Does Sleeve Gastrectomy Improve NASH in Adolescents?

The complications associated with morbid obesity, including nonalcoholic steatohepatitis (NASH), have caused clinicians to consider bariatric surgery options. Only limited research on the effect of bariatric surgery in pediatric patients is available, and the authors of this study evaluated laparoscopic sleeve gastrectomy on the progression of NASH in adolescent patients with obesity.

This Italian study enrolled 164 obese adolescent patients (defined as being 13 to 17 years old and having a body mass index or BMI $\geq$ 35 kg / m^2) with liver biopsies demonstrating non-alcoholic fatty liver disease (NAFLD). Patients with a BMI greater than 40 were offered either laparoscopic sleeve gastrectomy as an initial option or lifestyle intervention with intragastric weight loss device (intragastric balloon) placement as an alternative. Patients with a BMI ranging from 35 to 40 were initially offered an intragastric weight loss device. All patients underwent liver biopsy, glucose monitoring using the homeostasis model assessment of insulin resistance (HOMA-IR), biochemical testing for lipid levels, 24-hour ambulatory blood pressure monitoring, polysomnography, and quality of life testing at baseline and at one year after therapeutic intervention. Of note, all patients had counseling with a dietician throughout the study.

In total, 20 patients underwent laparoscopic sleeve gastrectomy, 20 patients underwent intragastric device placement with lifestyle intervention, and 53 patients just had lifestyle intervention with no device placement. No major peri-operative complications occurred during the study although seven patients required replacement of their initial intragastric balloon. At one year, a significant improvement in liver histology occurred in those patients who had undergone laparoscopic sleeve gastrectomy with most patients having resolution of stage 2 fibrosis as well as resolution of NASH in those patients who had NASH on the initial liver biopsy. Similar findings were not seen in patients who had undergone intragastric device placement or lifestyle intervention. A reduction in the NAFLD activity score was correlated with reduction in body weight, BMI z-score, waist circumference, and HOMA-IR over time. In addition, weight and BMI decreased significantly only in the patients undergoing laparoscopic sleeve gastrectomy while the other interventions had no significant decrease with some of these patients gaining weight. Laparoscopic sleeve gastrectomy significantly improved hypertension, obstructive sleep apnea symptoms, dyslipidemia, glucose intolerance, and quality of life compared to the other therapeutic interventions.

This study suggests that laparoscopic sleeve gastrectomy is a safe and effective therapy to promote weight loss and improve NASH histology in adolescents with morbid obesity. It should be noted that a large percentage of patients dropped out during the study, and only a small number of patients were still be followed at one-year post-therapy. Long-term longitudinal data would be helpful; however, this study shows a promising therapy for those pediatric patients who have developed significant complications due to obesity.

Manco M, Mosca A, De Peppo F, Caccamo R, Cutrera R, Giordano U, De Stefanis C, Alisi A, Baumann U, Silecchia G, Nobili V. "The benefit of sleeve gastrectomy in obese adolescents on nonalcoholic steatohepatitis and hepatic fibrosis." The Journal of Pediatrics. 2017; 180: 31-37.

Use of Reflux Medication in Premature Infants

Gastroesophageal reflux (GER) is common in infants, including premature infants cared for in the newborn intensive care unit (NICU). There has been concern that reflux medication use has increased significantly in the pediatric population with many of these patients not necessarily requiring such medications. The authors of this study evaluated reflux medication use in premature infants during the first year of life. This retrospective study followed preterm infants (with gestational ages $\geq$ 22 weeks and $\leq$ 35 weeks) seen at a primary care network in Philadelphia. GER diagnosis was determined by evaluating the electronic medical record, and GER medication use was recorded, including histamine-2 receptor antagonists (H2RAs), proton pump inhibitors (PPIs), prokinetics (metoclopramide), and cholinergics (bethanechol). Duration of use of these medications were followed for the first 3 years of life. Specific demographic information was determined including gestational age, birth weight, ethnicity, race, sex, history of multiple gestations, history of medical complications, primary care location, and insurance type.

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Results demonstrated that 37% of infants were on GER medication in the first year of life. These infants were statistically more likely to have a lower gestational age, have private insurance, have white ethnicity, be part of a multiple gestational delivery, and have medical complications. Most of these children were on H2RAs (90%) although other medications were used including PPIs (33%), prokinetics (22%), and cholinergics (2%). The mean age for which these medications were started was 95 ± 69 days, and 40% of these infants were on more than one medication in the first year of life. It was concerning that 30% of these infants were on both a H2RA and PPI simultaneously during this study period. From an outpatient perspective, a diagnosis of a feeding problem was associated with starting GER medication, and use of more than one medication was associated with lower gestational age, feeding difficulties, asthma, supplemental oxygen use, and tube feeding. The average duration of GER medication use (if on such medication at time of NICU discharge) was 375 ± 292 days, and 43% of infants who were started on medications before 6 months of age were still on medication at one year of age. Adjusted age modeling demonstrated that lower gestational age and presence of lung disease were associated with medication use.

This study demonstrates that a large percentage of premature infants are started on GER medications in the NICU, and they often are continuing such medications at one year of age. This finding is concerning as there is little efficacy data for use of such medications in this clinical setting. Additionally, the safety of such medications in the premature infant is unknown as long-term acid suppression can be associated with changes in the microbiome, an increased risk of infections such as *Clostridium difficile*, and an increased risk of pneumonia.

D'Agostino J, Passarella M, Martin A, Lorch S. "Use of gastroesophageal medications in premature infants after NICU discharge." Pediatrics. 2016; 138: e20161977.

John Pohl, M.D., Book Editor, is on the Editorial Board of *Practical Gastroenterology*