

Rapid and Accurate Measurement of Liver Lipid and Iron Levels

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Technology description

Technical Summary

Abnormal elevation of liver lipid (fat) levels is becoming the most important liver disorder in the U.S. and in other industrialized and developing countries. Currently, the standard diagnostic tool for measuring liver lipid levels requires that patients undergo a liver biopsy. Liver biopsies are painful and associated with serious complications, such as bleeding and sometimes death, and measurements are costly and often times inaccurate. Therefore, a non-invasive and more accurate approach to assessing hepatic lipid levels is needed.

Several imaging tools have been used for the assessment of hepatic lipids; however these techniques lack the necessary accuracy and specificity to be used routinely as an alternative to current diagnostics. Dr. Diego Martin and colleagues at Emory University have developed the High Speed Multiple-Echo T2-Corrected (HISTO) Magnetic Resonance Spectroscopy (MRS) technique. This method allows for assessment of hepatic lipid and iron content within 15 seconds, and as a result of intrinsic correction methodologies, it is more accurate than previously reported non-invasive approaches. The HISTO MRS technique addresses limitations of previously proposed MR methods, which do not appropriately correct for variation between livers of different patients, and provides a more robust, reproducible, accurate and precise assessment tool. In addition, it is possible for the technique to be performed by centers that have less than optimal MR systems.

Approximately 29 million Americans have nonalcoholic fatty liver disease; the condition is observed in up to 75% of obese people.

The market for molecular spectroscopy is estimated to have reached \$3.1 billion for 2007. Overall, the total revenues for all categories of molecular spectroscopy, including MRS, grew 6.3% last year.

Application area

Simultaneous assessment of lipid and iron content of the liver.

Advantages

A non-invasive, MRS-based method for rapidly (within 15 seconds) and accurately measuring both liver lipid and iron levels simultaneously.

A technique that eliminates the need for invasive, risky and painful liver biopsies to assess hepatic lipid and iron levels.

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