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Question of the Day

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MR Imaging Offers Effective Tools in Diagnosing Liver Disease

A sharp needle is a blunt instrument for diagnosing fatty liver disease.

Needle biopsy of the liver has been the standard method for identifying the percentage of fat and the presence of inflammation, but the small size of the sample makes the test prone to sampling error and biopsy can't be repeated frequently due to pain and other potential complications for the patient. In separate scientific sessions on Sunday, researchers presented findings on research using MR imaging to accurately measure the percentage of fat in the entire liver and to spot inflammation that signals disease progression.

Nonalcoholic fatty liver disease is on the rise secondary to high-calorie diets and obesity, said presenter An Tang, M.D., an assistant professor of radiology at the University of Montreal in Canada.

Up to 95 percent of the obese, 90 percent of diabetics and as many as one-third of the general population have steatosis. One in 10 will go on to develop non-alcoholic steatohepatitis (NASH) and some of those will develop fibrosis, cirrhosis and even liver cancer. Accurate monitoring of the amount of fat in the liver is a key step in early diagnosis and treatment.

Dr. Tang and colleagues studied 50 patients with NASH diagnosed through biopsy. Half received colesevelam, a drug previously shown to slightly increase liver fat in NASH patients, while the other half received a placebo for 24 weeks. Both groups underwent liver MR imaging at baseline and follow-up; the exams were analyzed to measure total liver volume, total amount of liver fat and the liver fat fraction. The studies detected an increase in total liver volume, total liver fat and liver fat fraction in the test group and a slight decrease in the control group.

"To our knowledge, this is the first study that reports dynamic changes of liver volume, fat fraction, and total fat index over time," Dr. Tang said. "This is not something that could be done using traditional pathology or biochemical methods."

MR Imaging Detects Non-alcoholic Steatohepatitis

Researchers from Massachusetts General Hospital in Boston (MGH) and Harvard Medical School investigated whether myeloperoxidase gadolinium (MPO-Gd), an MR imaging probe specific for the inflammation marker MPO, can be used to



An Tang, M.D.

- [Molecular Magnetic Resonance Imaging of the Inflammatory Enzyme Myeloperoxidase Can Distinguish Steatosis from Non-Alcoholic Steatohepatitis in a Murine Model of Non-Alcoholic Fatty Liver Disease](#)
- [Longitudinal Assessment of Liver Volume, Fat Fraction and Total Fat Amount Using Magnetic Resonance Imaging in Nonalcoholic Steatohepatitis: A Randomized-Controlled Trial](#)

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detect NASH before it does permanent damage. "By the time you see cirrhosis on an MR exam, it's too late to treat it," said principal investigator, Benjamin Pulli, M.D., a radiology research fellow at MGH and Harvard Medical School. "You want to catch it much earlier." There's currently no non-invasive test for measuring liver inflammation directly.

Dr. Pulli and colleagues studied obese mice with liver steatosis. Some were fed an inflammation-inducing diet, which can trigger NASH, while the rest were fed a normal diet. MR imaging scans using MPO-Gd showed dramatic differences between those that had developed NASH and those that only had steatosis.

"Inflammation seems to be a necessary ingredient to trigger fibrosis," Dr. Pulli said. "No one knows what triggers the progression, but this might be the earliest sign of it."



Benjamin Pulli, M.D.

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