Abstract Category: Diagnostic procedures NASH / liver fibrosis

Abstract Title: "A Disease Severity Index (DSI) from the HepQuant®-SHUNT Test is Reproducible and Quantifies Hepatic Impairment in Patients with Non-Alcoholic SteatoHepatitis (NASH), Chronic Hepatitis C (CHC), and Primary Sclerosing Cholangitis (PSC)"

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Background/Aim: The dual cholate test (HepQuant®-SHUNT) yields a disease severity index, DSI, that quantifies global liver function and physiology. Herein, we define the performance and reproducibility of DSI across a spectrum of chronic liver diseases, including Non-Alcoholic SteatoHepatitis (NASH), Chronic Hepatitis C (CHC), and Primary Sclerosing Cholangitis (PSC).

Patients: 16 healthy controls, 16 patients with CHC (8 with METAVIR fibrosis stage F0 to F2, 8 with F3 or F4), 16 patients with NASH (8 with BRUNT/KLEINER fibrosis stage F0 to F2, 8 with F3 or F4), and 46 patients with a wide clinical spectrum of PSC were studied. CHC and NASH patients with cirrhosis had compensated disease.

Methods: Controls, HCV, and NASH cases were tested 3 times, and PSC cases twice. Hepatic filtration rates (HFRs) were defined from clearances of cholic acid-24-13C, 20 mg intravenously (systemic), and cholic acid-2,2,4,4-d4, 40 mg orally (portal). Clearances were calculated from labeled cholate serum concentrations at baseline and 5, 20, 45, 60, and 90 minutes after simultaneous IV cholic acid-24-13C and oral cholic acid-2,2,4,4-d4 administration. DSI was calculated from HFRs:
$DSI = 10.86 \times SQRT\ [(Log_e\ 51.69 - Log_e\ Portal\ HFR)^2 + (Log_e\ 10.72 - Log_e\ Systemic\ HFR)^2]$

Results: The means ± SDs of DSIs for NASH (16.8 ± 3.4), HCV (18.9 ± 6.0), and PSC (18.2 ± 7.4) were higher than for controls (9.8 ± 3.3) ($p < 0.001$) and correlated with fibrosis stage in NASH and HCV. The average deviation from the mean of replicates was 0.94 ± 0.86 DSI units. Intra-class correlations for DSI were > 0.90.

Conclusion, DSI quantifies hepatic impairment and is reproducible over a broad spectrum of etiologies of liver disease, stages of fibrosis, and clinical severity. The minimally invasive HepQuant®- SHUNT test could be useful for defining severity and monitoring progression of chronic liver diseases, including Non-Alcoholic SteatoHepatitis (NASH), Chronic Hepatitis C (CHC), and Primary Sclerosing Cholangitis (PSC).