The severity of steatosis does not influence liver stiffness measurements in patients with Non-Alcoholic Fatty Liver Disease

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Background and Aims: Non-invasive characterization of hepatic steatosis and fibrosis based on Fibroscan elastography and controlled attenuation parameter (CAP) is used widely for the diagnosis and follow up of patients with NAFLD. However, to date, the validation of non invasive markers is based in semi-quantitative scoring of steatosis and fibrosis in liver biopsies.

The aim of this study was to assess whether the degree of steatosis as determined by CAP and the degree of fibrosis by liver stiffness measurements correlate with the fat and collagen quantitation respectively in liver biopsies of patients with NAFLD.

Methods: 80 consecutive patients with biopsy confirmed NAFLD and transient elastography with CAP score within 3 months of the biopsy date were prospectively evaluated. Twenty liver biopsies with steatosis<5% were used as controls. Biopsies were digitalized at 2x magnification and then analysed by our automated software, which processes the images in two stages: Machine learning clustering and Morphological Image Processing. Fat and fibrosis quantitation were expressed as percentages of the relative areas of fat and collagen respectively and of tissue.

Results: Correlation between CAP score and fat% was statistically significant (p =0.002, Rho=0.45) only in identifying fat but not distinguishing between stages of steatosis. Regression analysis revealed an R^2=0.206 (figure 1a). The AUROC for identifying fat>5% was 0.82(p=0.001, 95%CI=0.71-0.92) with the best cutoff at 250dB/m (95% sens, 60% specificity). Correlation between liver stiffness and fibrosis quantitation (%) was statistically significant (p <0.001, Rho=0.802) with an R^2 of 0.679 (figure 1b).

When our cohort was split to those with fat% ≤ 10% and >10% in the liver biopsies there was no difference between liver stiffness and fibrosis quantitation in Pearson’s correlation: Rho=0.883 and Rho=0.843 respectively (figure 2).

Conclusions: Liver stiffness is a reliable noninvasive tool for estimating the severity of fibrosis in NAFLD. The presence of severe steatosis evaluated by fat quantitation in liver biopsies did not influence liver stiffness measurements.

Figure:
Disclosure of Interest: None Declared