ISSN 1948-5190 (online)

World Journal of *Gastrointestinal Endoscopy*

World J Gastrointest Endosc 2024 June 16; 16(6): 273-375

Published by Baishideng Publishing Group Inc

World Journal of Gastrointestinal Endoscopy

Contents

Monthly Volume 16 Number 6 June 16, 2024

EDITORIAL

MINIREVIEWS

ORIGINAL ARTICLE

Retrospective Study

Observational Study

World Journal of Gastrointestinal Endoscopy

Monthly Volume 16 Number 6 June 16, 2024

Contents

World Journal of Gastrointestinal Endoscopy

Monthly Volume 16 Number 6 June 16, 2024

Contents

NAME OF JOURNAL
World Journal of Gastrointestinal Endoscopy

ISSN
ISSN 1948-5190 (online)

LAUNCH DATE
October 15, 2009

FREQUENCY
Monthly

EDITORS-IN-CHIEF
Anastasios Koulaouzidis, Bing Hu, Sang Chul Lee, JooYoung Cho

EDITORIAL BOARD MEMBERS
https://www.wjgnet.com/1948-5190/editorialboard.htm

PUBLICATION DATE
June 16, 2024

PUBLISHING PARTNER
Digestive Endoscopy Center of West China Hospital, SCU

INSTRUCTIONS TO AUTHORS
https://www.wjgnet.com/bpg/gerinfo/204

GUIDELINES FOR ETHICS DOCUMENTS
https://www.wjgnet.com/bpg/GerInfo/287

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH
https://www.wjgnet.com/bpg/gerinfo/240

PUBLICATION ETHICS
https://www.wjgnet.com/bpg/GerInfo/288

PUBLICATION MISCONDUCT
https://www.wjgnet.com/bpg/gerinfo/208

ARTICLE PROCESSING CHARGE
https://www.wjgnet.com/bpg/gerinfo/242

STEPS FOR SUBMITTING MANUSCRIPTS
https://www.wjgnet.com/bpg/GerInfo/239

ONLINE SUBMISSION
https://www.f6publishing.com

PUBLISHING PARTNER's OFFICIAL WEBSITE
http://www.cd120.com/index.html

World Journal of Gastrointestinal Endoscopy

Submit a Manuscript: https://www.f6publishing.com

World J Gastrointest Endosc 2024 June 16; 16(6): 292-296

DOI: 10.4253/wjge.v16.i6.292

ISSN 1948-5190 (online)

EDITORIAL

Impact of glucagon-like peptide receptor agonists on endoscopy and its preoperative management: Guidelines, challenges, and future directions

Sahib Singh, Vishnu Charan Suresh Kumar, Ganesh Aswath

Specialty type: Gastroenterology and hepatology

Provenance and peer review: Invited article; Externally peer reviewed.

Peer-review model: Single blind

Peer-review report's classification

Scientific Quality: Grade C

Novelty: Grade B

Creativity or Innovation: Grade B

Scientific Significance: Grade B

P-Reviewer: Cerwenka H, Austria

Received: March 1, 2024

Revised: April 28, 2024

Accepted: May 13, 2024

Published online: June 16, 2024

Sahib Singh, Department of Internal Medicine, Sinai Hospital, Baltimore, MD 21215, United States

Vishnu Charan Suresh Kumar, Ganesh Aswath, Division of Gastroenterology and Hepatology, State University of New York Upstate Medical University, Syracuse, NY 13210, United States

Corresponding author: Vishnu Charan Suresh Kumar, MBBS, Academic Research, Doctor, Division of Gastroenterology and Hepatology, State University of New York Upstate Medical University, 750 E Adams St, Syracuse, NY 13210, United States. drvishnucharan@gmail.com

Abstract

Glucagon-like peptide receptor agonists (GLP-1RA) are used to treat type 2 diabetes mellitus and, more recently, have garnered attention for their effectiveness in promoting weight loss. They have been associated with several gastrointestinal adverse effects, including nausea and vomiting. These side effects are presumed to be due to increased residual gastric contents. Given the potential risk of aspiration and based on limited data, the American Society of Anesthesiologists updated the guidelines concerning the preoperative management of patients on GLP-1RA in 2023. They included the duration of mandated cessation of GLP-1RA before sedation and usage of "full stomach" precautions if these medications were not appropriately held before the procedure. This has led to additional challenges, such as extended waiting time, higher costs, and increased risk for patients. In this editorial, we review the current societal guidelines, clinical practice, and future directions regarding the usage of GLP-1RA in patients undergoing an endoscopic procedure.

Key Words: Glucagon-like peptide receptor agonists; Endoscopy; Adverse events; Intubation; Aspiration; Semaglutide; Healthcare burden; Guidelines

Core Tip: Glucagon-like peptide-1 receptor agonists can cause delay in gastric emptying. While the American Society of Anesthesiologists recommend holding these medications prior to all procedures, the American Gastroenterological Association recommends individualized approach prior to endoscopy due to inconclusive clinical data.

Citation: Singh S, Suresh Kumar VC, Aswath G. Impact of glucagon-like peptide receptor agonists on endoscopy and its preoperative management: Guidelines, challenges, and future directions. *World J Gastrointest Endosc* 2024; 16(6): 292-296
URL: https://www.wjgnet.com/1948-5190/full/v16/i6/292.htm
DOI: https://dx.doi.org/10.4253/wjge.v16.i6.292

INTRODUCTION

Glucagon-like peptide-1 receptor agonists (GLP-1RAs) are approved for treating diabetes mellitus (DM) and obesity[1-3]. These medications stimulate insulin secretion, which improves glucose control and delays gastric emptying. The exact mechanism by which GLP-1RA affects gastrointestinal motility is not fully understood, but it appears to be neurally mediated. GLP-1RA has been shown to inhibit gastropancreatic function by interfering with central parasympathetic outflow. Gastrointestinal adverse events are common with GLP-1RAs, such as nausea and vomiting, with an increased risk of gastroparesis, pancreatitis, and bowel obstruction[4,5]. However, the favorable use profile of GLP-1RAs is evident in their rapidly increasing adoption[6].

One of the upcoming implications of GLP-1RAs is their effect on gastric emptying in the perioperative period[7-10]. Despite the standard fasting duration, patients on GLP-1RAs are reported to have high amounts of residual gastric content, increasing the risk of intraoperative aspiration[8]. In addition to the delayed gastric emptying, GLP-1RAs also reduce duodenal and small intestine motility, with variable effect depending on the presence or absence of diabetic neuropathy associated dysautonomia[11]. Furthermore, the observed rate of aspiration during upper gastrointestinal endoscopies in patients on GLP-1RAs has been low in the clinical studies[12,13]. Regardless, the recent American Society of Anesthesiologists (ASA) guideline recommends holding GLP-1RAs either on the day of the procedure (for daily dosing) or a week prior to the procedure (for weekly dosing)[14-16]. On the contrary, gastrointestinal societies have recommended individualized approaches when considering endoscopy in this subset of patients[17,18]. In the following editorial, we review the current societal guidelines, clinical practice, and future directions regarding the usage of GLP-1RAs in patients undergoing an endoscopic procedure.

CURRENT EVIDENCE

In a recent single center retrospective study by Silveira *et al*[8], the effect of perioperative semaglutide use on residual gastric content was assessed in patients undergoing upper endoscopy[8]. A significantly higher number of patients on semaglutide were found to have increased residual gastric content as compared to the control group (24.2% *vs* 5.1%). Interestingly, patients with and without increased residual gastric content had similar time of preoperative semaglutide interruption (around 10 d). Furthermore, no correlation was found between semaglutide use and the 'amount' of residual gastric content. Only 1 out of 33 patients on semaglutide reported to have pulmonary aspiration. It is worthwhile noting that semaglutide had these effects despite the patients having an average fasting interval of 9.3 h (clear fluids) and 14.5 h (solids), which is longer than the recommended fasting periods[19]. The findings of this study were replicated in case reports and another matched pair case-control study with higher incidence of gastric residue in patients taking GLP-1RAs (5.4% *vs* 0.49%)[10,20].

In addition to upper endoscopy, the delayed gastrointestinal motility observed with GLP-1RAs affects bowel preparation during colonoscopy as well[21]. In a retrospective case-control study of 333 patients, the Boston Bowel Preparation Scale was noted to be numerically lower in patients on GLP-1RAs[21]. An important point to consider, however, was the significantly higher number of patients with diabetes in the GLP-1RA group, which can itself cause suboptimal bowel preparation[22].

Not all the evidence implicates GLP-1RAs as a negative predictor of outcomes in patients undergoing endoscopies. In a retrospective cohort study with matched controls, Stark *et al*[13] found no significant difference in retained food on upper endoscopy between patients treated with and without GLP-1RAs (95%CI: 0.87-20.34)[13]. Additionally, the correlation of residual gastric content with actual pulmonary aspiration events remains unclear. Anazco *et al*[12] reported only 2 cases of pulmonary aspiration among 4134 endoscopies in patients on GLP-1RAs, equivalent to a rate of 4.8 events per 10000 endoscopies[12]. This is similar to the previously reported overall rate of 4.6 aspiration events per 10000 endoscopies, irrespective of the type of medications or comorbidities[23]. Nevertheless, the effect of GLP-1RAs in the perioperative period continues to be explored as it pertains to procedures other than endoscopies as well[24,25].

GUIDELINES

The ASA Task Force on Preoperative Fasting released the following recommendations for patients on GLP-1RAs: (1) For urgent or emergent procedures, the patients are to be managed as if they are 'full stomach'; (2) For elective procedures, GLP-1RAs are to be held either on the day of the procedure (for daily dosing) or a week prior to the procedure (for weekly dosing); (3) These guidelines are suggested irrespective of the dose/indication for GLP-1RAs and the type of procedure; and (4) If the GLP-1RAs were not held as advised for elective procedures, then the patients are to be considered 'full stomach'[14].

Immediately after the release of ASA recommendations, a multi-society statement was released by American Gastroenterological Association, American Association for the Study of Liver Diseases, American College of Gastroenterology, American Society for Gastrointestinal Endoscopy, and North American Society For Pediatric Gastroenterology, Hepatology & Nutrition[26]. Given the conflicting results from clinical studies regarding the risk of aspiration and gastroparesis due to GLP-1RAs, along with the possibility of such effects being dose or indication dependent, the societies concluded that there is insufficient data to support stopping GLP-1RAs before elective endoscopy.

Hence, an individualized approach was advised based on the patient factors such as indication for taking GLP-1RAs, whether symptomatic, urgency of the endoscopy, and whether the standard fasting period was observed[17]. First, a single dose of GLP-1RAs could be held if the indication for use is weight loss, although it is unclear if the gastric motility will improve on holding a single dose. On the contrary, if the GLP-1RA is being prescribed for DM, holding it can expose the patient to the risk of hyperglycemia, which can itself lead to adverse procedural outcomes[27]. Second, transabdominal ultrasonography can be performed in symptomatic patients with suspected residual gastric content[28]. Third, rapid-sequence intubation can be considered in symptomatic patients where endoscopy cannot be delayed. Fourth, instead of stopping GLP-1RAs, the patients can be placed on liquid diet on the day before the procedure, especially as a prior study showed protective effect of combined upper and lower endoscopies against residual gastric content likely due to consumption of liquid diet the day prior[8].

CLINICAL IMPLICATIONS

The differences in recommendations between ASA and gastroenterology societies have a potential to impact clinical decision making in patients needing endoscopies. As such, the use of GLP-1RAs has been less persistent in DM/obese patients in real world studies[29]. Adding to that, stopping GLP-1RAs regardless of the type of procedure may cause more harm than benefit by causing poor glucose control and averting the cardioprotective benefits of GLP-1RAs. There are many factors that need to be considered when interpreting the currently available evidence: (1) Acetaminophen absorption test has been used in many studies for measuring gastric emptying. However, it is not the gold standard and is not reliable; (2) long-acting GLP-1RAs affect gastric motility less than short-acting GLP-1RAs; and (3) possible tachyphylaxis exists with GLP-1RAs as the effect on gastric motility decreases with increasing dose or duration[16,30,31].

CONCLUSION

In conclusion, managing GLP-1RAs in the perioperative period may not be as simple as other non-insulin glucose-lowering agents. While the ASA guidelines may hold true for other procedures/surgeries regarding holding of GLP-1RAs, the same may not apply to endoscopies given the lack of conclusive data and different levels of sedation required in various procedures. We concur with the statement by gastroenterology societies in terms of an individualized approach to GLP-1RAs before endoscopies. This may change with time as newer and larger studies become available in the future assessing the direct impact of perioperative use of GLP-1RAs on patient outcomes.

FOOTNOTES

Author contributions: Singh S and Suresh Kumar VC contributed equally to this paper; Suresh Kumar VC and Aswath G designed the overall concept and outline of the manuscript; Singh S contributed to the discussion and design of the manuscript; Singh S and Suresh Kumar VC contributed to the writing, and editing the manuscript, illustrations, and review of literature; Aswath G contributed to the writing and editing of the manuscript.

Conflict-of-interest statement: All the authors report no relevant conflicts of interest for this article.

Country of origin: United States

ORCID number: Vishnu Charan Suresh Kumar 0000-0002-9472-2869; Ganesh Aswath 0000-0002-1354-9225.

Corresponding Author's Membership in Professional Societies: American Gastroenterological Association; American Society for Gastrointestinal Endoscopy; American College of Gastroenterology.

S-Editor: Li L
L-Editor: A
P-Editor: Cai YX

REFERENCES

1 **Collins L**, Costello RA. Glucagon-Like Peptide-1 Receptor Agonists. 2023 Jan 13. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan- [PMID: 31855395]
2 **Ussher JR**, Drucker DJ. Glucagon-like peptide 1 receptor agonists: cardiovascular benefits and mechanisms of action. *Nat Rev Cardiol* 2023; **20**: 463-474 [PMID: 36977782 DOI: 10.1038/s41569-023-00849-3]
3 **Lincoff AM**, Brown-Frandsen K, Colhoun HM, Deanfield J, Emerson SS, Esbjerg S, Hardt-Lindberg S, Hovingh GK, Kahn SE, Kushner RF, Lingvay I, Oral TK, Michelsen MM, Plutzky J, Tornøe CW, Ryan DH; SELECT Trial Investigators. Semaglutide and Cardiovascular Outcomes in Obesity without Diabetes. *N Engl J Med* 2023; **389**: 2221-2232 [PMID: 37952131 DOI: 10.1056/NEJMoa2307563]
4 **Wharton S**, Davies M, Dicker D, Lingvay I, Mosenzon O, Rubino DM, Pedersen SD. Managing the gastrointestinal side effects of GLP-1 receptor agonists in obesity: recommendations for clinical practice. *Postgrad Med* 2022; **134**: 14-19 [PMID: 34775881 DOI: 10.1080/00325481.2021.2002616]
5 **Sodhi M**, Rezaeianzadeh R, Kezouh A, Etminan M. Risk of Gastrointestinal Adverse Events Associated With Glucagon-Like Peptide-1 Receptor Agonists for Weight Loss. *JAMA* 2023; **330**: 1795-1797 [PMID: 37796527 DOI: 10.1001/jama.2023.19574]
6 **Watanabe JH**, Kwon J, Nan B, Reikes A. Trends in glucagon-like peptide 1 receptor agonist use, 2014 to 2022. *J Am Pharm Assoc (2003)* 2024; **64**: 133-138 [PMID: 37821008 DOI: 10.1016/j.japh.2023.10.002]
7 **Klein SR**, Hobai IA. Semaglutide, delayed gastric emptying, and intraoperative pulmonary aspiration: a case report. *Can J Anaesth* 2023; **70**: 1394-1396 [PMID: 36977934 DOI: 10.1007/s12630-023-02440-3]
8 **Silveira SQ**, da Silva LM, de Campos Vieira Abib A, de Moura DTH, de Moura EGH, Santos LB, Ho AM, Nersessian RSF, Lima FLM, Silva MV, Mizubuti GB. Relationship between perioperative semaglutide use and residual gastric content: A retrospective analysis of patients undergoing elective upper endoscopy. *J Clin Anesth* 2023; **87**: 111091 [PMID: 36870274 DOI: 10.1016/j.jclinane.2023.111091]
9 **Fujino E**, Cobb KW, Schoenherr J, Gouker L, Lund E. Anesthesia Considerations for a Patient on Semaglutide and Delayed Gastric Emptying. *Cureus* 2023; **15**: e42153 [PMID: 37602101 DOI: 10.7759/cureus.42153]
10 **Raven LM**, Stoita A, Feller RB, Brown C, Greenfield JR. Delayed Gastric Emptying with Perioperative Use of Glucagon-like Peptide-1 Receptor Agonists. *Am J Med* 2023; **136**: e233-e234 [PMID: 37567375 DOI: 10.1016/j.amjmed.2023.07.016]
11 **Nakatani Y**, Maeda M, Matsumura M, Shimizu R, Banba N, Aso Y, Yasu T, Harasawa H. Effect of GLP-1 receptor agonist on gastrointestinal tract motility and residue rates as evaluated by capsule endoscopy. *Diabetes Metab* 2017; **43**: 430-437 [PMID: 28648835 DOI: 10.1016/j.diabet.2017.05.009]
12 **Anazco D**, Fansa S, Hurtado MD, Camilleri M, Acosta A. Low Incidence of Pulmonary Aspiration During Upper Endoscopy in Patients Prescribed a Glucagon-Like Peptide 1 Receptor Agonist. *Clin Gastroenterol Hepatol* 2023 [PMID: 38043694 DOI: 10.1016/j.cgh.2023.11.024]
13 **Stark JE**, Cole JL, Ghazarian RN, Klass MJ. Impact of Glucagon-Like Peptide-1 Receptor Agonists (GLP-1RA) on Food Content During Esophagogastroduodenoscopy (EGD). *Ann Pharmacother* 2022; **56**: 922-926 [PMID: 34726082 DOI: 10.1177/10600280211055804]
14 **Joshi GP**, Abdelmalak BB, Weigel WA, Soriano SG, Harbell MW, Kuo CI, Stricker PA, Domino KB; American Society of Anesthesiologists Task Force on Preoperative Fasting. American Society of Anesthesiologists Consensus-Based Guidance on Preoperative Management of Patients (Adults and Children) on Glucagon-Like Peptide-1 (GLP-1) Receptor Agonists. Jun 29, 2023. [cited 3 May 2024]. Available from: https://www.asahq.org/about-asa/newsroom/news-releases/2023/06/american-society-of-anesthesiologists-consensus-based-guidance-on-preoperative
15 **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 [PMID: 37982170 DOI: 10.1097/ALN.0000000000004776]
16 **Joshi GP**. Anesthetic Considerations in Adult Patients on Glucagon-Like Peptide-1 Receptor Agonists: Gastrointestinal Focus. *Anesth Analg* 2024; **138**: 216-220 [PMID: 37874648 DOI: 10.1213/ANE.0000000000006810]
17 **Hashash JG**, Thompson CC, Wang AY. AGA Rapid Clinical Practice Update on the Management of Patients Taking GLP-1 Receptor Agonists Prior to Endoscopy: Communication. *Clin Gastroenterol Hepatol* 2024; **22**: 705-707 [PMID: 37944573 DOI: 10.1016/j.cgh.2023.11.002]
18 **Camilleri M**, Lupianez-Merly C. Effects of GLP-1 and Other Gut Hormone Receptors on the Gastrointestinal Tract and Implications in Clinical Practice. *Am J Gastroenterol* 2023 [PMID: 37753925 DOI: 10.14309/ajg.0000000000002519]
19 Practice Guidelines for Preoperative Fasting and the Use of Pharmacologic Agents to Reduce the Risk of Pulmonary Aspiration: Application to Healthy Patients Undergoing Elective Procedures: An Updated Report by the American Society of Anesthesiologists Task Force on Preoperative Fasting and the Use of Pharmacologic Agents to Reduce the Risk of Pulmonary Aspiration. *Anesthesiology* 2017; **126**: 376-393 [PMID: 28045707 DOI: 10.1097/ALN.0000000000001452]
20 **Kobori T**, Onishi Y, Yoshida Y, Tahara T, Kikuchi T, Kubota T, Iwamoto M, Sawada T, Kobayashi R, Fujiwara H, Kasuga M. Association of glucagon-like peptide-1 receptor agonist treatment with gastric residue in an esophagogastroduodenoscopy. *J Diabetes Investig* 2023; **14**: 767-773 [PMID: 36919944 DOI: 10.1111/jdi.14005]
21 **Yao R**, Gala KS, Ghusn W, Abboud DM, Wallace FK, Vargas EJ. Effect of Glucagon-Like Peptide-1 Receptor Agonists on Bowel Preparation for Colonoscopy. *Am J Gastroenterol* 2024 [PMID: 37856247 DOI: 10.14309/ajg.0000000000002564]
22 **Chirila A**, Nguyen ME, Tinmouth J, Halperin IJ. Preparing for Colonoscopy in People with Diabetes: A Review with Suggestions for Clinical Practice. *J Can Assoc Gastroenterol* 2023; **6**: 26-36 [PMID: 36789141 DOI: 10.1093/jcag/gwac035]
23 **Bohman JK**, Jacob AK, Nelsen KA, Diedrich DA, Smischney N, Olatoye O, Molitor R, Oblizajek NR, Hanson AC, Buttar NS. Incidence of

Gastric-to-Pulmonary Aspiration in Patients Undergoing Elective Upper Gastrointestinal Endoscopy. *Clin Gastroenterol Hepatol* 2018; **16**: 1163-1164 [PMID: 29155354 DOI: 10.1016/j.cgh.2017.11.024]

24 **Raven LM**, Brown C, Greenfield JR. Considerations of delayed gastric emptying with peri-operative use of glucagon-like peptide-1 receptor agonists. *Med J Aust* 2024; **220**: 14-16 [PMID: 38009941 DOI: 10.5694/mja2.52170]

25 **Jacofsky DJ**, Springer BD, Mont MA, Ushakumari DS, Sladen RN. The Impact of Glucagon-Like Peptide-1 Agonists on Hip and Knee Arthroplasty and Perioperative Considerations. *J Arthroplasty* 2023 [PMID: 38070716 DOI: 10.1016/j.arth.2023.12.002]

26 **American Gastroenterological Association**. No data to support stopping GLP-1 agonists prior to elective endoscopy. Aug 11, 2023. [cited 3 May 2024]. Available from: https://gastro.org/news/gi-multi-society-statement-regarding-glp-1-agonists-and-endoscopy/

27 **Duggan EW**, Carlson K, Umpierrez GE. Perioperative Hyperglycemia Management: An Update. *Anesthesiology* 2017; **126**: 547-560 [PMID: 28121636 DOI: 10.1097/ALN.0000000000001515]

28 **Shi J**, Shen H, Gao Q, Mulmi Shrestha S, Tan J, Lu T, Yang B. Evaluation of gastric emptying in patients with gastroparesis by three-dimensional ultrasound. *Ann Transl Med* 2021; **9**: 1343 [PMID: 34532480 DOI: 10.21037/atm-21-3972]

29 **Palanca A**, Ampudia-Blasco FJ, Calderón JM, Sauri I, Martinez-Hervás S, Trillo JL, Redón J, Real JT. Real-World Evaluation of GLP-1 Receptor Agonist Therapy Persistence, Adherence and Therapeutic Inertia Among Obese Adults with Type 2 Diabetes. *Diabetes Ther* 2023; **14**: 723-736 [PMID: 36847952 DOI: 10.1007/s13300-023-01382-9]

30 **Cohen J**, Aharon A, Singer P. The paracetamol absorption test: a useful addition to the enteral nutrition algorithm? *Clin Nutr* 2000; **19**: 233-236 [PMID: 10952793 DOI: 10.1054/clnu.2000.0097]

31 **Madsbad S**. Review of head-to-head comparisons of glucagon-like peptide-1 receptor agonists. *Diabetes Obes Metab* 2016; **18**: 317-332 [PMID: 26511102 DOI: 10.1111/dom.12596]

Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-3991568
E-mail: office@baishideng.com
Help Desk: https://www.f6publishing.com/helpdesk
https://www.wjgnet.com