Lower Odds of Fatty Liver Disease with Higher Vitamin D Levels

METABOLIC dysfunction-associated steatotic liver disease, or MASLD, is a condition in which excess fat accumulates in the liver along with one or more metabolic risk factors. Previously known as non-alcoholic fatty liver disease (NAFLD), MASLD has become the most common chronic liver disease worldwide, affecting roughly 30% of adults.

COULD VITAMIN D BE RELATED TO LIVER HEALTH?

The liver converts much of the vitamin D3 in the blood into 25(OH)D, leading some researchers to speculate that liver disease or poor liver function may contribute to low 25(OH) D levels or a poor response to supplementation. However, the relationship may go both ways, as low vitamin D levels may also negatively affect liver function and health.

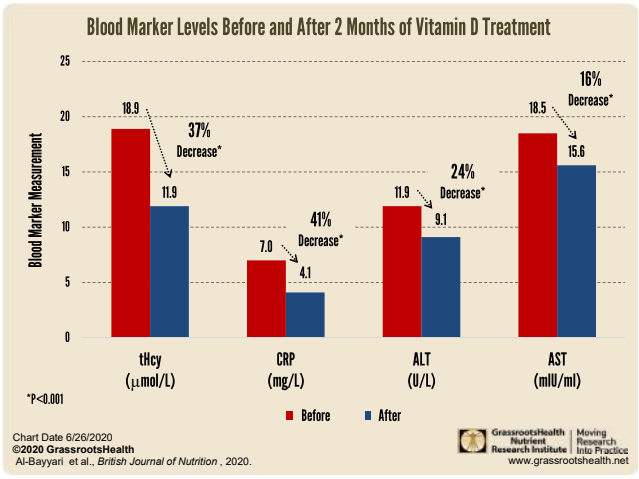
A 2020 randomized double-blind placebo-controlled clinical trial conducted by Al-Bayyari et al. demonstrated a relationship between vitamin D supplementation and liver health. The trial consisted of 100 women who were overweight and had vitamin D deficiency. Participants receiving 50,000 IU of vitamin D per week for two months experienced significant decreases in the liver enzymes ALT and AST, as well as decreases in CRP, a marker of inflammation, and homocysteine, a marker associated with cardiovascular risk. The placebo group experienced no significant changes in these markers.

HIGHER VITAMIN D LINKED TO LOWER RISK OF FATTY LIVER DISEASE

Now, a newly published study by He et al. has found a significant relationship between vitamin D status and fatty liver disease. This new study included 35,468 adults undergoing routine health examinations. The average age was 46 years, and nearly 30% of participants were vitamin D deficient (below 20 ng/mL), while another 42% were insufficient (20 to 29 ng/mL).

Among the 29,452 participants with liver ultrasound results, 36.1% had MASLD.

Researchers examined vitamin D levels in relation to fatty liver and several measures of metabolic health, including body mass index (BMI), triglycerides, HDL cholesterol, fasting glucose, and uric acid. After adjusting for age and sex, increasing vitamin D levels were associated with a more favorable metabolic profile, including lower triglycerides, lower BMI, and higher HDL cholesterol.



Higher vitamin D was also associated with lower odds of several metabolic abnormalities, with some of the strongest relationships seen for high triglycerides and fatty liver.

THE VITAMIN D–FATTY LIVER RELATIONSHIP REMAINED EVEN AFTER ACCOUNTING FOR METABOLIC FACTORS

Because obesity, abnormal blood lipids, and impaired glucose metabolism are closely connected to MASLD, the authors wanted to determine whether the apparent relationship with vitamin D could simply be explained by these other metabolic factors. For many of the metabolic outcomes they examined, the relationship with vitamin D became weaker after researchers accounted for these factors. The relationship with fatty liver, however, remained significant.

In fact, for each 4 ng/mL (10 nmol/L) increase in 25(OH)D, the odds of fatty liver were approximately 7% lower after adjustment for BMI, triglycerides, HDL cholesterol, fasting glucose, uric acid, age, and sex. The association remained consistent in both men and women and across different age groups.

OTHER METABOLIC FACTORS EXPLAINED ONLY PART OF THE RELATIONSHIP

The authors then looked to see how much of the relationship between vitamin D and fatty liver could be statistically explained by metabolic factors. They found that 37.6% of the observed association between vitamin D and fatty liver was explained by the metabolic factors measured in the study. Among those factors, triglycerides accounted for the largest portion of the statistically explained association, followed by HDL cholesterol and BMI. Fasting glucose contributed very little, while uric acid did not significantly explain the relationship.

More than 60% of the observed relationship between vitamin D and fatty liver was not explained by the metabolic factors included in the analysis.

The authors concluded that vitamin D status deserves further investigation as a potentially important marker of metabolic liver health.

GrassrootsHealth
Moving Research into Practice

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