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Application of LIVERFASt biomarkers to evaluate longitudinal hepatic fibrosis and inflammation after HCV cure

Mati Ullah Dad Ullah[1], Arjun P. Kelaiya[1], Rohullah Rasikh[1], Medhi Sakka[2], Rana Alkouri[2], Mukarram Jamat Ali[1], Hao Wei Chen[1], Iman Waheed Khan[1], Mina Choudhry[1], Muhammad Ashar Ali[1], Maxime Deregnaucourt[2], Dominique Bonnefont-Rousselot[2,3], Mona Munteanu[4], Ronald Quiambao[4] and Daryl T. Y. Lau[1]

1 Beth Israel Deaconess Medical Center, Harvard Medical School, USA, 2 Metabolic Biochemistry Department, Pitié-Salpêtrière Hospital, Public Assistance Paris Hospitals,Aphp Sorbonne University, France, 3 Pharmacy Training and Research Unit (UFR), Paris Cité University; Cnrs, Inserm, Utcbs, France, 4 Fibronostics US Inc, USA

INTRODUCTION

- Hepatitis C virus (HCV) infection is a common cause of both liver cirrhosis and hepatocellular carcinoma
- Successful Direct antiviral agents (DAA) therapy is associated with >95% sustained virological response
- Although the goal of HCV treatment is to achieve SVR, patients with advanced fibrosis and cirrhosis still have a high risk of developing HCC
- It is important to identify patients who are at risk for liver disease complications after achieving SVR

AIMS

- To evaluate the prognostic values of LIVERFASt as a noninvasive biomarker in evaluating changes in fibrosis and inflammation post-DAA therapy
- To identify risks associated with HCC and liver disease progression after HCV cure post-DAA

METHOD

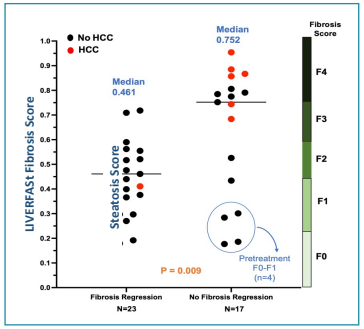
- Retrospective cohort study in a single tertiary liver center
- Patients achieved DAA-induced HCV cure with follow-up >1 year who had pretreatment and follow-up sera in the biorepository were included
- Medical record review was performed to record HCC, hepatic decompensations, and comorbid conditions
- APRI and FIB-4 scores were calculated and correlated with the LIVERFASt Fibrosis scores at baseline.
- LIVERFASt™ is a blood-based diagnostic test that combines 10 biomarkers and algorithm technology to determine the fibrosis, inflammatory activity, and steatosis of the liver.

Required Biomarkers of LIVERFASt

Biomarkers in SI units	Fibrosis Test	Activity Test	Steatosis test
		Quantitative scores (0-1)	
Age, yrs	x	x	x
Gender	x	x	x
BMI, kg/m²			x
Alpha2-macroglobulin, g/l	x	x	x
Haptoglobin, g/l	x	x	x
Apolipoprotein A1, g/l	x	x	x
Total bilirubin	x	x	x
Gamma glutamyl transpeptidases (GGT), IU/l	x	x	x
Alanine aminotransferases (ALT), IU/l		x	x
Triglycerides, mmol/l			x
Fasting glucose, mmol/l			x
Total Cholesterol, mmol/l			x
Aspartate aminotransferases (AST), IU/l			x

RESULTS

- A total of 40 patients with a post-DAA follow-up period of 37 (17- 62) months were included in the analysis
- **Gender:** Male (62%); Female (38%)
- **Race**: White (65%), African American (22.5%), Asians (7.5%), Hispanic (2.5%), unknown (2.5%)
- **Age:** 58 (33-78) years
- **HCV Genotype:**
- 1a 20 (50%), 1b 10 (25%)
- **Pretreatment Stage 3-4 fibrosis:** 34 (85%)



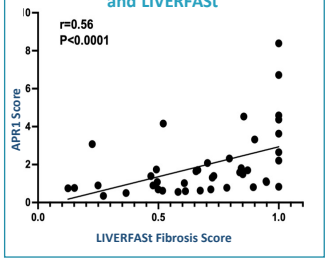
Hepatic fibrosis changes post-DAA

- At follow-up: 23 (58%) had ≥ 1 stage fibrosis regression
- 3 (7.5%) had progression of fibrosis
- 14 (35%) had no changes; 4 had F0-F1 at baseline

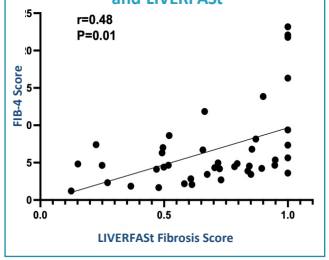
HCC post-DAA

- 9 developed HCC between 2.1 and 5.8 years after HCV cure, and 8 had advanced fibrosis prior to DAA.
- 5 (56%) had unchanged F3-4 stage
- 1 (11%) progressed from F2 to F4 fibrosis and had active inflammation
- 3 (33%) had fibrosis regression. All had a history of hepatic decompensation prior to DAA

Correlation of pretreatment APR1 and LIVERFASt



Correlation of pretreatment FIB-4 and LIVERFASt



Hepatic inflammation changes post-DAA

At baseline, 16(70%) and 8(47%) patients with and without subsequent fibrosis regression had inflammation Activity score ≥1 grade, respectively (p=0.15)

At follow-up:

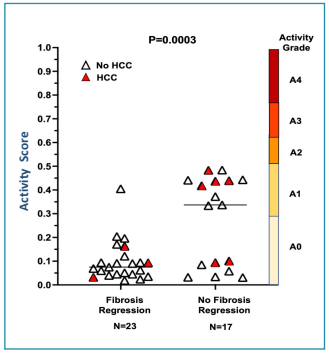
- 22 (96%) with fibrosis regression had grade 0 Activity
- 10 (59%) with no fibrosis regression had grade ≥1 activity

Active inflammation post-DAA

HCC: 4 (44%) had Activity score ≥ 1

No HCC:

- 6 (55%) without fibrosis regression had Activity score ≥ 1
- 2 had active alcohol use; one progressed to F4
- 1 ANA(+) autoimmune hepatitis
- 2 had portal hypertension, and one also had BMI>30
- 1 No obvious comorbid condition



CONCLUSIONS

- LIVERFASt has prognostic values by monitoring changes in hepatic fibrosis and inflammation after HCV cure
- Patients with advanced fibrosis and hepatic decompensation remain at high risk for HCC after HCV cure and require ongoing HCC Surveillance
- Patients with persistent hepatic inflammation despite SVR are at risk for liver disease progression and complications
- Other causes of liver disease must be evaluated for patients with hepatic inflammation or progressive fibrosis after HCV cure

FIBRONOSTICS