INPLASY

The Impact of Glucagon-Like Peptide-1 Receptor Agonists on the Quality Indicators of Colonoscopy – Systematic Review and Meta-analysis

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Piloting of the study selection process.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 15 January 2025 and was last updated on 15 January 2025.

INTRODUCTION

*R*eview question / Objective The PICO (population, intervention/comparison, outcome) setting of this study was as the followings: P – patients receiving colonoscopy; I – Glucagon-like peptide-1 receptor agonist (GLP-1 RA) users; C – controls; and O – colonoscopy quality indicators (the rate of inadequate bowel preparation / total BBPS scores / ADR / the rate of early repeat colonoscopy).

Rationale GLP-1 RAs are an emerging but established treatment option for metabolic disorders, with clinical use spanning over the past several years. Aside from the glucose-lowering effect, it also reduces body weight, blood pressure, and inflammation, contributing to the reduction of cardiovascular events. Certain types of GLP-1 RAs have demonstrated excellent weight reduction effects and have even received indications for obesity treatment beyond the context of diabetes.

GLP-1 RA exerts its glucose-lowering effect through various mechanisms, including the stimulation of insulin release, inhibiting post-meal glucagon release, slowing gastric emptying, and hence reducing food intake. However, the GI motility-inhibiting effects have raised concerns, including a potentially increased risk of aspiration during surgery or upper gastrointestinal endoscopy, as well as its impact on bowel preparation quality. The first analysis examining the association between GLP-1 RA use and inadequate bowel preparation was published in 2017, reporting no significant difference between GLP-1 RA users and controls. Nevertheless, subsequent trials on the same subject showed conflicting results. Diabetes mellitus is associated with a greater need for colonoscopy owing to the increased risk of colorectal cancer, and adequate bowel preparation improves the detection of colorectal lesions and is essential for successful colonoscopy screening. Therefore, determining whether GLP-1 RA affects bowel preparation

quality is of significant clinical relevance. We aim to address this issue through a systematic review and meta-analysis, examining the relationship between GLP-1 RA use and colonoscopy quality indicators, including the rate of inadequate bowel preparation, total BBPS scores, adenoma detection rate (ADR), and the rate of early repeat colonoscopy.

Condition being studied The study focuses on the quality indicators for colonoscopy in patients using glucagon-like peptide-1 receptor agonists (GLP-1 RAs). GLP-1 RAs are widely used for managing type 2 diabetes and obesity but may affect gastrointestinal motility, potentially impacting the colonoscopy quality indicators.

METHODS

Search strategy We use the following key words as search conditions in Pubmed and Embase: ((Glucagon-Like Peptide-1 Receptor agonist) OR (GLP-1 receptor agonist) OR (GLP-1 analog)) AND ((bowel (preparation OR cleansing)) OR (adenoma detection)).

Participant or population This study aims to investigate patients receiving colonoscopy, with or without the use of GLP-1 RA.

Intervention The intervention group will be those using GLP-1 RA before the colonoscopy.

Comparator The control group will be those NOT using GLP-1 RA before the colonoscopy.

Study designs to be included The study design could be either randomized controlled trials (RCTs) or prospective / retrospective cohort studies.

Eligibility criteria The inclusion criteria consisted of clinical trials involving human subjects undergoing colonoscopy, with an intervention group of GLP-1 RA users and a control group, and reporting at least one of the colonoscopy quality indicators mentioned above. The exclusion criteria were: 1) non-English literature; 2) studies that did not report any of the colonoscopy quality indicators; and 3) meeting abstracts, conference proceedings, or unpublished data. Disagreements on the eligible criteria between the two reviewers will be resolved by discussion till there's a consensus.

Information sources Pubmed and Embase.

Main outcome(s) The main outcomes are the colonoscopy quality indicators which include:
– The rate of inadequate bowel preparation

– Total BBPS scores
– Adenoma detection rate (ADR)
– The rate of early repeat colonoscopy.

Quality assessment / Risk of bias analysis The Cochrane Risk of Bias (RoB 1) tool was used for quality appraisal of randomized controlled trials (RCTs), while the Newcastle-Ottawa Scale (NOS) was used for cohort studies.

Strategy of data synthesis RevMan ver 5.4 was used for statistical analysis. Because of the potential heterogeneity among the enrolled studies, the meta-analysis was conducted using the inverse variance method with a random-effects model (DerSimonian Laird method). Risk difference was used as the effect measure for dichotomous data, while mean difference was used for continuous data. Heterogeneity between studies was assessed using the I-square statistic; I-square values of 25, 50, and 75% were considered low, moderate, and high heterogeneity, respectively. Potential publication bias was evaluated using funnel plot and Egger's regression test. Trial Sequential Analysis (TSA) was performed using the TSA software package (available at http://www.ctu.dk/tsa/) to estimate the required sample size for the meta-analysis.

Subgroup analysis Subgroup analysis may be performed for specific types of GLP-1 RAs if feasible.

Sensitivity analysis To ensure the reliability of this meta-analysis, sensitivity analyses were conducted by systematically removing one study at a time. This approach was used to check if the exclusion of any single study significantly altered the overall effect size.

Language restriction Non-English literature will be excluded.

Country(ies) involved Taiwan.

Keywords Glucagon-like peptide-1 receptor agonist, Bowel preparation, Adenoma detection rate, Colonoscopy.

Dissemination plans Publishing results in peer-reviewed journals.

Contributions of each author
Author 1 - Yu-tse Chiu - Author 1 contributed to the conceptualization and design of the study, developed the methodology, and oversaw project administration. Author 1 also performed the data extraction and drafted the manuscript.

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Author 2 - Yu-tsung Chen - Author 2 assisted with electronic searches, reviewed the extracted data for accuracy, and contributed to the manuscript drafting and revision.
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