Evaluation of T1\(\text{\textregistered}\) as a potential MR biomarker for liver cirrhosis: comparison of healthy control subjects and patients with liver cirrhosis.

The purpose of this study was to compare mean liver T1\(\text{\textregistered}\) values in patients with liver cirrhosis and healthy control subjects in order to evaluate T1\(\text{\textregistered}\) as a potential MR biomarker for liver cirrhosis. Ten healthy control subjects (mean age 42.7 years; 6 female, 4 male) and 21 patients with clinically diagnosed liver cirrhosis (mean age 56.5 years; 5 female, 16 male) were examined at 1.5 T (Magnetom Avanto, Siemens). T1\(\text{\textregistered}\)-weighted images were acquired using a 2D TurboFLASH sequence (TR/TE 3/1.31 ms, FA 8°, FoV 309 \(\times\) 380 mm, resolution 2 \(\times\) 2 \(\times\) 6 mm, acquisition time 15s, slice thickness 6mm) with spin-lock preparation. T1\(\text{\textregistered}\) maps were calculated from five breath-hold measurements, performed with different spin-lock times (4, 8, 16, 32 and 48 ms). Mean liver T1\(\text{\textregistered}\) values of healthy control subjects and patients with liver cirrhosis were calculated and compared using Student t-test. In addition, a receiver operating characteristic (ROC) curve analysis was performed to evaluate the utility of mean liver T1\(\text{\textregistered}\) values for the prediction of liver cirrhosis. Mean liver T1\(\text{\textregistered}\) values in patients with liver cirrhosis (57.4 ± 7.4 ms) were significantly higher than those of healthy subjects (47.8 ± 4.2 ms; \(p=0.0007\)). According to the ROC analysis at a threshold value of 50.1 ms the sensitivity and specificity of
mean liver T1\textsuperscript{1} in predicting liver cirrhosis were 90.5\% and 90\%, respectively. The area under the ROC curve was 0.90. Mean liver T1\textsuperscript{1} values in patients with liver cirrhosis were significantly higher than those in healthy subjects suggesting a potential role of liver T1\textsuperscript{1} as a MR biomarker for liver cirrhosis.

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