**Extended Abstract**
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# Liver stiffness predicts relapse after Direct acting antiviral therapy against chronic Hepatitis C Virus infection

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## Abstract

Background & study aim: Assessment of fibrosis in chronic hepatitis has always been considered of utmost relevance for patient care in clinical hepatology. Over the last years, multiple non-invasive methods were used for diagnosis of hepaic fibrosis, including transient Elastography additionally to clinical and biochemical parameters or combinations of both methods. Serum markers and elastography are considered useful techniques for diagnosing severe liver fibrosis and cirrhosis and for excluding significant fibrosis in hepatitis C virus infected patients. Also, liver stiffness may help to foretell treatment response to antiviral therapy. We aimed to judge changes of Transient elastography values further as serum fibronectin and AST to platelet ratio index in patients (APRI) treated with sofosbuvir- based treatment regimen. Methods: this can be a follow-up study including 100 chronic HCV Egyptian patients treated with Sofosbuvir-based treatment regimen.

Transient elastography values were recorded still as serum fibronectin and APRI were calculated at baseline and SVR12. Results: There was a big improvement of platelets counts, ALT and AST levels, which successively cause significant improvement in APRI scores at SVR12. Liver stiffness measurements were significantly lower at SVR12 (15.40 8.96 vs 8.82 4.74 kPa, P =0.000). There was significant decline in serum fibronectin from baseline to SVR 12 (524.14 237.61 vs 287.48 137.67, P=0.000). Key words: hepatitis C Virus, Liver stiffness, Transient Elastography and Fibronectin. Conclusion: Non-pegylated interferon (IFN) or pegylated IFN (PEG-IFN) together with ribavirin (RBV) were the most drugs used for the management of HCV infection . the employment of the first-generation direct acting antivirals (DAAs) boceprevir and telaprevir with PEG-IFN and RBV increased the general SVR rates to 68%-75% for naive patients and to 59%-88% for treatment-experienced patients, whether or not these regimens were used just for the treatment of genotype 1 HCV infection . Despite the positive effect of HCV infection eradication on patients??? prognosis, few data about liver cirrhosis/fibrosis regression are accessible. Liver fibrosis regression as a consequence of viral eradication is supported by the reduction of inflammatory mediators that results in apoptosis of myofibroblasts, and occurs by the inactivation of stellate cells. The downregulation of inflammation, moreover as hepatocyte regeneration, microvascular remodeling and degradation of extracellular matrix result in the generation of recent hepatic tissue. Our study showed improvement of liver stiffness measurements 12 weeks after end of treatment still as significant improvement in AST, ALT and platelets count with subsequent improvement of APRI score which signifies notable improvement of hepatic necroinflammation and fibrosis following antiviral treatment. This study showed significant improvement in serum fibronectin levels after antiviral treatment with statistically significant difference in SVR12 patients.We also found that every of ALT, AST and baseline liver status (cirrhotic or noncirrhotic) can predict relapse in HCV treated patients.

As compared to pre-treatment values, SVR12 LS scores are significantly reduced which reflects improved liver fibrosis parameters with available DAAs. Also, high LS measurements before treatment is a predictor of relapse and then LS are often accustomed guide treatment duration by prolonging duration of treatment but more trials are needed Fibrosis staging is very important in CHC patients, as fibrosis stage could be a strong predictor of complications and mortality. Historically, liver biopsy has been the strategy of choice because it brings insight into the precise structure of the liver and yields information on inflammation and fibrosis similarly as potential differential diagnoses. Liver histology from CHC patients covers a good spectrum of abnormalities, from acute inflammation to lasting structural changes, often together. Moreover, a liver biopsy is also wont to assess fibrosis progression over time. However, the biopsy represents alittle portion of the liver, which can be heterogeneous. Some studies have shown sampling error in up to 30% of biopsies, with adequate biopsy length being of primary importance[80]. Liver biopsy may further be limited by inter- and intraobserver variation in histological assessment; is invasive, with alittle but significant risk of complications (e.g., pain, bleeding, and even mortality); and is disliked by many patients, which limits its use in follow-up studies. the shortage of histological verification of structural liver changes is one in all the most important limitations in many

studies. Due to the constraints of liver biopsy, noninvasive methods for grading and staging liver inflammation and fibrosis became increasingly sought and used. Noninvasive methods include biomarkers and imaging techniques, many of which were developed and validated in CHC patients. The biomarkers include scores like the aspartate aminotransferase-to-platelet ratio index (APRI) supported aspartate transaminase (AST) and platelets[83]; the fibrosis-4 (FIB-4) index supported age, AST, alanine transaminase (ALT), and platelets; the improved liver fibrosis test; and also the FibroTest[86], which have all been extensively investigated in CHC patients, yielding “good or decent” prediction of fibrosis and particularly cirrhosis. additionally, the APRI and FIB-4 predict HCV liver-related death[93]. The major quality of noninvasive fibrosis assessment inherently lies within the term noninvasive. additionally, the methods overall have practical advantages, including high applicability and good reproducibility and availability.

However, the methods even have several limitations. The performance of noninvasive methods to diagnose fibrosis or cirrhosis will depend upon the prevalence of the disease stage within the cohort. this is often referred to as spectrum bias and is very relevant when comparing methods between cohorts. additionally, the utilization of noninvasive methods is also limited because most aren't liver specific, and should be influenced by other factors Currently, the simplest validated method in CHC patients is TE using the FibroScan device. Several studies have shown good concordance between liver stiffness by FibroScan and histological stage, with good reproducibility, especially in patients with higher stages of fibrosis The ARFI method is becoming widely used and is in good agreement with liver histology in CHC patients.

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