Role of MR Spectroscopy in Fatty Liver

Essay

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بسم الله الرحمن الرحيم
قَالُوا سُبْحَانَكَ لا عِلْمَ لَنَا إِلا مَا
عَلَّمْتَنَا ۖ إِنَّكَ أَنتَ الْعَلِيمُ
الْحَكِيمُ
(البقرة 32)

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LIST OF ABBREVIATIONS

CNR	**:**	Contrast to-Noise-Ratio
FLASH	**:**	Fast Low Angle Shot
IVC	**:**	Inferior Vena Cave
LHV	**:**	Left Hepatic Vein
LP	**:**	Left Portal Vein
MHV	**:**	Middle Hepatic Vein
MRI	**:**	Magnetic resonance imaging
PV	**:**	Portal Vein
RHV	**:**	Right Hepatic Vein
RPV	**:**	Right Portal Vein
SE	**:**	Spin Echo
SGE	**:**	Spoiled gradient echo
SI	**:**	Signal intensity
SNR	**:**	Signal to-Noise Ratio
SPIO	**:**	Super Paramagnetic Iron Oxide
SS	**:**	Single Shot
STIR	**:**	Short T_1 Inversion Recovery
T	**:**	Tesla
TE	**:**	Time of Echo
TR	**:**	Time of Repetition
Turbo FLASH	**:**	Turbo fast low-angle shot
USPIO	**:**	Ultra small superparamagnetic iron oxides
3D-GRE	**:**	Three Dimensional Gradient Recalled Echo
NAFLD	**:**	Non Alcholic fatty liver disease
NASH	**:**	Non Alcholic steatohepatitis

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Introduction

INTRODUCTION

Fatty liver is a common abnormality among patients undergoing cross-sectional imaging of the abdomen. The image-based diagnosis of fatty liver usually is straightforward, but fat accumulation may be manifested with unusual structural patterns that mimic neoplastic, inflammatory, or vascular conditions. , Fatty liver is a term applied to a wide spectrum of conditions characterized histologically by triglyceride accumulation within the cytoplasm of hepatocytes. The two most common conditions associated with fatty liver are alcoholic liver disease and nonalcoholic fatty liver disease. Alcoholic liver disease is caused by excess alcohol consumption, whereas the nonalcoholic variant is related to insulin resistance and the metabolic syndrome .Other relatively common conditions associated with fat accumulations in the liver include viral hepatitis and the use or overuse of certain drugs. Rarer associated conditions include dietary and nutritional abnormalities and congenital disorders. (**Wanless IR, Shiota K at 2004)**

These conditions all cause a triglyceride accumulation (steatosis) within hepatocytes by altering the hepatocellular lipid metabolism, in particular, by causing defects in free fatty acid metabolic pathways Hepatocytes in the center of the lobule (near the central vein) are particularly vulnerable to metabolic stress and tend to accumulate lipid earlier than those in the periphery Consequently, in many of these conditions, steatosis tends to be most pronounced histologically in the zone around the central veins and less pronounced in zones around the portal triads. In advanced cases, there is diffuse, relatively homogeneous involvement of the entire lobule. There. **(Venkataraman S, Braga L, Semelka RC at 2002)**

Fatty liver may be diagnosed by US if liver echogenicity exceeds that of renal cortex and spleen and there is attenuation of the ultrasound wave, loss of definition of the diaphragm, and poor delineation of the intrahepatic architecture. To avoid false-positive interpretations, fatty liver should not be considered present if only one or two of these criteria are fulfilled. by CT Fatty liver can be diagnosed if the attenuation of the liver is at least 10 HU less than that of the spleen or if the attenuation of the liver is less than 40 HU. In severe cases of fatty liver, intrahepatic vessels may appear hyperattenuated