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Histomorphometric findings may help predict response to antiviral therapy at an Early fibrosis grade in patients with Chronic HCV infection

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Introduction: HCV is a leading cause of cirrhosis and hepatocellular carcinoma and is the leading indication for liver transplantation in the United States. In the United States, genotype 1 is the most predominant, especially in HIV-HCV co-infected and the African-American population. Several viral and host factors related to viral response have been reported. Histomorphometry is a quantitative method for investigating changes in shape, size and orientation of cells in tissues. Morphometry has been used in various fields, to predict disease phenotype and patients prognosis.

Aim: To use computerized histomorophometry in order to quantify the histological changes that occur in liver biopsies obtained from patients with chronic HCV, in the purpose of predicting the response to medical treatment in these patients.

Methods: Patients with chronic HCV genotype 1, with Metavir score F1 and F2 followed at our liver unit have been selected and grouped according to treatment response {SVR (sustained viral response) and non-SVR} into 30 patients per group. Histolomorphometric analysis has been blinded to patient identification or previous histological information. Histological slides from the pretreated liver biopsies were scanned using the dot slide virtual microscopy (Olympus) system. 3-4 representative images were captured per slide. Each liver biopsy contained 6-8 representative portal spaces in average. The ImagePro plus 7.0 (Mediacybernetics USA) program has been used to quantify the amount of collagen fibers, the number of inflammatory cells and textural changes of the livers parenchyma. The Matlab software (Mathworks, USA) was used to calculate fractal and lacunar dimensions of the liver parenchyma in order to capture any structural changes in the liversgeneral architecture.

Results: Histomorphometric variables including the density of collagen fibers, the fraction of inflammatory cells per portal space area, and textural parameters were found to be statistically significant and could be combined together in a mathematical formula, in order to predict response to treatment in HCV patients, with sensitivity of 93%, and 100% specificity.

Conclusions: Our study indicates that computerized histomorphometry can be used to quantify the level of fibrosis, amount of inflammation, and the changes in the parenchymal texture and complexity in chronic HCV patients. Histomorphometric method is promising and may contribute to developing a novel expert guided automatic system predicting response to treatment in chronic HCV patients, already at an early stage when histological changes are minimal, which may affect choosing suitable treatment for each patient. Morphometry may be used in the future to investigate liver diseases due to different etiologies.

Biography

Maison Abu Raya has completed her MD (cum laude) and graduated at the age of 26 from the Technion Institute of Technology, Rappaport Faculty of medicine, Haifa, Israel, one of the prestigious medicine schools in Israel.

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