



The Role of the Nurse Practitioner in the Management of Nonalcoholic Fatty Liver Disease

ABSTRACT

The incidence of nonalcoholic fatty liver disease (NAFLD) has increased over the past few decades because of the obesity epidemic and is also strongly associated with diabetes Type 2. Patients often present asymptotically until the liver disease becomes advanced. Alternatively, persons with NAFLD can present with various stages of inflammation, hepatosis, or fibrosis, which can eventually result in cirrhosis and lead to hepatocellular carcinoma. Lifestyle modifications are the most important aspects of cirrhosis prevention. These changes are crucial because cirrhosis is a known cause of long-term liver disease. Nurse practitioners play an important role in the early detection of NAFLD and prevention of its potentially life-threatening complications.

Nonalcoholic fatty liver disease (NAFLD) has now become a common precursor to more severe liver disease in the United States. Fatty liver occurs when hepatocytes are infiltrated with fat, especially triglycerides (Alexander, Schaffer, & Zeilman, 2003). Metabolic syndrome is implicated in the development of insulin resistance, which alters glucose and lipid metabolism. This in turn causes an increased uptake of triglycerides, which are then stored within the hepatocytes (Page, 2012).

Etiology

Multiple theories exist that attribute the development of nonalcoholic steatohepatitis (NASH) to NAFLD (Page, 2012). Oxidative stress has also been implicated in the etiology of fatty liver (Braunwald et al., 2001). The process is not fully understood; however, it is thought to contribute to the inflammatory response, which can result in fibrosis (Rafiq & Younossi, 2009). There is also a theory based on a two-hit hypothesis, which is multifactorial—causing release of free fatty acids and lipolysis (Rafiq & Younossi, 2009). Another theory is based on the concept of generation of free radicals, which causes an inflammatory response and cell death (Rafiq & Younossi, 2009).

Nonalcoholic fatty liver disease has become an increasing health concern due to the rise in metabolic syndrome. It is considered to be a hepatic manifestation of metabolic syndrome and is strongly associated with insulin resistance and obesity (Ong & Younossi, 2007; Rafiq & Younossi, 2009; Wainwright, 2015). Patients can also have NASH, which can progress to cirrhosis and even hepatocellular carcinoma (Starley, Calcagno, & Harrison, 2010). Because of the increased incidence of obesity, this disease is commonly first seen and often diagnosed in the primary care setting. Common risk factors include increased waist circumference (>40 in. in men and 35 in. in women), hypertension (blood pressure >130/85 mmHg), diabetes Type 2, fasting blood

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glucose (>100 mg/dl), elevated triglycerides (>150), and decreased high-density lipid level (<40 in men and 50 in women) (Brunt, 2010; Rafiq & Younossi, 2009). It is important for practitioners to understand the causes of NAFLD and current evidence-based guidelines for treatment.

Diagnostics

A definitive diagnosis of NAFLD is based on three key factors: evidence of fatty infiltration through imaging (ultrasonography, magnetic resonance imaging, or liver biopsy), exclusion of excessive alcohol consumption, and exclusion of other causes of hepatic steatosis such as alcohol abuse, hepatotoxic chemical, or drug exposure (Iser & Ryan, 2013). Routine screening blood chemistries can also serve as effective mechanisms in the detection of NAFLD in asymptomatic individuals. Elevations of alanine transaminase (ALT) and aspartate transaminase (AST) of more than two times and up to 10 times the upper normal limit would raise concern for the presence of fatty liver disease in at-risk populations (McCullough, 2004).

It is important to stage the severity of the liver disease in order to determine the risk for the development of cirrhosis and progression to hepatocellular carcinoma (Iser & Ryan, 2013). Other noninvasive testing such as the FibroScan test can also aid in staging the severity of fibrosis. This test is useful for noninvasive scoring of the severity of liver damage by an acoustic radiation force impulse (Iser & Ryan, 2013). Other important diagnostics include complete blood count, bilirubin, lipid panel, fasting blood glucose, and hemoglobin A_{1C}, which are beneficial in determining baseline values (Page, 2012; Wilkins, Tadmor, Hepburn, & Schade, 2013). However, a liver biopsy still remains the gold standard for the diagnosis of NAFLD and staging progression of the disease (Iser & Ryan, 2013).

Management of NAFLD

There are four main areas of focus when considering management strategies in NAFLD: lifestyle modifications, targeting components of metabolic syndrome, liver-directed pharmacotherapy for high-risk patients, and managing the complications of cirrhosis (Dyson, Anstee, & McPherson, 2015). Lifestyle modifications are some of the most important aspects in the management of NAFLD. Weight loss and dietary adjustments are crucial to the management of diabetes, obesity, hypertension, and dyslipidemia, which are commonly associated with metabolic syndrome. Patients should be encouraged to exercise at least 30 minutes daily up to five times per week (Rafiq & Younossi, 2009). Weight loss can slow the progression of liver inflammation but it cannot affect actual liver fibrosis. Dietary changes such as decreased calorie, fat, and carbohydrate intake

can also be beneficial in the treatment of fatty liver disease and aid in weight loss (Wainwright, 2015). Some patients are even opting to undergo bariatric surgery for obesity and complications of metabolic syndrome. However, evidence does not support this procedure as a long-term treatment option for NAFLD (Wainwright, 2015). Some clinicians also utilize anti-diabetic drugs such as pioglitazone (Actos), which is a thiazolidinedione that increases insulin sensitivity and helps reduce hepatosis. Long-term effects have not been studied to determine its effectiveness in halting the progression of liver disease (Wainwright, 2015).

Although it has no effect on fibrosis, vitamin E is a supplement being utilized to improve NAFLD. Vitamin E must be used cautiously in patients with cardiovascular disease due to the increased risk of congestive heart failure and has not been studied for long-term effects on progression of liver disease (DeNoon, 2017; Wainwright, 2015). Orlistat, which is a lipase inhibitor that aids in weight loss has been shown to improve hepatosis; however, this has to be used in combination with other lifestyle modifications (Dyson et al., 2015). It is also important for patients to avoid hepatotoxic drugs and substances, especially alcohol intake because it is a known cause of liver disease.

Implications for Practice

Nurse practitioners and other healthcare professionals should be well informed about the diagnosis, management, and potential outcomes of this disease process. A common presentation of NAFLD is an incidental finding of abnormal liver function tests, such as elevated AST and ALT (Iser & Ryan, 2013). Patients are often asymptomatic because manifestations of liver disease frequently do not appear until the impairment becomes severe. However, to distinguish the diagnosis of NAFLD from other hepatic disorders, the clinician must first rule out other sources of elevated liver enzymes.

Common causes of elevated liver enzymes include exposure to hepatotoxic drugs, alcohol use, cholestatic disease, primary sclerosing cholangitis, primary biliary cirrhosis, hereditary hyperbilirubinemia, hereditary hemochromatosis, Wilson's disease, and α -1 antitrypsin deficiency (Alexander et al., 2003). Secondary fatty liver disease can also occur because of use of total parenteral nutrition and drugs such as amiodarone, diltiazem, and tamoxifen (Ong & Younossi, 2007; Pagano et al., 2002). Because NAFLD and NASH have the potential to progress to chronic liver disease, it is important for clinicians to routinely check liver enzymes on high-risk patients with Type 2 diabetes and/or obesity. Nonalcoholic fatty liver disease severity is strongly associated with insulin resistance and the level of insulin required for glycemic

control (Wainwright, 2015). Referral to gastroenterology is recommended for routine screening such as hepatic ultrasonography, laboratories, and possible liver biopsy if fatty liver disease is suspected or diagnosed.

Summary

In summary, patients must understand that lifestyle modifications, such as control of diabetes, hypertension, and dyslipidemia, as well as weight loss are the only proven identified treatment options for fatty liver disease. It is crucial for patients to understand that once they progress to cirrhosis or fibrosis, the damage is irreversible (Alexander et al., 2003). It is important in clinical practice for clinicians to identify these patients at high risk for fatty liver disease in order to prevent the progression of advanced liver disease.

As the incidence of fatty liver increases because of the obesity epidemic, it is advantageous for practitioners to be aware of risk factors, current treatment guidelines, and appropriate referral parameters to gastroenterology in order to aid in managing these patients with NAFLD. Identifying the causative agent is also essential. Often, the practitioner may need to rule out hepatotoxic drugs, substances, or even other diseases that can cause liver disease in order to ensure the proper diagnosis and treatment of NAFLD. Nurse practitioners can also be the first line of defense when it comes to disease prevention. Providing patients the appropriate education is often one of the most important aspects in the prevention of NAFLD. ★

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