

NON-ALCOHOLIC STEATOHEPATITIS AND OBESITY



Diana Moya, MD

Obesity and Non-alcoholic steatohepatitis (NASH) are fascinating entities becoming more frequent in our practice. During the past two decades, there has been a dramatic increase in obesity in children and adolescents in the United States. Data from the CDC estimates that childhood obesity has more than doubled in children and tripled in adolescents in the past 30 years, and approximates 17% (12.5 million). Parental obesity is one of the main risk factors for the development of pediatric obesity. Obese adolescents have a 50 to 77% risk of becoming obese adults with an increase to approximately 80% given 1 obese parent.

Obesity during childhood carries devastating consequences including hypertension, dyslipidemia, non-alcoholic fatty liver disease (NAFLD), insulin resistance, diabetes mellitus and metabolic syndrome. Children are at greater risk for bone and joint problems, sleep apnea, precocious puberty, polycystic ovary syndrome and social and psychological problems such as poor self-esteem and bullying.

Many families, surprisingly enough, report being unaware that their child is overweight or obese. This unawareness limits interventions in a timely fashion. As physicians and medical care providers, we must warn families for any concerns about overweight and obesity at any age. Body fat is measured by Body Mass Index (BMI) based on height and weight. BMI curves are calculated from the 5th to the 95th percentile and by consensus children and adolescents are overweight or obese if the BMI exceeds the 85th or 95th percentiles respectively.

Obesity can be multifactorial involving genetic and environmental factors. In overweight and obese children, excess fat accumulates when total energy intake exceeds total energy expenditure. Other factors include genetic syndromes, hor-

monal disorders, and medications. NAFLD occurs more frequent in obese children. NAFLD is a spectrum of diseases ranging from simple steatosis to cirrhosis. Non-alcoholic steatohepatitis (NASH) is the severe form of NAFLD and is characterized by steatosis, hepatocyte injury and cell death, inflammation and collagen deposition or fibrosis of the liver. The pathogenesis of NASH is not fully understood, although metabolic derangements related to obesity, insulin resistance and oxidative stress is well known factors involved. The development of NASH is likely a “two hit” process. Fat accumulation in the hepatocytes is the suggested “first hit”. The “second hit” is related mainly to oxidative stress, and additionally mitochondrial dysfunction, pro-inflammatory cytokines, and adipokines that leads to the production of reactive oxygen species.

Most obese children with NASH are asymptomatic. Few patients may complain about fatigue and upper abdominal discomfort. Although the only finding on physical exam may be a BMI above the 85th or 95th percentiles, other findings may indicate organic etiologies of obesity. Short stature may suggest hypothyroidism, hormonal abnormalities or genetic syndrome such as Prader-Willi syndrome. Constipation or intolerance to cold may indicate hypothyroidism. Polyuria and polydipsia may suggest diabetes. Acanthosis nigricans suggests insulin resistance. Symptoms of jaundice, ascites, edema or hepatosplenomegaly may be signs of advance liver disease related to cirrhosis due to progressive NASH.

Laboratory evaluation may be challenging as no single test is used to diagnose NASH. Helpful tests includes liver function tests, gamma-glutamyl transpeptidase, fasting insulin and glucose levels, fasting lipid panel, thyroid panel and iron studies. Occasionally more specialized tests are used to rule out other causes of elevated liver enzymes such as autoimmune or infectious hepatitis, Wilson’s disease or hemochromatosis.

Abdominal ultrasound is a helpful, simple and noninvasive way to diagnose

hepatic steatosis and evaluate for portal hypertension or gallbladder disease. In patients with NASH, the liver is hyperechogenic or bright and steatosis is usually detected when more than 30% of liver has fatty changes. Other diagnostic studies also available are abdominal computed tomography and magnetic resonance. Invasive tests such as a liver biopsy should be considered in patients with suspected NASH to assess the extent of liver damage and fibrosis, define the prognosis and exclude other unsuspected causes of liver disease.

No specific treatment is available for (NASH). Lifestyle modification including weight loss, dietary changes, and exercise activity are the most important measures to slow the progression of the disease and reverse hepatic steatosis. According to the AASLD guidelines, 2-3% of weight loss generally reduces hepatic steatosis, but up to 10% weight loss may be needed to improve necroinflammation.

Recommendations for pharmacological therapies such as metformin, statins, ursodeoxycolic acid, thiazolidinediones, omega-3 fatty acids and vitamin E in children are limited and therefore not recommended for this population.

Some complications associated with NASH may include cirrhosis and its complications: variceal bleeding, ascites, encephalopathy, and liver failure. The prognosis in NASH depends on the histologic stage at presentation. The rate of progression worsens if more than one liver disease is present (alcoholic liver disease or chronic viral hepatitis).

At GI for Kids, we offer a weight management program, Bee Fit 4 Kids, for overweight and obese children and teenagers. Bee Fit comprises group and individual counseling sessions with two Registered Dietitians to discuss healthy dietary habits, an Exercise Specialist to improve physical activity habits, and a Psychologist assessing behavior modification to ensure a successful weight loss journey. Our Gastroenterologists and Nurse Practitioners also participate in this program.

NONALCOHOLIC FATTY LIVER DISEASE AND NUTRITIONAL RECOMMENDATIONS



Ashley Treadway, MS, RD, LDN

Nonalcoholic fatty liver disease (NAFLD) is characterized by the accumulation of triglycerides in the hepatocytes of patients who do not abuse alcohol. NAFLD has emerged as the leading cause of chronic liver disease in children and adolescents in the United States; it is thought to be due to the high prevalence rates of overweight and obesity. The cause of NAFLD is not clear. Certain diseases and conditions tend to increase the risk of developing NAFLD such as family history of NAFLD, high cholesterol, high triglycerides, obesity, metabolic syndrome, and type 2 diabetes. Approximately 90% of children with NAFLD are obese, defined as BMI greater than the 95% percentile for age and gender.

NAFLD is often silent, producing no symptoms, especially in the beginning. If the disease advances over time it can cause vague problems such as fatigue, weight loss, loss of appetite, weakness, nausea, and confusion.

At this time, there is no evidence-based approved drug therapy or any alternative medicine treatments proven to cure NAFLD. Although the process of NAFLD can be stopped or reversed, if lifestyle changes are not implemented cirrhosis may develop. A medical team should work to treat the risk factors and underlying conditions. Lifestyle modification through diet and exercise must be the first line therapy of any treatment plan for patients with NAFLD.

Nutritional Guidelines for NAFLD

Weight Loss	10% reduction of initial body weight over six months
	Maintenance of weight loss
Total Fat	≤35% of total calories
Monounsaturated Fatty Acids (Olive oil, Canola oil, Sunflower oil, Avocado, Peanut butter, Olives)	15% to 25% of total calories
Polyunsaturated Fatty Acids (Soybean oil, Corn oil, Safflower oil, Walnuts, Flaxseed, Fatty Fish, Soymilk, Tofu)	5% to 10% of total calories
	Increase Omega 3 fatty acids
Saturated fatty acids (Whole fat dairy, Butter, Chicken with Skin, High fat cuts of meat, Palm Oil, Fried Foods)	7% to 10% of total calories
Carbohydrates	50% of total calories
	>50% carbohydrate sources from whole grains
	Avoid high fructose corn syrup
	Added sugars <10% of total calories
Antioxidants	None
Physical Activity	≥150 minutes/week of moderate exercise or ≥75 minutes/week vigorous intensity
	Cardiovascular exercise five times a week
	Resistance training two times a week
	Decrease time spent sedentary

Today's Dietitian Vol 16 No.1

Healthy Food Options

Breakfast:

- Whole grain toast/whole grain waffle with peanut butter.
- Egg whites and turkey Bacon
- Oatmeal
- Quinoa and fruit
- Low fat yogurt
- High fiber cereal with low fat Milk

Lunch/Dinner:

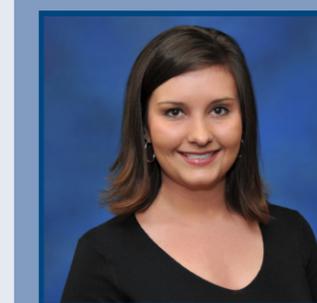
- Whole Grain pasta, veggies and chicken
- Whole wheat tortilla with veggies and hummus
- Lean turkey breast on whole grain bread
- Salad loaded with veggies, lean protein and low fat dressing
- Broth or tomato based low fat soup

Snacks:

- Edamame
- Pita Chips with salsa
- Low fat cottage cheese and fruit
- Veggies with fat free dip, hummus or guacamole
- Trail Mix with dried fruit, nuts and seeds
- Applesauce
- Fruit with Nut Spread



Meet our New Provider



Emily Jessie BSN, MSN, FNP-BC

Master of Science in Nursing, December 2013
Lincoln Memorial University, Harrogate, TN

Bachelor of Science in Nursing, May 2012
Lincoln Memorial University, Harrogate, TN

Associate of Science in Nursing, May 2011
Lincoln Memorial University, Harrogate, TN

Board Certification, January 2014
American Nurses Credentialing Center- Family Nurse Practitioner

PALS/BLS, April 2013
Pediatric Advanced Life Support, Basic Life Support

Honors/Memberships
Sigma Theta Tau International Honor Society of Nursing

Our behavior health clinicians can help your pediatric patients with:

- **GI-related disorders** including recurrent abdominal pain, food allergies, celiac disease, irritable bowel syndrome & inflammatory bowel disease, constipation & encopresis
- **Other disorders** including adjustment to illness, family dysfunction, sleep difficulties, conduct disorder, depression, generalized anxiety, panic attacks, eating disorders, non-compliance to medical regimens, and more...

Visit our website for more details: www.GIforKids.com

Call for an appointment today!

865.546.3998



transitions
BEHAVIORAL HEALTH CLINIC



GI for Kids, PLLC
East Tennessee Children's Hospital
Gastroenterology and Nutrition Services



Spring/Summer 2014

www.giforkids.com

Volume 6 Issue 4

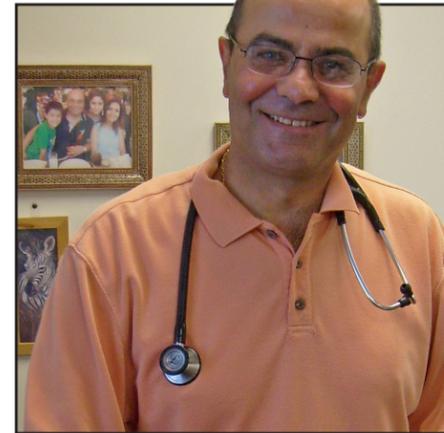
I'm sure we are all anxious for spring and warm weather. The very cold winter this year has no doubt kept many of us indoors, eating, and gaining a few pounds.

While most of us may lose these few extra pounds with increased activities Spring and warmer weather bring, many adults, adolescents, and children in this country will be at risk for more weight than is healthy. Many families are unaware of their children being overweight or obese and that they may face devastating health consequences.

Obesity and non-alcoholic steatohepatitis (NASH) is becoming a more frequent condition seen in our clinic. Many children with NASH are asymptomatic. A few may complain about fatigue and upper abdominal discomfort. The only finding on a physical exam may be a BMI above what is expected for age and gender; other findings may indicate organic etiologies of obesity.

No specific treatment is available for NASH. However, since most patients with NASH are obese, lifestyle modification is something we can provide. Our medical staff is qualified to identify children who are obese, or predisposed to obesity, and alert parents of the long term health risks. We provide counseling for dietary changes; improve physical activities, and making the necessary behavior modifications to successfully lose weight. We also provide a one-on-one weight management program called Bee Fit 4 Kids.

For more information about all of our services, please visit our website at www.giforkids.com.



Al-Tawil

Youhanna S. Al-Tawil, MD
Medical Director



BEE FIT 4 KIDS

- A one-on-one pediatric weight management program administered by a multi-disciplinary team.
- The format allows Registered Dietitians to identify nutrition and fitness trouble areas immediately. This helps the staff make appropriate changes so weight management success is maximized.

Visit our website, www.BeeFit4Kids.com, for more details, or call 865.546.3998.

Now accepting insurance!



East Tennessee Children's Hospital
Gastroenterology and Nutritional Services
Medical Office Building
2100 Clinch Avenue, #510
Knoxville, TN 37916

PRSR STD
U.S. POSTAGE
PERMIT NO. 433
KNOXVILLE, TN

5th Annual Gluten Free Vendor Fair and Expo

The Knoxville Expo Center (5441 Clinton Hwy)

Saturday, May 31, 2014 • 10 a.m. – 4 p.m.

Adults - \$5.00
Children 2 to 13 - \$3

Admission includes: free gift bag to first 1,000
Speakers and cooking demonstrations
Free samples
Products for purchase

Children 2 & under
FREE

