



Title

Role of diffusion MR imaging in quantification of hepatic fibrosis in patients with chronic hepatitis C

العنوان

الفحص بالرنين المغناطيسي بالانتشار الموزون في تشخيص و تقييم درجة ألياف الكبد
في مرضى الالتهاب الكبدي (ج)

PI

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The contracting organization: - Faculty of Medicine, Mansoura University

Call subject category:-

HCV diagnostic modalities and related pathologies:

TC/4/Health/2010/hep-1.6: diagnostic imaging for accurate diagnosis and staging of the disease.

Project ID: 3457

Grant duration: two years

Total budget: - 1165800 LE

Abstract:

Chronic liver diseases including inflammation, fibrosis and even cirrhosis have been associated with significant morbidity and mortality of hepatocellular carcinoma. Liver biopsy is the gold standard for the examination of necroinflammation severity and liver fibrosis extent in patients with chronic hepatitis C (CHC). Liver biopsy has limitations in assessment of hepatic fibrosis and routine contrast enhanced MR imaging, perfusion MR imaging have not been sensitive for depicting minimal hepatic fibrosis. Hence studying the role of diffusion MR imaging as a diagnostic imaging for accurate diagnosis and staging of hepatic fibrosis in patients with CHC. **Objective:** To evaluate the accuracy of diffusion weighted MR imaging in diagnosis and quantification of hepatic fibrosis in patients with CHC. **Subjects and Methods:** Prospective study will be conducted upon 200 consecutive patients with chronic viral hepatitis C and 100 age matched volunteers underwent diffusion weighted MR imaging of the liver using a single shot echo planar imaging with B value = 0, 300, and 600 sec/mm². Liver biopsy will be assessed according to the METAVIR and ISHAK scoring systems. **Outcome:** evaluate noninvasive diagnostic imaging for accurate diagnosis and staging of HCV disease and will pave the way for the development of new strategies to avoid Liver biopsy limitations. **Consequences:** This research program represents an integrative approach towards accurate staging of HCV disease which is of paramount importance to evaluate the prognosis and the follow-up of the hepatic disease and to decide the need for antiviral therapy in CHC as well as potential economic revenues.

Wider objectives:

1. Evaluate noninvasive diagnostic imaging for accurate diagnosis and staging of HCV disease.
2. Avoid sampling error and observer error and risks that could be happen with liver biopsy.
3. Introduce noninvasive imaging that diagnosis and staging of HCV disease in all patients with impaired hemostasis in whom Liver biopsy cannot be performed universally.

Statement of the proposed research:

- 1- Training of the team and personnel sharing in the proposal on patient evaluation blood sampling and data collection and assessment. (3 months)
- 2- Pilot study will be conducted for validation & testing reliability of the software of diffusion MRI (3 months).
- 3- Identify the cases of our study and recruit them according to inclusion and exclusion criteria (9 months).
- 4- Collection of blood samples from patients diagnosed for testing (9 months).
- 5- Molecular quantitation of HCV RNA and laboratory assessment of our subjects (9 months)
- 6- Genotyping Assay for Hepatitis C Virus (9 months).
- 7- Sonar guided liver biopsy will be done to valid patients
- 8- histological grading and staging of hepatic fibrosis will classified according to the criteria of the METAVIR and ISHAK scoring systems (9 months).
- 9- All patients and control groups will be underwent to diffusion weighted MR imaging of the liver using a single shot echo planar imaging with B value = 0, 300, and 600 sec/mm². (12 months).
- 10- Quantitative analysis of the ADCs of hepatic parenchyma was performed by radiologist who blinded to the final diagnosis of hepatic fibrosis. (12 months)..
- 11- Collection the data comparing the diffusion MRI results with the laboratory & pathological data. (12 months).
- 12- Statistical analysis for all data and presenting them in a model. (6 months).

Subjects:

Prospective study will be conducted upon 200 consecutive patients with chronic viral hepatitis C and 100 age matched control some of them {volunteers (apparently healthy and negative virological profiles) as a donor for transplant and other will do liver biopsy for CHC treatment) and METAVIR show F0}, Will be recruited from out and inpatient clinic of tropical medicine department, Mansoura University. All patients and control group will be undergoing diffusion weighted MR imaging of the liver using a single shot echo planar imaging with B value = 0, 300, and 600 sec/mm². Liver biopsy will be obtained with calculation of METAVIR score. The ADC (value is a quantitative parameter that used to measure diffusion value of the liver) will be correlated with METAVIR, ISHAK score. Receiver operating characteristic curve will done for diagnosis and grading of hepatic fibrosis. Informed consent will be obtained from the patients and volunteers.

Inclusion criteria:

- 1- HCV positive by PCR
- 2- Adults (above 18 years) of both sexes.
- 3- The biopsy was performed more than 15 days and less than 2 months prior to the MR imaging, to avoid artifacts related to early post biopsy changes

Exclusion criteria:

1. Patients co-infected with HIV or HBV (HBV core antibodies).
2. Patient with anti-HCV antibodies positive and no detectable PCR-HCV in the serum.
- 3-Patients with current or previous history of decompensated events (variceal hemorrhage and hepatic encephalopathy),
- 4- Other causes of chronic or metabolic liver diseases (such as Autoimmune, Wilson disease, Gauchers disease).

Team Responsible to Complete the Project

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