Analysis of Bariatric Surgical Procedures in Adolescents from National Inpatient Sample

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Introduction

• Bariatric surgery is a viable treatment option for morbidly obese adolescents.
• Purpose of this study was to identify if advancement of minimally invasive surgery and increasing number of trained minimally invasive surgeons had impact on utilization of bariatric surgical procedures in children and adolescents in the era of obesity epidemics.

Methods

• We analyzed 10 years of National Inpatient Sample (NIS) throughout 2005-2014. We extracted discharges of patients <20y, with associated ICD-9 diagnosis and procedure codes of morbid obesity (278.01, V85.4), open gastric bypass (OGB- 44.31, 44.39, 43.83), laparoscopic gastric bypass (LGB- 44.38), sleeve gastrectomy (SG-43.82), laparoscopic gastric banding (LAGR- 44.95) and laparoscopic gastroplasty (LG-44.68).
• Technical and systemic surgical complications were identified using according to ICD-9 codes. All extracted numbers were weighted to national estimates. Trends and available socio-demographics were reviewed. Mean length of stay (LOS) and mean charges (MC) adjusted by inflation index were analyzed.

Results

• Throughout the analyzed years, a total number of major bariatric procedures remained relatively unchanged, with a substitution of most procedures with SG since 2011. LAGB and LG procedures have been essentially abandoned. OGB constituted only a minor portion (2.3%) of all bariatric procedures by 2014. 98% of all bariatric procedures were performed in adolescents 13-19y, and 2% in children <12y. By 2014 two of the most commonly performed bariatric procedures in adolescents were SG (64%) and LGB (29%). Review of demographics demonstrated sustained significant female (76%) vs. male (24%) predominance, with the majority of patients being white (56%), and privately insured (65%).
• Increasing number of procedures were performed in adolescents with public insurance (13.5%>30%), as well as in the least wealthy of this cohort (21%>30%). Till 2010, bariatric procedures were equally performed in teaching and non-teaching hospitals, but the majority of cases have shifted to teaching institutions (80% teaching vs. 20% non-teaching) since 2011. Our analysis identified an only non-reportable number of inpatient deaths in one of the analyzed years.
• Most common complications were hemorrhage, requiring transfusions and respiratory complications, with an overall rate ranging ~2-4%. In contrast to prior years, there have been no cardiac complications reported in adolescents since 2011, but increased incidents of acute kidney failure were observed. MC has increased and LOS has decreased over the years.

Conclusion

• Despite the above described favorable shifts in between procedure types and socioeconomics, our study did not demonstrate an increase in the utilization of weight loss surgery in adolescents. Bariatric procedures are underutilized but continuously performed in this population, following adult patient curves.
• SG has demonstrated to be safe, effective and has been extensively performed since 2011, constituting 64% of all adolescent bariatric procedures in 2014. Multidisciplinary efforts should be made to increase the identification and referral of eligible candidates for surgery.

Surgical procedure types

- Sleeve gastrectomy
- Laparoscopic gastric bypass
- Others

References

*National Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality
**Cartton WikiHow Using weight loss surgery, Chis M. MatsKo MD