Exercise and Diet Combine to Improve Liver Health in People With MASH

10-month program led to significant benefits, including weight loss, improved insulin sensitivity and reduced liver fat.

December 30, 2024 By Sukanya Charuchandra

A combination of exercise and diet significantly improved metabolic and liver health in people with metabolic dysfunction-associated steatohepatitis (MASH), according to study results published in the Journal of Hepatology. People who reduced their calorie intake and exercised regularly for 10 months saw clinically meaningful benefits including weight loss, improved cardiovascular fitness, increased insulin sensitivity, reduced liver fat and better liver health.

“Obesity and diabetes are going up in the country, and they are the two main risk factors for fatty liver disease,” senior researcher Elizabeth Parks, PhD, of the University of Missouri School of Medicine said in a news release. “We were able to show in our research how diet and exercise should be the mainstay of treatment for the disease.”

Metabolic dysfunction-associated steatotic liver disease (MASLD), the new name for non-alcoholic fatty liver disease (NAFLD), and its more severe form, MASH (formerly NASH), are responsible for a growing proportion of advanced liver disease worldwide. The new terminology emphasizes the link with obesity, diabetes and other metabolic abnormalities. The buildup of fat in the liver can lead to fibrosis, cirrhosis, and even liver cancer. The first medication for MASH was approved this year, but management still largely relies on lifestyle changes such as weight loss and exercise.

Parks and colleagues assessed the effects of a 10-month diet and exercise intervention on liver disease progression in people with MASH (NCT03151798). This study is the first to examine the impact of diet and exercise on liver health and confirm the organ’s recovery through imaging and diagnostic biopsies, according to the researchers. These techniques allow for measurements of liver inflammation, fat buildup, fibrosis development and other indicators of liver health. Other studies have investigated the impact of either diet or exercise on the liver, not both, Parks noted.

For the study, 16 people with MASH were randomly assigned to participate in the intervention, which involved counseling about reducing calorie intake, a restricted diet and supervised high-intensity interval training three times per week. Nutritionists determined the best food intake for each participant and tracked their caloric and nutrient intake. Eight other participants received physician-directed standard care.

The researchers used magnetic resonance spectroscopy to measure liver fat and performed biochemical and insulin resistance tests before and after the intervention. Midway through the study period, the team also evaluated the participants' body composition and cardiorespiratory fitness.

People in the intervention group saw significant reductions in body weight, fat mass and liver damage compared to those receiving standard care. The intervention patients lost around 13 to 22 pounds and had increased muscle mass, while the control group lost around 0 to 9 pounds. Peak oxygen uptake, an indicator of cardiovascular health, was higher on average in the intervention group.

Both groups showed reductions in total calorie intake, hemoglobin A1c (a marker of long-term blood sugar levels), hepatic insulin resistance (reduced liver response to insulin) and liver fat. However, the treatment group experienced a two-fold greater improvement in peripheral insulin sensitivity, or how effectively muscle and fat tissue use insulin. This improvement was closely linked to higher peak oxygen uptake and resolution of liver disease.

"Exercise and energy restriction elicited significant and clinically meaningful treatment effects on liver health, potentially driven by a redistribution of excess nutrients to skeletal muscle, thereby reducing hepatic nutrient toxicity," the study authors concluded. "Clinical guidelines should emphasize the addition of aerobic exercise in lifestyle treatments for the greatest histologic benefit in individuals with advanced MASH."

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