Hepatic functional deterioration after locoregional therapy (LRT) for hepatocellular carcinoma (HCC) measured by hepatic cholate clearance: a pilot study

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Background

- Locoregional Therapy (LRT) is the treatment of choice for Hepatocellular Carcinoma (HCC) when limited to the liver, but is associated with a risk of liver toxicity
- Using clinically available measures of liver function, an upper limit of liver dysfunction that allows the safe administration of LRT is not well defined
- The dual cholate clearance assay (HepQuant-SHUNT®) measures the hepatic clearance rate of 99mTc labelled cholate administered orally, and 14C labelled cholate administered intravenously. A liver disease severity index (DSI) is derived from a combination of oral and IV clearance parameters [1]
- The primary objective of our pilot study is to evaluate the effect of LRT for HCC on hepatic cholate clearance parameters
- The secondary objective is to determine whether baseline cholate clearance parameters correlate with subsequent development of liver toxicity

Methods

- Patients with HCC limited to the liver, without vascular invasion, who are scheduled for LRT at the University of Pennsylvania were recruited
- The dual cholate clearance assay (HepQuant-SHUNT®) was administered as previously described [1], at baseline (T0) before LRT, and 4-10 weeks after LRT (T1)
- Clinical and laboratory assessment of liver function was obtained at baseline (T0), at 4-10 weeks after LRT (T1), and at 12-18 weeks after LRT (T2)
- Clinically significant liver toxicity was defined as the development of a new complication of liver disease, or an increase in Child-Turcotte-Pugh (CTP) score by 2 or more points
- The Wilcoxon signed rank test was used to compare parameters before and after LRT

Results

- Eleven patients were recruited and completed the baseline evaluation
- Two patients did not have complete data from the post LRT HepQuant-SHUNT® for technical reasons (inability to obtain IV access in one case, no detectable 99mTc cholate in another)
- Complete per protocol assessment was available in 9 patients
- All but one of the 9 patients (89%) who had a complete evaluation had worse DSI after LDT
- Only 4/9 (44%) had an increase in CP score, and 5/9 (56%) had an increase in MELD or MELD-Na scores

Discussion

- The HepQuant-SHUNT® assay appears to detect a deterioration in hepatic function of patients treated with LDT at 4-10 weeks after treatment. One patient was an outlier in that trend.
- DSI>35 might be a cutoff for risk of clinical decompensation after LRT for HCC, as it appears to perform better than clinical parameters in this pilot study.
- Additional research is needed to evaluate the role of the HepQuant SHUNT® test in improving the selection of Child B patients for LRT.

Reference