Is Brain Dysfunction Reversible?

Did you know that the health of your liver significantly impacts your brain function?

The liver filters brain toxins like alcohol, ammonia, and drug metabolites from the blood. The connection between these two vital organs is so essential that severe liver illness can cause a life-threatening brain dysfunction called hepatic encephalopathy (HE). According to the National Institutes of Health (NIH), approximately 7 to 11 million people in the U.S. live with HE.

Who’s at risk for hepatic encephalopathy?

The biggest risk factor for developing hepatic encephalopathy? Acute liver failure, or chronic liver disease like acute liver failure or advanced cirrhosis of the liver. Researchers at the NIH report that approximately 1 in 400 people in the U.S. have cirrhosis and 30 to 45% of HE patients have cirrhosis.

Cases of hepatic encephalopathy related to alcohol consumption and fatty liver diseases are on the rise, says Kalyan Ram Bhamidimarri, M.D., a hepatology expert at the University of Miami Health System. Researchers recently published a study of patients with newly diagnosed cirrhosis. They found a significant increase each year in the proportions of patients with alcoholic cirrhosis, including an increase in those younger than age 40 and older than 65.
If heavy drinkers don’t quit, alcoholic liver disease can progress from fatty liver (steatosis) to alcoholic hepatitis, alcohol-related cirrhosis, and life-threatening hepatic encephalopathy.

Symptoms of hepatic encephalopathy

Because the symptoms of liver disease can manifest slowly over time, patients tend to put off seeing a doctor until serious complications like HE develop. “Therefore, the key is early diagnosis and treatment of the liver disease,” Dr. Bhamidimarri says. “Early intervention can halt the progression of liver disease and prevent future complications like HE.”

The stages of hepatic encephalopathy

Stage 0

“This stage is hard to diagnose,” says Dr. Bhamidimarri. “Patients typically show no symptoms at all.”

Stage 1

This stage is also hard to diagnose, Dr. Bhamidimarri says. “Patients may show minimal, but no overt symptoms.”

Mild symptoms may include:

- inverted sleep-wake pattern (sleeping during the day, awake all night)
- shortened attention span
- confusion
- lethargy
- personality changes
Stage 2

“Patients in this stage show moderate symptoms,” Dr. Bhamidimarri says. “They are alert and responsive but are disoriented to person, time, and/or place.”

Moderate symptoms include:

- asterixis (hand tremor that may be present without cognitive issues)
- disorientation
- lethargy
- difficulty thinking
- personality changes
- poor concentration
- problems with handwriting
- loss of small hand movements
- confusion
- forgetfulness
- poor judgment

Stage 3

“For patients in this stage, hospitalization is usually required. They show significant symptoms,” says Dr. Bhamidimarri. “Patients are usually somnolent (sleepy) or may be grossly confused (stupor).”

Severe symptoms include:

- inability to perform basic tasks
- confusion
- personality changes
- drowsiness or lethargy
- anxiety
- seizures
- rigidity
- fatigue
- slurred, slow speech
- shaky hands
- flapping tremor
- slow movements
- hypomimia (limited facial expressions)

**Stage 4**

“Hospitalization is required for patients in this stage,” says Dr. Bhamidimarri. “They are not arousable (deep sleep) and can be unresponsive.”

- coma (hepatic coma or coma hepaticum)
- This stage of HE can be fatal.

**How long does hepatic encephalopathy last?**

HE can be short-term (acute) or chronic (permanent or recurrent).

Those with recurrent/episodic hepatic encephalopathy experience multiple flare-ups throughout their lives. Recurrent cases are usually seen in people with severe cirrhosis of the liver.

Patients who also have permanent neurological conditions (like cognitive impairment or dementia) are more likely to experience the condition for the rest of their lives. Some health complications of HE may be permanent. These include brain herniation, brain swelling, and organ failure associated with severe liver dysfunction.
How is hepatic encephalopathy diagnosed and treated?

Based on the patient’s symptoms, drinking habits, and medical risk factors, hepatologists (liver specialists) use blood, imaging, and psychometric tests to rule out other possible causes of brain dysfunction.

“The right treatment depends on the severity and the underlying cause of the condition,” Dr. Bhamidimarri says. There is no cure for HE, so the goal of the treatment is to ease symptoms, prevent recurrences, and improve patients’ quality of life.

Treatment options include:

- antibiotics
- lactulose
- zinc
- ventilator or oxygen mask
- liver transplant

Therapeutic management is based on the patient’s stage of hepatic encephalopathy. “The early stages can be mostly managed in an outpatient setting, whereas more advanced stages of HE require hospitalization,” he says. “Patients at risk of aspiration and poor airway control may need intubation and ventilator support in the ICU.”

Those with long-term, recurrent episodes of hepatic encephalopathy require continuous treatment. Episodic HE is usually due to factors like infection, alcohol intake, use of sedatives or narcotics with alcohol or other drugs, electrolyte abnormality, metabolic disorder, or non-compliance to hepatic encephalopathy therapy. “Identifying the precipitating factor and administering early targeted therapy can reverse the symptoms of HE and help patients get to their baseline...
“Patients’ families play an important role, as well,” Dr. Bhamidimarri said. “They must be educated about their loved one’s condition and understand when it’s appropriate to seek medical attention.”

If you or a loved one has chronic liver disease or cirrhosis, hepatologists at the University of Miami Health System can minimize complications with early condition management. Through UHealth’s clinical trials, researchers and doctors work with HE patients to better understand the condition and discover more effective treatment options.

How is cirrhosis of the liver treated at UHealth?

Dana Kantrowitz is a contributing writer for UMiami Health News.

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