Healing the Liver: Probiotics Show Promise for Treating Alcoholic Liver Disease

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People with Alcoholic Liver Disease (ALD) may benefit from taking probiotic supplements, according to a growing body of scientific research.

Chronic, heavy drinking takes a toll on the liver and is the most common cause of life-threatening cirrhosis. But the toxic load can be reduced, experts say, by consuming probiotics – a type of healthy live bacteria found in yogurt, other fermented foods and daily supplements.

“Animal studies clearly show that probiotics can act as a preventive or a treatment measure in ALD,” says Craig J. McClain, M.D., who has done extensive research on alcohol-induced liver injury and is currently leading a National Institutes of Health (NIH) study on probiotics for moderate alcohol hepatitis. “It’s my opinion that there is a strong rationale for certain types of probiotics in patients with ALD.”

Probiotics stimulate the growth of protective bacteria in the intestines. A healthy gut, in turn, has a huge impact on overall well-being – boosting your ability to fight infection, regulate metabolism and reduce toxins and inflammation associated with ALD.

Proven Benefits of Probiotics

One research study shows that alcohol-dependent patients treated with probiotics had significantly lower AST and ALT enzyme levels – two of the key markers for detecting liver injury (“Probiotics Restore Bowel Flora and Improve Liver Enzymes in Human Alcohol-Induced Liver Injury: A Pilot Study,” published in Alcohol: An International Biomedical Journal, Dec. 2008).
The study authors include McClain, a Professor of Pharmacology & Toxicology at the University of Louisville School of Medicine and Director of Gastroenterology at the Robley Rex VA Medical Center in Louisville.

An analysis of nine randomized controlled studies found a reduction in plasma ammonia concentrations among ALD patients treated with probiotics (World Journal of Gastroenterology, Feb. 2015). The results are notable, since higher ammonia blood levels are often detected in patients with acute liver failure.

Probiotic healing power is also evident in a study from Rush University Medical Center. Their research concludes that probiotics lessen alcohol-induced stress and inflammation, and preserve the gut barrier wall to block invasion of harmful pathogens (“Lactobacillus GG treatment ameliorates alcohol-induced intestinal oxidative stress, gut leakiness, and liver injury in a rat model of alcoholic steatohepatitis,” published in Alcohol: An International Biomedical Journal, March 2009).

“Our studies in rodents show that probiotics strongly inhibit negative effects of chronic alcohol use on the intestines and the liver,” says Christopher B. Forsyth, PhD, Associate Professor of Medicine and Biochemistry and Director of the Digestive Diseases Basic Research Laboratory at Rush University Medical Center.

“We believe that probiotics promote a pattern of the intestinal bacteria and their products that inhibit inflammation in the intestine – that in turn results in less liver inflammation as well.”

**Healthy Gut, Healthy Liver:**

The Battle for Good Bacteria

"All disease begins in the gut.”

– Hippocrates, the Father of Modern Medicine

The clusters of bacteria living in your intestines – technically known as human gut microbiota – have a direct link to your liver health. People with alcohol-induced liver injury often have lower levels of healthy gut microbiota such as lactobacilli and bifidobacteria, studies show.
Many risk factors can tip the balance of bacteria from good to bad – including heavy alcohol consumption, a sugar-laden/high-carb diet, chronic stress, and overuse of antibiotics.

This invasion of bad bacteria plays a role in many diseases and can pierce the gut wall, and cause hepatic and systemic inflammation (“leaky gut syndrome”). A gut imbalance can also disrupt the powerful interplay between the liver and the intestines. It’s a critical connection, since the liver gets about 75 percent of its blood supply from the portal vein, which carries oxygen and nutrients from the intestines to the liver for processing.

Probiotics can help by creating a healthier gut profile to fight disease, McClain says.

“Probiotics work through multiple different mechanisms – including improving the gut-flora to more healthy flora, decreasing “leakiness” of the intestine to gut-derived toxins, and reducing intestinal and hepatic (liver-related) inflammation,” he says.

**Which Strain Works Best?**

Several studies on alcoholic liver disease used a well-researched probiotic strain, LGG (*Lactobacillus GG*). LGG is available in drugstores under brand names such as Culturelle; however, there are hundreds of probiotic species, and other strains have also been shown to be effective for ALD patients (i.e., *Bifidobacterium bifidum* and *Lactobacillus plantarum 8PA3*).

“Different probiotics work differently in different people,” and benefits can vary based on the type and severity of liver disease, McClain says. “This is somewhat of a situation of “personalized medicine” for the GI system.”

Some health experts recommend a multi-species probiotic with at least 20 billion live bacteria per dose. Talk to your gastroenterologist or hepatologist for recommendations based on your personal health status. You can also add more fermented and probiotic-rich foods to your diet (read more under *Strategies for a Leaner Liver*).

McClain’s current NIH study seeks to pinpoint the most effective probiotic treatments for Alcoholic Liver Disease. “We are studying whether the particular probiotic –
LGG — that we are using is the best one for ALD,” he says. “And we are trying to determine whether we actually need to use live bacteria or whether we can use products the bacteria secrete or make.”

**Greatest Risk for Liver Damage: Daily Drinkers**

Alcoholic liver disease accounts for more than 18,000 deaths annually in the United States, according to the Centers for Disease Control and Prevention. New research shows that much smaller quantities of alcohol than previously thought can cause ALD.

A minimum daily alcohol intake of **3-4 drinks for men and 2-3 drinks for women**, over a period of 15-20-years, can induce end-stage liver cirrhosis (University of Southern California School of Medicine). But alcohol consumption affects people differently, and other factors such as genetics, diet, drug use and viral infections also play a role in liver disease onset. A new study finds that Hispanics are at much greater risk for developing ALD (“Ethnic Differences in Presentation and Severity of Alcoholic Liver Disease,” published in Alcoholism: Clinical & Experimental Research, March 2015).

Not every drinker will have the same progression of liver injuries. And only 15-30 percent will develop advanced types of ALD such as alcoholic hepatitis or liver cirrhosis.

**Liver damage can occur in three stages:**

- **Alcoholic Steatosis (fatty liver)** is an early stage, reversible condition in which the liver thickens and gets fatter after excess alcohol is consumed. Often people with steatosis have no symptoms (some may feel tired or bloated). Steatosis may be reversed by abstaining from alcohol; in heavy drinkers who do not abstain, steatosis can progress to the more severe:**

- **Alcoholic hepatitis** is acute inflammation of the liver caused by chronic heavy drinking. This condition can lead to cell and organ damage and progress to cirrhosis. People with alcoholic hepatitis often need hospitalization; symptoms can include severe abdominal pain, fever, swelling, gastrointestinal bleeding and jaundice. Severe cases may lead to liver failure or death.
• **Cirrhosis** is the most advanced stage of liver damage. Thick fibrous tissue permanently scars the liver, replacing healthy soft tissue and restricting blood flow from the liver to the heart. Fluid buildup in the abdomen can make the cirrhotic patient appear pregnant, and difficulty in breathing can occur. While cirrhosis is not reversible, symptoms may improve and the progression may be slowed with abstinence from alcohol. Outcomes vary greatly by individual, but experts say the biggest variable is continued drinking. Sobriety must be aggressively pursued.

**Strategies for a Leaner Liver**

There are many steps you can take to improve liver health – starting with abstinence from alcohol.

“There are compelling data showing that abstaining from alcohol at any stage of liver disease improves prognosis,” McClain says.

Alcohol consumption also poses a health risk as an extra source of empty calories. “It is not unusual for (patients) to be consuming an extra 500+ calories a day of alcohol, and this leads to obesity and liver disease,” McClain says. He notes that many of his overweight patients have both alcoholic and non-alcoholic obesity-related liver disease.

Sobriety is the cornerstone of ALD treatment, but other lifestyle changes are also essential. Take steps to manage chronic stress, exercise daily and ask your doctor about following a low-salt diet (< 2,000 mg. sodium per day) to avoid life-threatening fluid buildup.

Good nutrition is especially critical for people with Alcoholic Liver Disease. Experts recommend a diverse diet of nutrient-dense foods (think “clean eating” – whole foods in their natural, non-processed state, which reduce the toxic load on the liver).

“Patients with more advanced ALD are regularly malnourished,” McClain says. “This can be global protein-calorie malnutrition, or deficiencies in selected micronutrients such as zinc. If these patients are consuming inadequate amounts of protein or food calories, we recommend nutritional supplements. We also recommend a daily vitamin. Many of our patients receive zinc or magnesium supplementation.”
If you have ALD, ask your doctor about supplementation and a daily probiotic to restore healthy gut bacteria. You can also add probiotic-rich foods to your diet – including yogurt with live active cultures, kefir (a fermented milk drink), Gouda and other soft cheeses, buttermilk, miso soup, pickles, raw sauerkraut and spicy kimchi. Avoid eating raw seafood, especially oysters, which harbor the *Vibrio vulnificus* bacteria that is potentially lethal for people with advanced liver disease.

Adequate sleep is also necessary for healthy liver function (and a problem for many patients with chronic liver disease, who report difficulty sleeping).

“Our studies in mice show that disruption of normal circadian rhythms makes alcoholic liver inflammation worse,” says Forsyth, the Rush University Medical Center scientist.

Regular screenings for liver cancer – and vaccinations against hepatitis and other viral infections – should be discussed with your doctor if you have ALD. You may also need to stop using certain medications such as ibuprofen that can cause bleeding and increase liver damage. It’s also important to avoid unnecessary antibiotics, since these can alter the balance of healthy gut bacteria.

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**Resources**

To support your healing, here are additional resources on liver health and recovery from alcohol addiction:

**AMERICAN LIVER FOUNDATION**

1-800-GO-LIVER (1-800-465-4837)


_Leading non-profit advocacy and research organization for the prevention, treatment and cure of liver disease._

_“WHAT I NEED TO KNOW ABOUT LIVER TRANSPLANTATION”_

[http://www.niddk.nih.gov/health-information/health-topics/liver-disease/liver-transplant/Pages/ez.aspx#21](http://www.niddk.nih.gov/health-information/health-topics/liver-disease/liver-transplant/Pages/ez.aspx#21)
Consumer information on liver transplants, from the National Institute of Diabetes and Digestive and Kidney Diseases.

AMERICAN ASSOCIATION FOR THE STUDY OF LIVER DISEASES (AASLD)

http://www.aasld.org/
Geared toward clinicians, this website includes a LiverLearning e-portal with lots of webcasts, podcasts and print content on ALD and other liver disease topics.

RETHINKING DRINKING

http://rethinkingdrinking.niaaa.nih.gov/
Self-help strategies for quitting alcohol, with tips to build alcohol refusal skills and cope with cravings. From the National Institute on Alcohol Abuse and Alcoholism.

1-800-NCA-CALL (800-622-2255)
24-hour helpline sponsored by the National Council on Alcoholism and Drug Dependence (NCADD).

1-800-662-HELP (4357)
24-hour National Drug and Alcohol Abuse Hotline offering information and referral services. Sponsored by the Center for Substance Abuse Treatment (CSAT).

1-888-957-3422
24-hour hotline of drugrehab.org, providing free and confidential referrals to rehab centers nationwide.

MUTUAL AID/SUPPORT GROUPS FOR ALCOHOL RECOVERY

http://www.facesandvoicesofrecovery.org/guide/support/
https://ncadd.org/recovery-support/mutual-aid-support
Extensive list of mutual aid organizations, 12-step programs and other support resources for people with addiction.