in vitro as well as in vivo measurements.

대상 및 방법 : The experiments were performed on 3T MEDINUS MAGNUM MR-scanner using a STEAM sequence.

결과 : In vitro studies indicate a very high correlation between metabolite signals (area under peaks) and concentration, R = 0.99 as well as between metabolite signals and the volume of the selected voxel, R=1.00. The error in quantification of N-acetyl aspartate (NAA) concentration was approximately 1-2mM (6-12%). Also in vivo a good linearity between water signal and selected voxel size was observed. Calculated average concentrations of NAA, creatine (Cr), and choline (Cho) in the occipital lobe of the brain in five healthy volunteers were (mean±1SD) 11.6±1.3mM, 7.6±1.4mM, and 1.7 ±0.5mM, respectively.

결론 : The present results demonstrated that the method presented could provide reasonable estimation of metabolite concentrations in the brain in vivo and therefore is useful in various clinical research.