

Nutrition Interventions for Chronic Liver Diseases and Nonalcoholic Fatty Liver Disease

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KEYWORDS

- Nonalcoholic liver disease • Nutrition • Diet • Liver disease • Lifestyle intervention
- Liver cirrhosis

KEY POINTS

- Patients suffering from liver disease are susceptible for malnutrition from both overnutrition and undernutrition.
- Nonalcoholic fatty liver disease (NAFLD) has an increasing worldwide prevalence owing to the poor modern diet and the epidemic of obesity.
- NAFLD is closely associated with the metabolic syndrome and cardiovascular disease. Dietary pattern and lifestyle contribute to the development of comorbidities.
- Both weight loss and changes in diet are independently associated with improvement in the liver in NAFLD. A healthy diet is beneficial even when weight reduction is not achieved.
- Patients with decompensated cirrhosis develop undernutrition from increased energy demand, decreased intake and absorption and organ dysfunction.

INTRODUCTION

Liver disease is one of the main causes of hospital admissions worldwide¹ and the 12th leading cause of mortality in many countries.² Among all etiologies (toxic–metabolic, viral, autoimmune and genetic disorders), nonalcoholic fatty liver disease (NAFLD) features as the most common cause,³ with increasing prevalence attributed to the epidemic of metabolic syndrome. Given the high prevalence of NAFLD, this paper focuses on the nutrition interventions in patients with NAFLD, and we also address nutrition issues and interventions in patients who have progressed on to cirrhosis and decompensated liver disease.

Malnutrition is defined as either having not enough or too much nutrients in the diet resulting in health problems. It is a major problem in patients with liver disease,

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in the forms of both overnutrition and undernutrition. Although NAFLD is caused by excessive intake in certain nutrients, patients with chronic liver disease are at risk of other forms of malnutrition owing to both disease-specific impairment (ie, reduced fat-soluble vitamins in cholestatic disorders) and as a consequence of organ dysfunction. An estimated 65% to 90% of patients with advanced liver disease suffer from undernutrition.^{4,5} Addressing the malnutrition can result in disease reversal, prevent disease progression, or improve prognosis and quality of life (QOL) in a large proportion of these patients. Nutrition evaluation and interventions should be part of the management of every patient with NAFLD or advanced liver disease.

Nonalcoholic Fatty Liver Disease

NAFLD is spectrum of disease characterized by fat deposits in the liver in the absence of significant alcohol consumption. The spectrum ranges from simple steatosis, thought to be a benign condition, to the more severe form, nonalcoholic steatohepatitis (NASH), which is thought to lead to liver cirrhosis, hepatocellular carcinoma (HCC), and to be associated with cardiovascular disease and higher risk of both liver-related and overall mortality.³ It is the most common cause of liver disease worldwide with prevalences ranging from 25% to 45%.⁶ In the United States, the prevalence of NAFLD is estimated to be up to 49% and of NASH to be 12%.⁷ Although the prevalence of other liver diseases has been stable over the last 20 years, that of NAFLD has increased remarkably along with the prevalence of the metabolic syndrome and diabetes.⁸ NAFLD is considered the hepatic manifestation of the metabolic syndrome and is strongly linked to obesity. An estimated 80% of patients with obesity have NAFLD.⁹ The natural history of NAFLD varies and depends on the severity of the liver damage and population risk factors, such as obesity and diabetes.¹⁰ Although simple steatosis is thought to have a benign course, NASH, the severe end of the disease spectrum characterized by inflammation, hepatocyte ballooning, and apoptosis, is thought to be a progressive disease in which patients are at risk of developing liver cirrhosis and HCC.^{11,12} Of patients with NASH, 15% to 20% will develop end-stage liver disease within 10 to 20 years, with NASH projected to become the leading indication for liver transplantation in the next decade (Fig. 1).^{3,13} In addition to the increased risk of liver-related complications and mortality, patients with NASH have an increased risk of cardiovascular disease and overall mortality.¹⁴ Given the high worldwide prevalence of NAFLD, the social impact (reduced QOL, morbidity, and mortality), and substantial costs of managing the complications from NASH, early intervention is vital. Given the prevalence of the disease, primary care providers will play a key role in this early intervention.

Obesity is a worldwide problem, with prevalence rates almost doubling in the last 3 decades.¹⁵ According to the World Health Organization,¹⁶ in 2014, more than 30% of the United States population were obese and more than 60% overweight. The number of individuals who are overweight worldwide in 2015 is estimated to exceed 2.3 billion. Furthermore, 15% of all Western population and 35% of patients with obesity will develop steatohepatitis (NASH).¹⁷ This pandemic disease is attributed to both the increased amounts of processed foods high in fructose, sodium, and saturated fats, and the increasingly sedentary lifestyle.¹⁸ Obesity is considered a chronic state of low-grade inflammation, being associated with complications such as the metabolic syndrome, type 2 diabetes, hypertension, and cardiovascular disease.¹⁹ It has also been linked with increased risks of certain cancers, such as colon, breast, endometrium, kidney, esophagus, stomach, pancreas, and gallbladder.^{20,21} The

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