

Diagnosis of acute and chronic cholecystitis: value of contrast agent volume of the gallbladder at Gd-EOB-DTPA enhanced MRC

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PURPOSE: To evaluate the value of contrast agent volume of gallbladder (GB) to diagnose acute and chronic cholecystitis on gadolinium ethoxybenzyl diethylenetriamine pentaacetic acid (Gd-EOB-DTPA) enhanced T1-weighted magnetic resonance cholangiography (MRC).

MATERIALS AND METHODS: We retrospectively reviewed 40 consecutive patients performed Gd-EOB-DTPA enhanced T1-weighted MRC and diagnosed histopathologically as acute cholecystitis, or chronic cholecystitis from May 2009 to April 2012. Sixteen patients were diagnosed as acute cholecystitis and 24 patients were chronic cholecystitis. Forty normal healthy subjects were included in the study. The study was approved by our institutional review board. So, total 80 patients (43 men, 37 women; age range, 25–82 years; mean age, 49 years) were included. The total GB volume and the volume filled with contrast agent in GB were measured using semiautomatic method (Voxar 3D advanced visualization software, Version 6.3, Barco, Belgium) at Gd-EOB-DTPA enhanced T1-MRC obtained 60 minutes after IV injection of contrast agent. And the percentage was calculated and compared. We assessed the degree of contrast agent filling of GB between acute cholecystitis group, chronic cholecystitis group, and healthy volunteer group, using the analysis of covariance (ANCOVA) with post hoc testing of Bonferroni method. Areas under the receiver operating characteristic curve (AUC), sensitivity, and specificity were calculated and compared.

RESULTS: The average of volume percentage in acute cholecystitis group, chronic cholecystitis group, and healthy volunteer group was 8.83%, 44.35%, and 67.71% respectively. And these differences between three groups with covariable of age showed statistically significant (p -value < 0.05). ROC analysis showed the percentage cutoff of 30.45% as a reasonable predictor of acute cholecystitis (sensitivity 93.75%, specificity 97.50%, AUC 0.955). And ROC analysis showed the percentage cutoff of 43.12% as a reasonable predictor of chronic cholecystitis (sensitivity 58.33%, specificity 92.50%; AUC 0.709).

CONCLUSION: The percentage of contrast agent volume of GB can be useful for the diagnosis of acute and chronic cholecystitis on Gd-EOB-DTPA enhanced MRC.