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Investigation of MR spectra by TE and metabolite amount in the localized voxel using the MR cone-shape phantom

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목적 : The purpose of this study is to investigate the spectra of a magnetic resonance spectroscopy (MRS) in accordance with the variance of TE and the volumes of metabolites in a localized voxel for the quality assurance using a designed single voxel spectroscopy QA phantom.

대상 및 방법 : Because a cone-shape phantom is designed as the volume of metabolite in alocalized voxel is changeable, we try to analyze the peaks of each metabolite (NAA, Cr, Cho, Lac, etc.) in accordance with metabolite volume in a localized voxel as well as echo time (TE). All data were obtained using a 3T MRI/MRS machine and analyzed using jMRUI®.

결과 : The results of this study show that TE is in inverse proportion to the noise of MRS and the longer TE and the less metabolite volume in the localized voxel, the peak intensities of each metabolite decrease. In case of the lactate, its peak was observed on the all TE only if the greatest metabolite is included in the localized voxel. Then, the intensity of a metabolite is more sensitive to the metabolite volume in the localized voxel than the TE.

결론 : These obtained in vitro MRS data is provide the guideline that is important for in vivo metabolite quantification. But, in the edge of cone-shape vial air bubbles were observed and spectrum could not obtained. Therefore our cone-shape MRS phantom needs to be modified in order to solve these problems.

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