

Application of LIVERFAST to Predict Steatosis in Chronic Hepatitis B Patients with Metabolic Syndrome

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INTRODUCTION

- Chronic hepatitis B (CHB) and non-alcoholic fatty liver disease (NAFLD) are both common liver conditions
- 30 - 40% of CHB patients also have NAFLD which are associated with high prevalence of type 2 diabetes and metabolic syndrome
- Patients with both CHB and NAFLD have increased risk of advanced hepatic fibrosis and hepatocellular carcinoma
- It is important to identify CHB patients who have co-existing NAFLD without a liver biopsy

AIMS

- To evaluate the prognostic values of LIVERFAST as a noninvasive biomarker in detecting hepatic steatosis in chronic hepatitis B
- To correlate LIVERFAST steatosis with Fibroscan Controlled Attenuation Parameter (CAP) scores

METHOD

- Retrospective study in a single tertiary Liver Center
- Based on the availability of fasting sera, we identified 2 groups:
 - Chronic hepatitis B with metabolic syndrome (MS-HBV)
 - Chronic hepatitis B alone as controls (C-HBV)
- LIVERFAST™ scores were computed for each sample
- Medical record review was performed to record demographics, clinical and HBV status of patients

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/m ²	x	x	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

Demographics and clinical characteristics

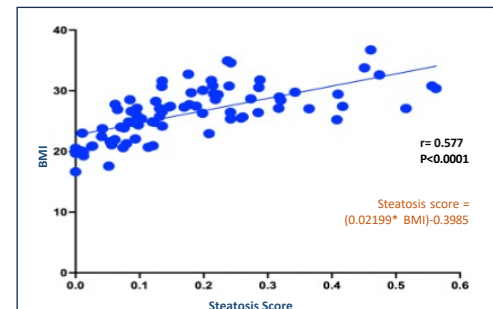
	MS-HBV N=36	MS-HBV N=36	P value
Age (years)	50 (24-72)	46 (25-63)	0.17
Gender (M:F)	24:12	22:24	0.08
Asian (%)	30 (83%)	31 (67%)	0.1
BMI (kg/m ²)	28 (23-37)	25 (16-35)	0.001
ALT (U/L)	42 (14-155)	27 (4-92)	0.002
AST (U/L)	30 (18-54)	25 (12-60)	0.01
HbA1c (%)	6.1 (5.1-8.4)	5.2 (4.1-5.8)	<0.0001
HBV DNA >2000IU/ml n(%)	5 (14%)	7 (15%)	NS
HBV antiviral n(%)	15 (42%)	17 (37%)	NS

Correlation between LIVERFAST Steatosis scores and clinical parameters

Clinical Parameters	Correlation	P value
Steatosis score vs BMI	r = 0.577	<0.00001
Steatosis score vs HbA1c %	r = 0.319	0.0035
Steatosis score vs Fibrosis score*	r = 0.058	0.80

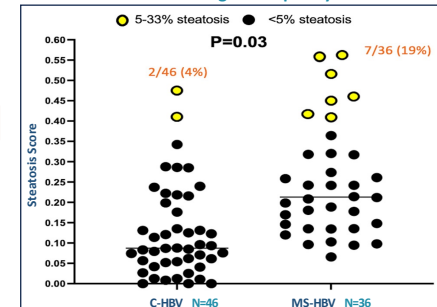
* Only 4 (11%) and 2 (4%) of MS-HBV and C-HBV had Fibrosis ≥ F2, respectively
All the patients in this cohort had A0 Activity score

Linear regression model of LIVERFAST Steatosis scores and BMI



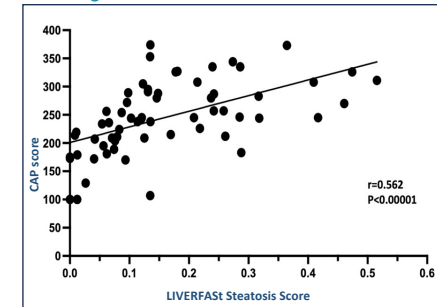
RESULT

Higher frequency of steatosis among MS-HBV



- The proportions of patients on antiviral therapy for CHB were similar
- 19% in MS-HBV and only 4% in C-HBV were identified to have steatosis

Significant correlation between CAP and LIVERFAST steatosis scores



- 54 (66%) patients had Fibroscan with CAP within 2 years of LIVERFAST test.
- Patients with changes in BMI >2 were excluded in this correlation analysis

CONCLUSIONS

- LIVERFAST has prognostic values in detecting steatosis among CHB patients with metabolic syndrome
- There are significant correlations between the LIVERFAST steatosis score with BMI and CAP score (Fibroscan)
- These positive observations need to be validated with a more racially diverse, larger cohorts.