Nonalcoholic Fatty Liver Disease

Fact Sheet

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What is Nonalcoholic fatty liver disease?

Nonalcoholic fatty liver disease (NAFLD) refers to a range of liver conditions where fat builds up in the liver, not due to alcohol use. The most common type is nonalcoholic steatohepatitis (NASH), which involves fat accumulation along with liver inflammation. NASH is the leading cause of liver disease in the U.S. and may resemble alcoholic hepatitis, though it often presents without noticeable symptoms.

Causes and Risk Factors

NAFLD is caused by a combination of genetic factors, metabolic issues, and environmental influences, which lead to the buildup of fat in the liver.
Key contributors include:

Genetics and family history.

Insulin resistance. (related to obesity, diabetes mellitus, and metabolic syndrome)

Age. Most patients are diagnosed in their 40s or 50s, and advancing age increases overall disease risk and risk of complications. However, there has been an increasing prevalence of NAFLD in children and young adults

Hyperlipidemia, especially hypertriglyceridemia.

Diet. A diet high in saturated fat and refined carbohydrates is linked to metabolic dysfunction in NAFLD, particularly lipid dysregulation and insulin resistance.

Other conditions that may be associated with NAFLD include **polycystic ovary syndrome**, **hypothyroidism**, and **obstructive sleep apnea.**

Treatment

The primary treatment for NAFLD involves lifestyle changes:

Weight Loss - Between 20-60% of adults with a BMI of 30 or higher have NAFLD. Weight loss is essential, as even a reduction of 7-10% of body weight can significantly improve liver health. Most patients benefit from gradual, sustained weight loss through a combination of diet and exercise.

Healthy Diet - Focus on a diet low in animal foods and tropical oils and high in fruits, vegetables, legumes, and whole grains.

Exercise - Regular physical activity helps reduce liver fat and improve overall health.
In some cases, medications might be recommended to manage associated conditions like diabetes or high cholesterol. Vitamin E supplements and certain diabetes medications may also be beneficial.

Nutritional Considerations

NAFLD is often linked to obesity, especially abdominal fat, which promotes insulin resistance. Diets high in saturated fats and refined carbohydrates, can worsen NAFLD, while high fiber diets with unsaturated fats can protect against it. Supplements like omega-3s, probiotics, vitamin E, and milk thistle may also help manage NAFLD. Avoiding excess alcohol and monitoring vitamin D levels are also important.

Replace Saturated Fats with Polyunsaturated and Monounsaturated Fats: Studies show that saturated fats are more likely to contribute to NAFLD, while unsaturated fats help reduce liver fat. This difference is partly because unsaturated fats are more easily processed by the liver and help reduce fat production. By choosing foods rich in unsaturated fats, such as nuts, seeds and avocado, you can support better liver health.

Dietary Patterns: Research suggests that plant-based diets can lower the risk of NAFLD. However, the quality of the plant-based diet is important, as some plant foods can increase the risk of NAFLD.

- According to a 2023 study published in BMC Medicine, higher consumption of healthy plant-based diets is associated with lower NAFLD risk and liver fat content, regardless of genetic susceptibility. In contrast, unhealthy, highly processed plant-based diets are associated with higher NAFLD risk and intrahepatic steatosis. For example, consuming refined grains, sugar-sweetened beverages, processed food with added oil, and fruit juices can increase the risk of NAFLD.
- A 2024 study published in Online Library found that vegetarian diets were associated with a lower prevalence of NAFLD among US adults, especially for those with lower waist circumferences.
- A 2019 study published in PubMed found that participants in the upper third of Plant-Based Diet Index (PDI) had a 21% lower odds of NAFLD compared to those in the lowest third. PDI is a tool used to assess the quality of a person's diet based on their consumption of plant-based versus animal-based foods. It categorizes foods into healthy and unhealthy plant-based groups, emphasizing the benefits of whole plant foods and the potential risks of consuming processed plant foods and animal products.

Nutritional Supplements: when managing NAFLD, certain nutritional supplements can play a supportive role.

- **Omega-3 Fatty Acids:** At a dose of around 4 g/day, omega-3 supplements can reduce liver fat and inflammation, improve insulin sensitivity, and decrease lipid production.
- **Vitamin E:** In adults, vitamin E supplements (800 IU/day) combined with either ursodeoxycholic acid or pioglitazone can be an effective treatment for NAFLD.
- **Probiotics:** Gut health is increasingly recognized as important in NAFLD. Probiotics can help restore a healthy balance of gut bacteria, reducing liver inflammation and improving insulin sensitivity.
- **Milk Thistle:** The active compounds in milk thistle, such as silymarin and silybin, have been shown to reduce liver enzymes and improve antioxidant activity in the liver.
- **Avoid Iron supplements:** Excess iron can accumulate in the liver and worsen NAFLD. Focus on plant-based iron sources, which are less likely to contribute to iron overload, and avoid iron supplements unless prescribed by your healthcare provider.

Alcohol Consumption: Alcohol can exacerbate liver damage, particularly in individuals with a BMI of 30 or higher. While light to moderate drinking might be less harmful in those with lower BMI, it's generally advised to limit alcohol consumption if you have NAFLD.

Key Takeaways

Nonalcoholic fatty liver disease (NAFLD) is a prevalent liver condition, often linked to lifestyle factors such as poor diet, physical inactivity, and obesity. It can lead to more severe liver diseases like nonalcoholic steatohepatitis (NASH). Genetic factors, insulin resistance, and other health conditions also contribute to NAFLD. Effective management focuses on lifestyle changes, including weight loss, a whole food, plant-based diet, and regular exercise. Nutritional supplements like omega-3 fatty acids, vitamin E, and probiotics can offer additional support. It's essential to avoid harmful habits like alcohol consumption and the use of iron supplements unless prescribed. Adopting these strategies can significantly improve liver health and reduce the risk of complications associated with NAFLD.

References

Mittal S, El-Serag HB, Sada YH, et al. Hepatocellular Carcinoma in the Absence of Cirrhosis in United States Veterans is Associated With Nonalcoholic Fatty Liver Disease. Clin Gastroenterol Hepatol. 2016;14(1):124-31.e1. [PMID:26196445]

Zhou F, Zhou J, Wang W, et al. Unexpected Rapid Increase in the Burden of NAFLD in China From 2008 to 2018: A Systematic Review and Meta-Analysis. Hepatology. 2019;70(4):1119-1133. [PMID:31070259]

Leung C, Rivera L, Furness JB, et al. The role of the gut microbiota in NAFLD. Nat Rev Gastroenterol Hepatol. 2016;13(7):412-25. [PMID:27273168]

Vilar-Gomez E, Martinez-Perez Y, Calzadilla-Bertot L, et al. Weight Loss Through Lifestyle Modification Significantly Reduces Features of Nonalcoholic Steatohepatitis. Gastroenterology. 2015;149(2):367-78.e5; quiz e14-5. [PMID:25865049]

Chalasani N, Younossi Z, Lavine JE, et al. The diagnosis and management of non-alcoholic fatty liver disease: practice guideline by the American Gastroenterological Association, American Association for the Study of Liver Diseases, and American College of Gastroenterology. Gastroenterology. 2012;142(7):1592-609. [PMID:22656328]

Souza MR, Diniz Mde F, Medeiros-Filho JE, et al. Metabolic syndrome and risk factors for non-alcoholic fatty liver disease. Arq Gastroenterol. 2012;49(1):89-96. [PMID:22481692]

Yki-Järvinen H. Nutritional Modulation of Non-Alcoholic Fatty Liver Disease and Insulin Resistance. Nutrients. 2015;7(11):9127-38. [PMID:26556368]

Hossain N, Kanwar P, Mohanty SR. A Comprehensive Updated Review of Pharmaceutical and Nonpharmaceutical Treatment for NAFLD. Gastroenterol Res Pract. 2016;2016:7109270. [PMID:27006654]

Orci LA, Gariani K, Oldani G, et al. Exercise-based Interventions for Nonalcoholic Fatty Liver Disease: A Meta-analysis and Meta-regression. Clin Gastroenterol Hepatol. 2016;14(10):1398-411. [PMID:27155553]

Green CJ, Hodson L. The influence of dietary fat on liver fat accumulation. Nutrients. 2014;6(11):5018-33. [PMID:25389901]

Neuman MG, Nanau RM, Cohen LB. Nonmedicinal interventions in nonalcoholic fatty liver disease. Can J Gastroenterol Hepatol. 2015;29(5):241-52. [PMID:26076224]

Lv, Y., Rong, S., Deng, Y. et al. Plant-based diets, genetic predisposition and risk of non-alcoholic fatty liver disease. BMC Med 21, 351 (2023).

Barnard ND, Scialli AR, Turner-McGrievy G, et al. The effects of a low-fat, plant-based dietary intervention on body weight, metabolism, and insulin sensitivity. Am J Med. 2005;118(9):991-7. [PMID:16164885]

Li R, Li M, Fly AD, Bidulescu A, Luo J. Vegetarian diets and risk of nonalcoholic fatty liver disease: An observational study of National Health and Nutrition Examination Survey 2005-2018 using propensity score methods. J Hum Nutr Diet. 2024 Jun;37(3):643-654. doi: 10.1111/jhn.13290. Epub 2024 Feb 13. PMID: 38348568.

Mazidi M, Kengne AP. Higher adherence to plant-based diets are associated with lower likelihood of fatty liver. Clin Nutr. 2019 Aug;38(4):1672-1677. doi: 10.1016/j.clnu.2018.08.010. Epub 2018 Aug 21. PMID: 30578029.

Hua NW, Stoohs RA, Facchini FS. Low iron status and enhanced insulin sensitivity in lacto-ovo vegetarians. Br J Nutr. 2001;86(4):515-9. [PMID:11591239]

Aigner E, Weiss G, Datz C. Dysregulation of iron and copper homeostasis in nonalcoholic fatty liver. World J Hepatol. 2015;7(2):177-88. [PMID:25729473]

Liangpunsakul S, Chalasani N. What should we recommend to our patients with NAFLD regarding alcohol use? Am J Gastroenterol. 2012;107(7):976-8. [PMID:22764020]

Di Minno MN, Russolillo A, Lupoli R, et al. Omega-3 fatty acids for the treatment of non-alcoholic fatty liver disease. World J Gastroenterol. 2012;18(41):5839-47. [PMID:23139599]

Bashiardes S, Shapiro H, Rozin S, et al. Non-alcoholic fatty liver and the gut microbiota. Mol Metab. 2016;5(9):782-94. [PMID:27617201]

Machado MV, Cortez-Pinto H. Diet, Microbiota, Obesity, and NAFLD: A Dangerous Quartet. Int J Mol Sci. 2016;17(4):481. [PMID:27043550]

Ma YY, Li L, Yu CH, et al. Effects of probiotics on nonalcoholic fatty liver disease: a meta-analysis. World J Gastroenterol. 2013;19(40):6911-8. [PMID:24187469]

Wang X, Li W, Zhang Y, et al. Association between vitamin D and non-alcoholic fatty liver disease/non-alcoholic steatohepatitis: results from a meta-analysis. Int J Clin Exp Med. 2015;8(10):17221-34. [PMID:26770315]

Li J, Cordero P, Nguyen V, et al. The Role of Vitamins in the Pathogenesis of Non-alcoholic Fatty Liver Disease. Integr Med Insights. 2016;11:19-25. [PMID:27147819]

Cacciapuoti F, Scognamiglio A, Palumbo R, et al. Silymarin in non alcoholic fatty liver disease. World J Hepatol. 2013;5(3):109-13. [PMID:23556042]

Corbin KD, Zeisel SH. Choline metabolism provides novel insights into nonalcoholic fatty liver disease and its progression. Curr Opin Gastroenterol. 2012;28(2):159-65. [PMID:22134222]