

# Smartphone app found to be valid tool in screening for minimal hepatic encephalopathy

18 September 2013

A smartphone app can quickly screen for cognitive dysfunction often found in patients with cirrhosis, according to a new Virginia Commonwealth University study. The cognitive dysfunction, known as minimal hepatic encephalopathy (MHE), has been difficult to diagnose.

Published in the September issue of the journal *Hepatology*, the study tested the validity of the Stroop smartphone application – called EncephalApp\_Stroop – as a method to screen for MHE.

Validation of the [app](#) as a health care tool opens the door for its use as a point-of-care (POC) instrument that providers can use to quickly, easily and confidently evaluate their patients who may be suffering from MHE.

"This app can be used to rapidly select which patients are likely to benefit from further MHE testing and potential treatment, which has been lacking at this time." said principal investigator Jasmohan Bajaj, M.D., associate professor, Department of Gastroenterology, Hepatology and Nutrition, VCU School of Medicine, who practices at VCU and McGuire VA Medical Centers. "It can be translated into practice by clinic assistants, nurses or other non-MD professionals to add a cost-effective approach to the rapid diagnosis of MHE."

MHE is associated with impaired quality of life, employment and driving capability and a higher risk of progression to overt hepatic encephalopathy, but treatment has not been standard of care in the U.S. partly because MHE testing is not feasible.

The free EncephalApp\_Stroop app, which Bajaj developed, utilizes the Stroop task, which is used

to evaluate psychomotor speed and [cognitive flexibility](#) through identification in various combinations of ink colors and words.

To determine the validity of the app as a health care tool, Bajaj and his team recruited 126 patients with [cirrhosis](#), some of whom had overt [hepatic encephalopathy](#), 51 age-balanced health controls and 43 additional patients with cirrhosis for the prospective validation cohort. They underwent a battery of recommended cognitive tests including the traditional MHE test and the Stroop app evaluation.

The team concluded that the Stroop app is a valid, reliable method for screening for MHE. Use of the app may improve the screening process by making it easier and faster and, subsequently, increase treatment rates in potential [patients](#) with MHE.

They suggest further studies evaluating the app's validity in other populations are needed.

The app can be downloaded on iTunes for iPhones or iPads and is available in Spanish, Czech, Slovak and Indonesian languages.

Provided by Virginia Commonwealth University

APA citation: Smartphone app found to be valid tool in screening for minimal hepatic encephalopathy (2013, September 18) retrieved 13 August 2022 from <https://medicalxpress.com/news/2013-09-smartphone-app-valid-tool-screening.html>

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