

The New Liver Specific Gd-EOB-DTPA Enhancement patterns in Rabbit

Jong-Yeol Kim, Hun-Kyu Yeom, Yong-Min Chang, Sang-Gwon Lee, Duk-Sik Kang
Department of Diagnostic Radiology, Kyungpook National University Hospital

Purpose: The new hepatobiliary MRI contrast agent, Gd-EOB-DTPA, has been known to be uptaken by the hepatocytes. The liver enhancement patterns of this new compound were studied in rabbits using tissue relaxation time and time-signal density curve. The results were also compared to the enhancement patterns of the extracellular agents.

Materials and Method: Gd-EOB-DTPA was supplied as a 0.25 mol/L disodium salt solution. MRI enhancement patterns using Gd-EOB-DTPA (0.1-0.2 mmol/kg) were determined in six normal rabbits (average weight: 4 kg). A commercially available extracellular agents were used as a control. Animals were injected via ear vein. Signal enhancement over time was measured starting from just after injection to over 60 min on 1.5T GE Signa whole body scanner. For a first few minutes, contrast-enhanced dynamic MR was performed using MPSPGR pulse sequence (flip angle: 70°, TE/TR = 3.3/20 msec).

Results: In normal rabbits, 0.1 to 0.2 mmol/kg Gd-EOB-DTPA induced a significantly greater (approximately 200 %) and more prolonged liver signal enhancement (100 % at 30 minutes). This prolonged liver enhancement is due to the uptake of the agent by the hepatocytes. The measured T1 relaxation time was 57 msec. Our result also suggests that the excretion through bile in rabbit is much slower than that in the reported rat case. Based on the results from the dynamic MR study, the delayed phase, which occurs within a few minutes in case of extracellular agents, appears to have very different implications in case of liver specific agent, Gd-EOB-DTPA.

Conclusion: The Gd-EOB-DTPA shows persistent and greater liver enhancement with the uptake by the hepatocyte. This prolonged and significant enhancement may be diagnostically useful such as to identify focal mass lesions. However, the liver-specific agent enhanced dynamic MR need to be studied in more details to see the possible clinical applications.