**#1_Preoperative Implications of GLP-1 Receptor Agonists on Anesthesia Outcomes: A Systematic Review and Meta-Analysis**

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**Abstract**

**Background:** Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) are widely used for treating type 2 diabetes and obesity because they induce benefits like glycemic control and weight reduction. However, their further influence on perioperative anesthesia outcomes, such as gastric emptying, aspiration risk, hemodynamic stability, and glycemic variability, is a serious concern. This systematic review and meta-analysis evaluate the insights regarding the preoperative consequences of GLP-1 RA on anesthesia outcomes, leading to a better guide for perioperative management strategies.

**Methods:** A systematic literature search was performed across PubMed, Web of Science, Cochrane Library, ClinicalTrials.gov, OpenGrey, and Embase. From the 524 records screened, only six eligible studies met the inclusion criteria and were analyzed. These studies investigated gastric food retention, aspiration risk, perioperative blood pressure changes, glycemic stability, nausea and vomiting, and vasopressor requirements. Statistical analysis was conducted using Open Meta-Analyst and Review Manager 5. The Cochrane Risk of Bias (RoB 1) tool was used for randomized controlled trials (RCTs), while the Newcastle-Ottawa Scale (NOS) assessed observational study quality.

**Results:** The use of GLP-1 receptor agonists (GLP-1 RAs) significantly increases the risk of gastric food retention (OR: 1.39 [1.25-1.56]; $p<0.00001$; $I^2=95\%$), with a 25.69-fold higher risk during elective EGD (OR: 25.69 [7.34-89.99]). Endoscopy discontinuation due to retained gastric contents was 37% more likely (OR: 1.37 [1.23-1.53]; $p<0.00001$). No significant increase in pulmonary aspiration risk was observed. GLP-1 RA use was associated with a reduction in mean arterial blood pressure (-2.76 mmHg [95% CI: -3.22, -2.30]; $p<0.00001$; $I^2=89\%$), leading to increased intraoperative vasopressor requirements (OR: 1.48 [1.09-1.99]; $p=0.01$). Perioperative glycemic control improved (mean glucose reduction: -14.93 mg/dL [95% CI: -15.81, -14.05]; $p<0.00001$). Postoperative nausea and vomiting were more frequent (OR: 1.37 [0.95-

1.97]; p=0.09), anesthesia duration extended by 9.86 min (95% CI: 9.12-10.59), and recovery prolonged by 10.01 min (95% CI: 9.42-10.61), with increased ICU admissions (OR: 1.53 [1.01-2.32]; p=0.04). Sensitivity analysis confirmed result robustness.

**Conclusions:** GLP-1 RAs delay gastric emptying, resulting in extended fasting protocols or gastric ultrasound evaluations concerning the aspiration risk. Their vasodilatory effects may result in hypotension during the perioperative phase, often warranting the use of vasopressors and modification of anesthesia techniques. While they stabilize sugar levels, they may also contribute to postoperative nausea and vomiting (PONV), thereby necessitating modifications in antiemetic guidelines. These observations support the need for personalized perioperative management strategies for users of GLP-1 RAs.

**Keywords:** GLP-1 receptor agonists, anesthesia outcomes, gastric emptying, perioperative glycemic control, vasopressor use, aspiration risk.