Comparative efficacy of Roux-en-Y gastric bypass versus sleeve gastrectomy in children and adolescents – a systematic review and meta-analysis

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INTRODUCTION

- Recent large-scale trials have shown that Roux-en-Y gastric bypass (RYGB) results in superior weight loss outcomes compared to sleeve gastrectomy (SG) in adults
- In the adolescent population, relatively little is known about the comparative efficacy of RYGB vs SG
- We conducted a systematic review and meta-analysis comparing weight loss outcomes of RYGB and SG in the adolescent population

METHODS

- We searched Embase, MEDLINE, Web of Science, ClinicalTrials.gov and the Cochrane Central Register of Controlled Trials (CENTRAL) from inception until September 2024
- We included all **comparative** (2-arm) studies comparing **RYGB and SG** in **patients <21 years of age**
- **Primary outcome:** Postoperative BMI change at a minimum of 1-year of follow up
- **Secondary outcomes:**
  - > % change in total body weight
  - > incidence of peri/post-operative complications
- We conducted meta-analyses using a DerSimonian-Laird random effects model for continuous variables and Mantel-Haenszel random effects model for dichotomous variables
- Heterogeneity was assessed using the inconsistency (I^2) statistic, with >50% representing considerable heterogeneity
- All statistical analyses were completed on R version 4.4.3 and Cochrane Review Manager 5.4.

RESULTS

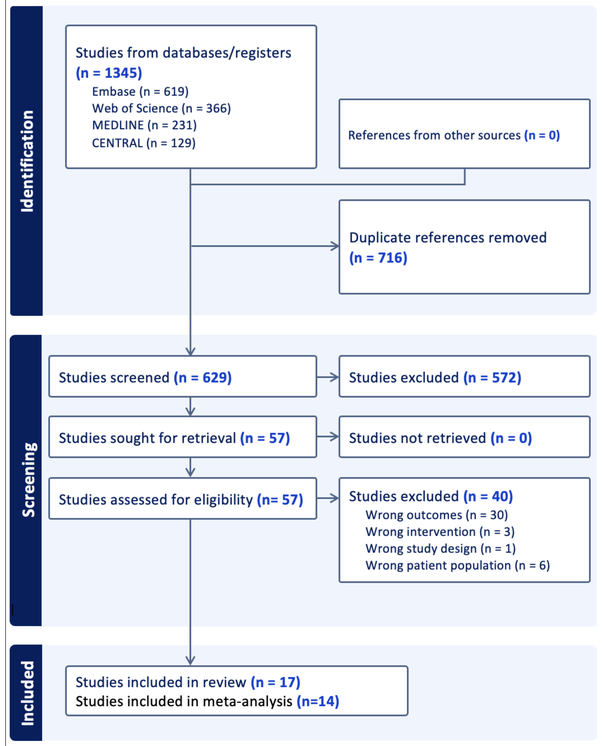


Figure 1: PRISMA diagram summarizing screening process. A total of 14 studies were included for meta-analysis, with n=11 reporting the primary outcome of post-operative BMI change.

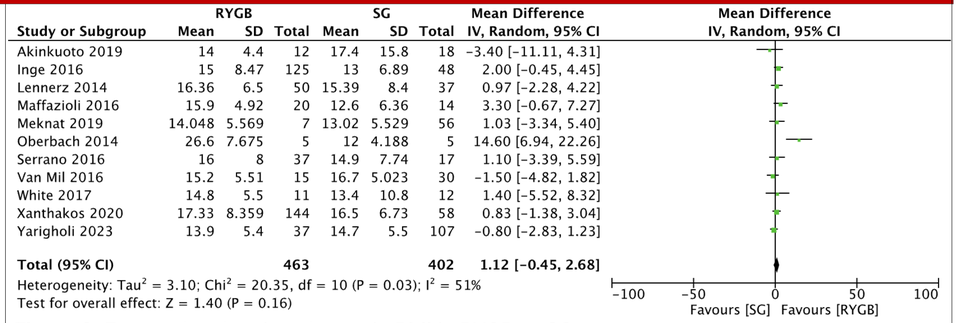


Figure 2: Forest plot showing change in BMI in RYGB vs SG

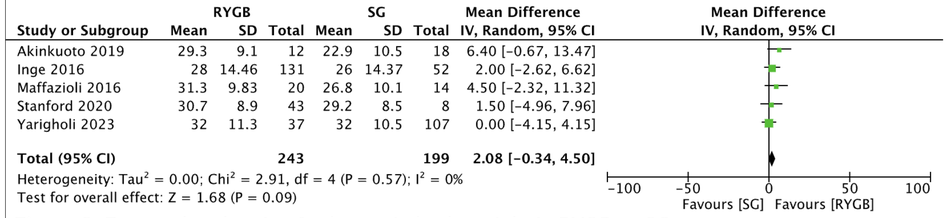


Figure 3: Forest plot showing % change in body weight in RYGB vs SG

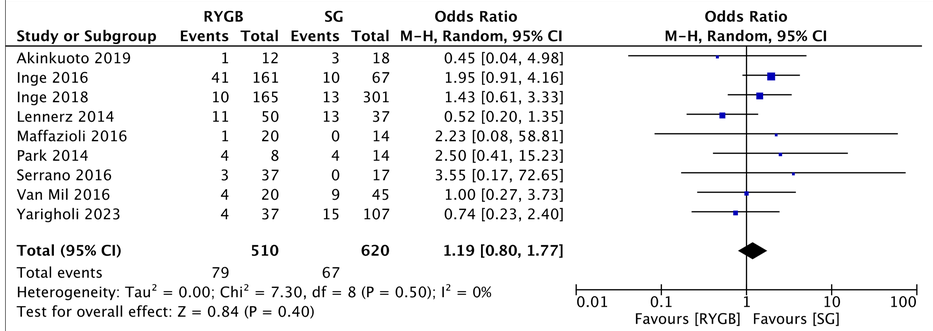


Figure 4: Forest plot showing incidence of complications in RYGB vs SG

DISCUSSION

- A total of 866 patients across 11 studies were included in our primary outcome analysis
- There was no statistically significant difference between RYGB in any of our outcomes, including postoperative change in BMI, postoperative % change in body weight, and incidence of complications
- All included studies were observational design (n=3 prospective and n=9 retrospective), which limits the quality of the results
- Though our outcomes did not reach statistical significance, there was a trend towards favoring RYGB in the MD of postoperative BMI change and % change in body weight; our findings may be limited by sample size and lack of large-scale studies in the pediatric population

KEY POINTS

1. **There was no significant difference in the change in BMI between RYGB and SG in pediatric and adolescent patients at a median follow-up of 12 months**
2. **Incidence of complications was similar between groups**
3. **Further prospective studies and randomized controlled trials comparing RYGB and SG are necessary to provide higher-quality data in the pediatric population**