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PERIOPERATIVE MEDICINE IN A NUTSHELL

Glucagon-Like Peptide-1 Receptor Agonists in the Peri-Operative Period

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Abstract

Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) are emerging as an important class of drugs in the management of Type 2 Diabetes Mellitus (T2DM) and obesity. There are rising concerns of pulmonary aspiration with these medications due to drug-induced gastroparesis. While definitive association is uncertain, it is essential to be prudent and manage these patients as per the current evidence and recommendations.

Key words: GLP-1 receptor agonists; perioperative; anaesthesia

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Introduction

Glucagon-like peptide-1 (GLP-1) is a short acting intestinal incretin secreted by L-cells in terminal ileum and proximal colon in response to glucose load and triglycerides. It acts via cAMP-linked GLP-1 receptors in pancreas and exerts glucose lowering effects by stimulation of insulin release and suppression of glucagon secretion. GLP-1 also delays gastric emptying leading to a prolonged feeling of fullness and reduces food intake through appetite suppression via receptors in the stomach and hypothalamus respectively.

Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) are analogues of endogenous GLP-1 with similar pharmacodynamic effects, albeit with an increased duration of action. The first approved GLP-1 RA was exenatide. Since then, multiple congeners have been developed with molecular modifications to increase duration of action by prolonged elimination half-lives and greater protein-binding. Examples of GLP-1 RAs in use currently include daily liraglutide, weekly exenatide, semaglutide, dulaglutide and albiglutide. Apart from glucose-lowering effects, newer drugs have also demonstrated reduction in atherothrombotic events and revascularisation procedures along with positive effects on renal function in patients with Type 2 Diabetes Mellitus (T2DM) (Ferhatbegović et al, 2023).

Concerns and Current Recommendations

Case reports of vomiting after induction (Weber et al, 2023), pulmonary aspiration (Gulak and Murphy, 2023) and cancellation of procedure following demonstration of solid gastric contents (Beam and Hunter Guevara, 2023) despite fasting

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have raised concerns about risk of pulmonary aspiration in patients on GLP-1 RAs. A retrospective study on patients undergoing esophagogastroduodenoscopy (Silveira et al, 2023) also found increased residual gastric contents in patients taking semaglutide, a long acting GLP-1 RA.

A recent update from the American Society of Anesthesiologists Task Force on Pre-operative Fasting (Joshi et al, 2023) advise withholding GLP-1 RAs for elective procedures irrespective of the indication for their use, dose or type of procedure. If patients reported gastro-intestinal symptoms such as severe nausea, vomiting, retching, or abdominal bloating on the day of surgery, they advise delaying the elective procedure. If the drug was not withheld and procedure was essential, they propose using 'full stomach' precautions or gastric ultrasound to evaluate gastric volume. Recommendations from various authors also include eliciting thorough history during pre-operative assessment about indication, initiation and dosing of GLP-1RAs; pre-existing comorbidities that increase risk of gastroparesis and aspiration including longstanding diabetes; and use of other medications which slow down gastric emptying such as opioids, proton pump inhibitors and tricyclic antidepressants. They suggest cessation of GLP-1 RAs for weight loss and consultation with endocrinologist for possible cessation and bridging in T2DM, the recommended period of cessation being three half-lives (Jones et al, 2023; Milder et al, 2024).

These strategies are, however, associated with limitations. Firstly, there is no definitive evidence associating GLP-1 RAs to pulmonary aspiration. Patients with poorly controlled/long-standing diabetes with autonomic neuropathy are known to have delayed gastric emptying. Secondly, tachyphylaxis and tolerance to GLP-1 RAs with return of gastric emptying to baseline have been reported (Hulst et al, 2021). Finally, there is insufficient evidence that stopping reduces the risk of gastroparesis. Therefore, stopping GLP-1 RAs would affect glycaemic control and potentially increase risk of postoperative complications (Ushakumari and Sladen, 2024).

Current guidelines from Association of Anaesthetists, Joint British Diabetes Society and Centre for Perioperative Care recommend continuing GLP-1 RAs as per patients' normal regime while exercising caution for gastroparesis. Available evidence and reviews support implementation of aspiration risk mitigation strategies such as use of prokinetics, gastric ultrasound, rapid sequence induction if GLP-1 RAs cannot be withheld and careful patient selection for sedation (Milder et al, 2024).

Conclusion

As the use of GLP-1 RAs increase, anaesthetists are more likely to be involved in peri-operative care of patients on these medications. It is essential that anaesthetists are aware of gastroparesis as a recognised adverse effect of GLP-1 RAs and formulate pragmatic patient-specific management plans that involve clinical assessment, risk stratification and appropriate mitigation strategies to reduce the risk of pulmonary aspiration till further definitive evidence is available.

Availability of Data and Materials

Not applicable.

Author Contributions

PN is the sole author and has made substantial contributions to conception, design, drafting and revision of the manuscript. PN has given approval for the final version to be published and is accountable for all aspects of the work.

Ethics Approval and Consent to Participate

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Conflict of Interest

The author declares no conflict of interest.

References

Beam WB, Hunter Guevara LR. Are serious anesthesia risks of semaglutide and other GLP-1 agonists under-recognized? Case reports of retained solid gastric contents in patients undergoing anestheia. APSF Newsletter. 2023; 38: 67, 69–71.

Ferhatbegović L, Mršić D, Macić-Džanković A. The benefits of GLP1 receptors in cardiovascular diseases. Frontiers in Clinical Diabetes and Healthcare. 2023; 4: 1293926. https://doi.org/10.3389/fcdhc.2023.1293926

Gulak MA, Murphy P. Regurgitation under anesthesia in a fasted patient prescribed semaglutide for weight loss: a case report. Canadian Journal of Anaesthesia. 2023; 70: 1397–1400. https://doi.org/10.1007/s12630-023-02521-3

Hulst AH, Polderman JAW, Siegelaar SE, van Raalte DH, DeVries JH, Preckel B, et al. Preoperative considerations of new long-acting glucagon-like peptide-1 receptor agonists in diabetes mellitus. British Journal of Anaesthesia. 2021; 126: 567–571. https://doi.org/10.1016/j.bja.2020.10.023

Jones PM, Hobai IA, Murphy PM. Anesthesia and glucagon-like peptide-1 receptor agonists: proceed with caution! Canadian Journal of Anaesthesia. 2023; 70: 1281–1286. https://doi.org/10.1007/s12630-023-02550-y

Joshi GP, Abdelmalak BB, Weigel WA, Soriano SG, Harbell MW, Kuo CI, et al. American Society of Anesthesiologists consensus-based guidance on preoperative management of patients (adults and children) on glucagon-like peptide-1 (GLP-1) receptor agonists. 2023. Available at: https://www.asahq.org/about-asa/newsroom/news-releases/2023/06/american-society-of-anesthesiologists-consensus-based-guidance-on-preoperative (Accessed: 20 July 2024).

Milder DA, Milder TY, Liang SS, Kam PCA. Glucagon-like peptide-1 receptor agonists: a narrative review of clinical pharmacology and implications for peri-operative practice. Anaesthesia. 2024; 79: 735–747. https://doi.org/10.1111/anae.16306

Silveira SQ, da Silva LM, de Campos Vieira Abib A, de Moura DTH, de Moura EGH, Santos LB, et al. Relationship between perioperative semaglutide use and residual gastric content: A retrospective analysis of patients undergtoing elective upper endoscopy. Journal of Clinical Anesthesia. 2023; 87: 111091. https://doi.org/10.1016/j.jclinane.2023.111091

Ushakumari DS, Sladen RN. ASA Consensus-based Guidance on Preoperative Management of Patients on Glucagon-like Peptide-1 Receptor Agonists. Anesthesiology. 2024; 140: 346–348. https://doi.org/10.1097/ALN.0000000000004776

Weber M, Siddarthan I, Mack PF. Clinically significant emesis in a patient taking a long-acting GLP-1 receptor agonist for weight loss. British Journal of Anaesthesia. 2023; 131: e37–e39. https://doi.org/10.1016/j.bja.2023.05.005