Nonalcoholic Fatty Liver Disease

Description/Etiology
Nonalcoholic fatty liver disease (NAFLD) is the most common chronic liver disease in both adults and children, affecting more than 80% of obese adults and up to 38% of obese children. It is characterized by significant accumulation of fat in the liver, in the absence of excess alcohol intake. NAFLD is a component of metabolic syndrome, and it is associated with increased risk for cardiovascular diseases (CVD), diabetes mellitus type 2 (DM2), and chronic kidney disease (CKD). NAFLD is characterized by a spectrum of liver abnormalities including fat accumulation, or steatosis, which may progress to hepatic inflammation, also known as nonalcoholic steatohepatitis (NASH), fibrosis, cirrhosis, end-stage liver disease (ESLD) and possibly hepatocellular carcinoma. It is a rapidly increasing indicator for liver transplantation. Lifestyle interventions that focus on dietary changes, weight loss, and exercise are the foundation treatment for NAFLD.

Facts and Figures
› The increasing incidence of pediatric NAFLD is becoming a serious public health concern. Because it is frequently overlooked in children until it progresses to ESLD, researchers believe that large-scale screening of high-risk children, particularly those who are overweight or obese, is important. Screening should include serum transaminase measurement and liver ultrasound (Berardis et al., 2014)
› Estimates suggest that between 75 million and 100 million individuals in the United States have NAFLD. Mexican Americans have significantly higher prevalence of NAFLD than non-Hispanic Whites, and non-Hispanic Blacks have the lowest prevalence of the three groups (Schneider et al., 2014)
› Researchers who examined the relationships of comorbid diseases such as DM2, hypertension, obesity, and dyslipidemia on the degree of fibrosis and progression of NAFLD, determined that DM2 is a significant risk factor for advanced fibrosis. They suggest that management of impaired glucose tolerance and DM2 can prevent the progression of NAFLD, even in early stages of NASH (Nakahara et al., 2014)
› Study results overwhelmingly show that modification in diet and exercise is the most effective treatment for most individuals with NAFLD. Moderate calorie restriction to promote weight loss, a reduction in refined carbohydrates and saturated or trans fats, and an increase in physical activity have all been shown to prevent fat accumulation in the liver (Anderson et al., 2015; Hashemi Kani et al., 2014; Oni et al., 2015)

Risk Factors
Risk factors for NAFLD include
› obesity(central)
› insulin resistance
› diabetes mellitus type 2 (DM2)
› polycystic ovarian syndrome (PCOS)
› dyslipidemia, especially hypertriglyceridemia
› ethnicity (e.g., Mexican Americans)
› sedentary lifestyle
› total parenteral nutrition (TPN)
› severe weight loss, as with bariatric surgery
Signs and Symptoms/Clinical Presentation

› Individuals with NAFLD are often asymptomatic, although in some cases patients report fatigue and feeling discomfort in the upper right quadrant
› Up to 75% of patients with NAFLD have hepatomegaly (i.e., an abnormally large liver)
› Central obesity is common

Nutritional Assessment

› Patient Medical History
  • Review patient’s medical chart and/or ask about related medical history and significant family history. See Risk Factors and Signs and Symptoms/Clinical Presentation above

› Patient Dietary History
  • Conduct a diet analysis by asking the patient to complete a diet history. Assess for calories, carbohydrate intake, and fat, which may be in excess of recommended
  – Useful tools for evaluating the patient’s strengths and weaknesses include a food frequency questionnaire and a 3-day diet recall that includes 1 weekend day
  • Ask about personal habits including alcohol, soda, and sweets consumption; eating at night; and frequency of consuming foods from vending machines and fast foods
  • Ask about the use of any vitamin/mineral supplements, probiotic supplements, or other herbal and over-the-counter supplements
  • Assess patient’s level and frequency of physical activity, which may be less than recommended

› Anthropometric Data
  • Obtain patient’s height and weight; if appropriate, obtain patient’s waist circumference
  – A waist circumference of >102 cm for male or > 88 cm for females is associated with metabolic syndrome and is a risk factor for NAFLD
  • Evaluate weight and calculate body mass index (BMI) by dividing body weight (kilograms) by height (meters squared); or 703 multiplied by weight (pounds) and divided by height (inches squared)
  – Underweight <18.5; normal 18.5–24.9; overweight 25–29.9; obese > 30
  – Patient’s BMI may be in the overweight or obese range

› Laboratory Tests and Diagnostic Tests of Particular Interest to the Nutritionist
  • Aminotransferase and alkaline phosphatase levels may become elevated as NAFLD progresses, but laboratory test values are frequently normal in persons with hepatic steatosis
  • Fasting blood glucose and A1C may be elevated, suggesting impaired glucose tolerance or DM2
  • Fasting blood lipids may indicate elevated total cholesterol and LDL cholesterol, hypertriglyceridemia, or low HDL cholesterol
  • Liver ultrasound may indicate the presence of steatosis, but often only if it is greater than 33%

› Other Diagnostic Tests/Studies
  • Histologic examination of biopsied liver tissue will identify the presence of fibrosis and inflammation and the degree of liver damage with NAFLD

Treatment Goals

Reduce Body Weight or Maintain a Healthy Body Weight

› Encourage moderate calorie reduction to promote weight loss and achieve a desirable healthy body weight
  – Encourage the use of a food diary to monitor intake and dietary changes
  – Educate the patient about appropriate meal planning, portion sizes, and calorie content of foods
  • Review the benefits of regular physical activity for weight management and reduction of steatosis, and assist the patient to identify ways to increase daily physical activity

Individualize Medical Nutrition Therapy to Improve Metabolic Abnormalities

› Assess intake of refined carbohydrates and saturated or trans fats and educate the patient about methods to reduce the intake of these
  • Encourage substitution with high fiber, complex carbohydrates, and sources of unsaturated fats

Promote Optimal Physiologic Status and Reduce Risk for Complications

› Educate the patient about ways to reduce the risk factors associated with NAFLD, especially obesity, insulin resistance, and hypertriglyceridemia
• Encourage regular nutrition and medical follow-up appointments to monitor for complications

Provide Emotional Support and Educate
• Assess anxiety level and coping ability; educate and encourage discussion about potential complications of NAFLD, treatment options, and individualized prognosis
• If appropriate, request referral to a social worker for identification of local resources for support groups and treatment programs (see What Do I Need to Tell the Patient/Patient’s Family? below)

Food for Thought
• Researchers have identified extrahepatic complications related to NAFLD that include an increased risk of gastrointestinal reflux disease (GERD) symptoms, poor pulmonary function, and CKD in patients with type 1 diabetes (Catanzaro et al., 2014; Peng et al., 2015; Targher et al., 2014)
• In a review on the effects of bariatric surgeries on NAFLD, researchers determined that in most cases, bariatric surgeries result in improvements in NAFLD, including reduced steatosis, fibrosis, and NASH (Hassanian et al., 2014)
• Gut microbiota and the gut–liver axis have been examined in the pathogenesis of NAFLD. In a randomized, double-blind, placebo-controlled study on 52 patients with NAFLD, subjects who received symbiotic supplementation (i.e., probiotics and prebiotics) in addition to lifestyle modifications had more significant reduction in NAFLD markers than subjects who received placebo with lifestyle modifications. Researchers concluded that symbiotic supplementation can improve the efficacy of lifestyle modifications that include exercise and energy-balanced diet (Eslamparast et al., 2014)
• Although some drugs have shown to be effective for the treatment of NAFLD in randomized clinical trials, no drug is currently approved by the U.S. Food and Drug Administration for pharmacological treatment of NAFLD
• Research is currently underway to determine whether the use of certain antidiabetic medications, even in those without DM2, or antioxidants such as vitamin E, selenium, and betaine, may be helpful in treating NASH (National Institutes of Diabetes and Digestive and Kidney Diseases, 2014)

Red Flags
• Untreated NASH is progressive and can lead to ESLD
• Vitamin E supplementation has been shown to have a beneficial effect on NAFLD, but its use is controversial because of reports of increased all-cause mortality at high doses

What Do I Need to Tell the Patient/Patient’s Family?
• When possible, provide written material on NAFLD and lifestyle modifications to reinforce verbal education
• Encourage attending group therapy specific to existing comorbid conditions and for social support from others who face similar health challenges
• Encourage becoming involved in a weight-loss program that encompasses exercise, nutrition, and behavior modification
• Provide educational material on medical nutrition therapy for any comorbid disorders

Related Guidelines
For additional information, see American Liver Foundation. NAFLD

References


