

Use of a Metabolomic Approach to Non-Invasively Diagnose Nonalcoholic Fatty Liver Disease (NAFLD) in Patients with Type 2 Diabetes Mellitus (T2DM)

Background

- Nonalcoholic fatty liver disease (NAFLD) is associated with the epidemics of obesity, type 2 diabetes mellitus (T2DM), and metabolic syndrome.^{1,2}
- NAFLD can progress to nonalcoholic steatohepatitis (NASH), advanced fibrosis, and even hepatocellular carcinoma.^{1,2} It can be difficult to classify, especially in a noninvasive manner.
- Several clinical/metabolic scores have been developed to help assess NAFLD, but they were developed in patients without T2DM and have not been validated in patients with T2DM.
- **Objective:** The investigators evaluated whether metabolomic scores can be applied to patients with T2DM to classify NAFLD.

Methods

- Patients with T2DM (n=220) were recruited in Gainesville, Florida, and San Antonio, Texas, as well as from state university clinics.
- Intrahepatic triglyceride content was measured by proton magnetic resonance spectroscopy (¹H-MRS) and insulin resistance was measured by an oral glucose tolerance test. For patients who were diagnosed with NAFLD based on ¹H-MRS, a percutaneous liver biopsy was offered to determine the stage of the disease.
- To determine metabolomic scores, serum specimens were provided to OWL Metabolomics for measurements with the OWLiver® Care and OWLiver tests.
- Scores were evaluated for concordance with biopsy results.

Results

- For the overall cohort of T2DM patients, the OWLiver Care and OWLiver test results had suboptimal performance for detection of biopsy-proven NASH (AUROCs <0.70). This result was inconsistent with previous studies that included mostly Caucasian, nondiabetic patients.
- Because the population in this study was heterogeneous, investigators examined the effects of patient characteristics on test performance. No differences in performance were observed based on age (>65 vs <65 years old), sex, ethnicity (Caucasian vs Hispanic vs other ethnicity), or diabetes control (with or without).
- The investigators found that test performance did improve in subsets of patients that mirrored those used to develop the OWLiver models (ie, European, Caucasian, without T2DM).
 - Patients with good glycemic control (HbA1c<7.0%) and without cirrhosis: AUROC=0.79 (0.68–0.90)
 - Patients with lower insulin resistance and without cirrhosis: AUROC=0.87 (0.76–0.97)

Conclusions

- Metabolomic scores developed for identifying NAFLD and NASH in patients without T2DM cannot be applied to those with T2DM.
- A diabetes-specific, non-invasive test is still needed for patients with T2DM.

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References

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2. Pappachan JM, Babu S, Krishnan B, et al. *J Clin Transl Hepatol.* 2017;5:384–393.