Non-enhanced MR imaging for the pancreas and pancreatic ductal adenocarcinomas induced by N-nitrosobis(2-oxopropyl)amine in Syrian golden hamsters

Poster No.: C-0381
Congress: ECR 2011
Type: Scientific Paper
Keywords: Animal (veterinary) studies, Pancreas, Abdomen, MR, Experimental investigations, Laboratory tests, Biopsy, Neoplasia, Dissection
DOI: 10.1594/ecr2011/C-0381

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Purpose

To study the MR imaging findings of pancreas and pancreatic ductal adenocarcinomas (PDAs) induced by N-nitrosobis(2-oxopropyl)amine (BOP) in Syrian golden hamsters.

Methods and Materials

There were 101 female Syrian golden hamsters with 8-week-old and an initial average body weight of 100 g in this study. Hamsters were randomized into 3 groups, including untreated group (gr.1, n=5), saline-treated group (gr.2, n=16) and BOP-treated group (gr.3, n=80). Gr.2 and gr.3 were respectively randomized into 8 subgroups (n=2, 10, respectively). Gr.3 received weekly subcutaneously injections of BOP (10 mg/kg body weight) in 0.9% NaCl solution for 7 weeks in order to induce PDAs, while gr.2 were treadered with the same dose of 0.9% sodium chloride only. Gr.1 was used to depict the normal pancreas. All of the hamsters were performed abdominal MR imaging on 1.5T MR scanner with a dedicated animal RF-coil. The sequences included non-enhanced axial and coronal T1 and T2-weighted imaging. Terminal autopsy and histologic examination took place immediately in a random subgroup of gr.2 and gr.3, after MR imaging from 11-week after the first injection and thereafter at 2-week intervals, respectively.

Results

One or more MR examinations were performed in hamsters, respectively. On MR imaging, the normal pancreas of hamster was composed of the head of pancreas and three lobes, including gastric lobe, splenic lobe and duodenal lobe. The pancreas usually has a uniform signal intensity and a distinct margin. There were 23 and 31 BOP-induced PDAs on macroscopy and microscopy, respectively. Atypical ductal hyperplasia was found in 65 hamsters. In the 31 PDAs confirmed by histology, 15 PDAs (48.4%) were identified on MR imaging. The PDAs mainly showed respectively hypointense on T1-weighted and hyperintense on T2-weighted images with the diameter of 7.80 ± 3.19mm. The correlation coefficient between the last MRI tumor volume measurements and tumor weights was 0.95 with n =15.

Conclusion
BOP successfully induced PDAs in Syrian golden hamsters. Non-enhanced MR imaging with a dedicated animal RF-coil has an ability to depict normal pancreas as well as PDAs in Syrian golden hamsters.

References


Personal Information