

Abstract #LB65

Non-invasive Measurement of the Portal Circulation Using Cholates Quantifies Disease Severity in Waiting List Patients with Primary Sclerosing Cholangitis

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Purpose: MELD may not adequately assess disease severity in listed Primary Sclerosing Cholangitis (PSC) patients compared to dual cholate clearances which quantify the portal circulation.

Methods: 38 PSC patients were studied and 10 were listed for liver transplant (LT). The clearance of IV cholate-24-13C defined the Systemic Hepatic Filtration Rate (HFR). The clearance of oral cholate-2,2,4,4-d4, which is taken up into the portal circulation, defined the Portal HFR. The ratio of Systemic to Portal HFR defined portal-systemic SHUNT. PSC patients had significantly lower Portal HFR and higher SHUNT relative to healthy controls, whose values were established in earlier studies (Table 1). Listed PSC patients had significantly lower Portal HFR and higher SHUNT and MELD relative to those not listed. Within the listed group, those with varices had significantly lower Portal and Systemic HFRs, and higher SHUNT relative to those without varices while their mean MELD score was insignificantly higher. Two of the varices patients received LTs. Patient A had a MELD of only 20 but exhibited the lowest Portal and

| Table 1 | n | SHUNT (%) | t-test P-value | Portal HFR (mL/min/kg) | t-test P-value | Systemic HFR (mL/min/kg) | t-test P-value | MELD score | t-test P-value |
|-------------------------|----|-----------|----------------|------------------------|----------------|--------------------------|----------------|------------|----------------|
| Healthy Controls | 32 | 19 ± 1 | | 30.1 ± 1.7 | | 5.7 ± 0.4 | | | |
| PSC Patients | 38 | 44 ± 3 | <0.001 | 14.2 ± 1.1 | <0.001 | 5.2 ± 0.3 | ns | 8.9 ± 0.5 | |
| PSC not listed for Tx | 28 | 39 ± 3 | | 15.5 ± 1.2 | | 5.3 ± 0.3 | | 7.9 ± 0.4 | |
| Listed PSC | 10 | 56 ± 7 | <0.001 | 10.6 ± 2.0 | <0.03 | 4.8 ± 0.6 | ns | 11.4 ± 1.4 | <0.004 |
| Listed PSC w/o Varices | 5 | 41 ± 6 | | 15.7 ± 1.5 | | 6.1 ± 0.6 | | 9.0 ± 1.1 | |
| Listed PSC w Varices | 5 | 71 ± 8 | <0.02 | 5.4 ± 1.4 | <0.002 | 3.5 ± 0.6 | <0.02 | 13.8 ± 2.1 | ns |
| Patient A Tx for decomp | 1 | 78 | | 2.5 | | 1.9 | | 20 | |
| Patient B Live Donor Tx | 1 | 89 | | 5.5 | | 4.9 | | 17 | |

Systemic HFRs measured and experienced rapid liver failure. Patient B had a MELD of only 17 but had the highest SHUNT measured and received a live donor transplant.

Values are mean ± SEM. P values are relative to group in previous row.

Conclusion: Portal and Systemic HFRs and SHUNT differentiate PSC patients from healthy controls; listed PSC patients from those not listed for LT; and listed patients with varices from those without varices. The results with varices and the 2 LT patients suggest that cholate testing may be superior to MELD in defining disease severity and priority for LT in PSC.