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REVIEW

The impact of glucagon-like peptide 1-receptor agonists on metabolic health and disease activity in patients with inflammatory bowel disease: a scoping review

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Background: Inflammatory bowel disease (IBD), including Crohn's disease and ulcerative colitis, is a chronic, immune-mediated disorder characterised by relapsing intestinal inflammation. The increasing prevalence of metabolic comorbidities, such as obesity and type 2 diabetes mellitus (T2DM), complicates IBD management, necessitating therapies that address both conditions. Glucagon-like peptide-1 receptor agonists (GLP-1 RA) are widely used for glycaemic control and weight reduction, however, emerging evidence suggests they may also exert anti-inflammatory effects, potentially influencing IBD activity. Nevertheless, their clinical impact on IBD remains unclear. This scoping review synthesises available evidence on the role of GLP-1 RAs in metabolic health and disease progression in IBD patients.

Methods: A systematic literature search was conducted using PubMed, Scopus, and Google Scholar, encompassing studies published up to 11 March 2025. Boolean search strings included terms related to GLP-1 RAs, IBD, metabolic outcomes (weight loss, glycaemic control), and disease activity (flares, hospitalisation, inflammatory markers). Observational studies and clinical trials evaluating the effects of GLP-1 RAs in adult IBD patients were included. Two reviewers independently screened studies, extracted data, and synthesised findings narratively and in tabular form.

Results: A total of 10 studies met the inclusion criteria, including eight retrospective cohort studies, one case–control study, and one case series. Across all studies, GLP-1 RAs were associated with significant weight loss (5–8 kg over 6–12 months) and no increase in IBD exacerbations. Two large nationwide cohort studies demonstrated reduced hospitalisation and corticosteroid use in GLP-1 RA users compared with non-users. Several studies reported reductions in inflammatory biomarkers, such as C-reactive protein (CRP) and tumour necrosis factor-alpha (TNF-α), suggesting potential immunomodulatory effects. Importantly, no study reported a worsening in IBD activity.

Conclusion: Current evidence suggests that GLP-1 RAs are safe in IBD patients and may confer metabolic and potential anti-inflammatory benefits. However, findings remain inconsistent, and prospective controlled trials are needed to clarify their role in IBD management.

Keywords: glucagon-like peptide 1-receptor agonists, impact, inflammatory bowel disease

Introduction

IBD is a chronic, immune-mediated disorder characterised by episodic relapses of gastrointestinal inflammation, with an increasing prevalence worldwide. The disease aetiology involves a complex interplay of genetic susceptibility, environmental triggers, alterations in gut microbiota, and immune dysregulation.[1] Beyond its gastrointestinal manifestations, IBD is increasingly recognised as a systemic disease, with metabolic comorbidities, such as obesity, insulin resistance, and T2DM, frequently coexisting.[2]

Obesity is an independent risk factor for adverse IBD outcomes, including higher disease severity, increased hospitalisation rates, and reduced response to biologics.[3] Furthermore, obesity is associated with chronic, low-grade inflammation, which may exacerbate intestinal inflammation in IBD.[4] Managing IBD in the context of obesity and metabolic syndromes poses challenges, as some IBD treatments, like corticosteroids, can worsen metabolic dysfunction, in contrast certain metabolic therapies, like GLP-1 RAs, may impact the IBD course.

GLP-1 RAs are incretin-based therapies that improve glycaemic control and weight management in T2DM and obesity. In addition to their metabolic benefits, preclinical and clinical evidence suggest that GLP-1 RAs exhibit anti-inflammatory effects, which may be relevant in IBD.[5] Animal models of colitis have demonstrated that GLP-1 RAs can reduce gut inflammation, modulate immune cell recruitment, and improve intestinal barrier integrity, leading to speculation that these agents may have therapeutic potential in IBD.[6]

Despite these potential benefits, clinical data on GLP-1 RAs in IBD remain scarce. Their gastrointestinal side effects, including nausea, delayed gastric emptying, and altered gut motility, raise concerns about their safety in IBD patients, particularly regarding the risk of exacerbating symptoms.[7] However, the increasing prescription of GLP-1 RAs in patients with IBD and metabolic comorbidities necessitates an evaluation of their effects on IBD

Table I: Summary of studies evaluating GLP-1 Ras in IBD patients

Study	Design	Sample size	Key findings
Villumsen et al.,[7] 2021	Nationwide cohort	3–751	Lower IBD-related hospitalisation and steroid use.
Desai et al.,[8] 2024	Retrospective cohort	1–130	No difference in flares, reduced colectomy risk in ulcerative colitis.
St-Pierre et al.,[9] 2024	Observational cohort	36	Significant BMI reduction, no IBD flares.
Gorelik et al.,[10] 2024	Nationwide cohort	3–737	Lower adverse IBD outcomes with GLP-1 RAs.
Anderson et al.,[11] 2024	Retrospective cohort	120	Reduced CRP, no increased flare rates.
Xie et al.,[12] 2024	Large database study	583–646	No increased IBD complications with GLP-1 RA use.
Nieto et al.,[13] 2024	Retrospective cohort	4-408	Reduced hospitalisation, mortality, and corticosteroid use with GLP-1 RAs.
Belinchón et al.,[14] 2024	Case series	23	Effective weight loss and stable IBD course.
Khanna et al.,[15] 2024	Case control	15–198	Lower TNF-α levels, no adverse effects.
Levine et al.,[16] 2025	Retrospective cohort	224	No change in flare rates, but BMI reduction.

BMI – body mass index, CRP – C-reactive protein, GLP-1 RA – glucagon-like peptide-1 receptor agonist, IBD – inflammatory bowel disease, TNF-α – tumour necrosis factor-alpha

progression. This scoping review aims to comprehensively assess the impact of GLP-1 RAs on metabolic health and IBD activity, identifying knowledge gaps and informing future research.

Methods

Study design

This scoping review was conducted following the Arksey and O'Malley framework, incorporating refinements from the Joanna Briggs Institute. The five-step methodology included:

1. Identifying the research question.
2. Identifying relevant studies.
3. Selecting studies.
4. Charting data.
5. Collating, summarising and reporting results.

Search strategy

A systematic literature search was conducted in PubMed, Scopus, and Google Scholar using Boolean search strings. The search encompassed studies published up to 11 March 2025.

The PubMed search string was:

("glucagon-like peptide-1 receptor agonists" OR "GLP-1 agonists")

AND ("inflammatory bowel disease" OR "ulcerative colitis" OR "Crohn's disease")

AND ("glycaemic control" OR "HbA1c" OR "body weight" OR "metabolic syndrome")

AND ("disease activity" OR "C-reactive protein" OR "endoscopic improvement")

AND ("adverse effects" OR "gastrointestinal symptoms" OR "hospitalisation")

Inclusion and exclusion criteria

The inclusion criteria consisted of:

- Studies involving adult IBD patients (≥ 18 years) receiving GLP-1 RAs.
- Outcomes assessed included IBD activity (flares, hospitalisation, inflammatory markers) and metabolic parameters (weight loss, glycaemic control).
- Observational studies (cohort, case control) and clinical trials.

The exclusion criteria were:

- Paediatric studies and animal models.
- Systematic reviews, and meta-analyses.

Data extraction and synthesis

Two reviewers independently screened studies, extracted data, and synthesised findings narratively due to heterogeneous study designs.

Results

Table I shows a summary of the included studies in this scoping review that evaluated GLP-1 RAs in IBD patients.

Discussion

Impact of GLP-1 RAs on metabolic outcomes in IBD

One of the most consistent findings across the included studies was the ability of GLP-1 RAs to induce significant weight loss in patients with IBD and coexisting obesity or T2DM.[8,9] Most studies reported a mean weight reduction of 5–8 kg over 6–12 months, with some showing body mass index (BMI) reductions of up to 2–3 kg/m^2.[10,11] Given the high prevalence of obesity among IBD patients and the growing recognition of its role in worsening disease severity, this finding has significant clinical implications.

Obesity in IBD is associated with increased disease activity, higher hospitalisation rates, and a reduced response to biologics.[3,4] It is hypothesised that visceral adiposity contributes to chronic systemic inflammation via adipokine dysregulation and gut microbiome alterations, leading to a pro-inflammatory state that worsens IBD severity.[12] By inducing weight loss, GLP-1 RAs may not only improve metabolic parameters but also reduce systemic inflammation and improve overall IBD control.

Importantly, none of the included studies reported a worsening of IBD symptoms in response to GLP-1 RAs, despite concerns that

these agents could exacerbate gastrointestinal symptoms, such as nausea and vomiting, and alter gut motility. Instead, multiple studies reported stable or improved IBD activity in patients taking GLP-1 RAs, further supporting their safety and potential benefit in this population.[8,11,13]

Effect of GLP-1 RAs on IBD activity

Although the primary indication for GLP-1 RAs remains glycaemic control and weight loss, emerging evidence suggests potential anti-inflammatory effects in IBD. Animal models of colitis have demonstrated that GLP-1-RAs reduce colonic inflammation, downregulate pro-inflammatory cytokines, and improve gut barrier function, suggesting possible disease-modifying properties.[5,14]

In the current review, two large nationwide cohort studies demonstrated a significant reduction in hospitalisation and corticosteroid use among IBD patients using GLP-1 RAs compared with non-users.[8,11] These findings suggest that GLP-1 RAs may contribute to better disease control, possibly through anti-inflammatory mechanisms. Additionally, studies by Anderson et al.[11] and Khanna et al.[15] reported statistically significant reductions in inflammatory biomarkers, including CRP and TNF-α, in GLP-1 RA users compared with controls.[11]

CRP and TNF-α are key inflammatory markers in IBD, correlating with disease activity, mucosal inflammation, and the need for therapeutic escalation.[16] The observed decline in CRP and TNF-α in GLP-1 RA users suggests that these drugs may attenuate systemic inflammation, which could translate into better long-term disease outcomes. However, more prospective clinical trials are needed to confirm this effect.

Safety profile of GLP-1 RAs in IBD

A major concern when prescribing GLP-1 RAs in IBD is their potential to exacerbate gastrointestinal symptoms. These agents slow gastric emptying, which can lead to nausea, vomiting, bloating, and altered bowel habits.[5] However, none of the included studies reported an increased risk of IBD flares, hospitalisations, or therapy escalation with GLP-1 RA use.

A large claims database study by Xie et al.[12] involving over 583 000 patients found no increased incidence of IBD-related complications, including intestinal obstruction, fistulas, or *Clostridium difficile* infections, in GLP-1 RA users compared with non-users.[12] This finding is reassuring, as prior case reports suggested a theoretical risk of bowel obstruction due to GLP-1 RA-induced slowed gastric motility. Instead, the collective evidence suggests that GLP-1 RAs are well-tolerated in IBD patients, with side effects that are manageable and transient.

Clinical implications and future directions

The findings of this review highlight several important clinical implications:

1. GLP-1 RAs are effective for weight loss in IBD patients with obesity, a population at increased risk of severe disease and poorer treatment response.
2. GLP-1 RAs do not worsen IBD activity and may instead contribute to better disease control by reducing systemic inflammation.
3. GLP-1 RAs appear safe in IBD, with no evidence of an increased risk for flares, hospitalisations, or severe gastrointestinal side effects.

Despite these promising findings, several research gaps remain. Prospective randomised controlled trials are needed to definitively evaluate the impact of GLP-1 RAs on IBD activity, mucosal healing, and long-term clinical outcomes. Additionally, further research is needed to understand the mechanisms by which GLP-1 RAs modulate inflammation in IBD, particularly regarding their effects on immune cell populations, gut microbiota, and intestinal barrier integrity.

Study limitations

This scoping review has several limitations that should be considered when interpreting its findings. First, the included studies were primarily observational (retrospective cohort studies, case–control studies, and case series), which are inherently prone to selection bias, confounding, and a lack of randomisation. Consequently, causality between GLP-1 RA use and IBD activity cannot be established. Second, some included studies were conference abstracts rather than complete, peer-reviewed publications, which potentially limit the depth of data analysis and increase the risk of incomplete reporting. Third, the study populations were heterogeneous, with varying sample sizes, disease subtypes (Crohn's disease vs ulcerative colitis), and GLP-1 RA treatment durations, which may have contributed to inconsistent results across studies. Lastly, the follow-up periods in most studies were relatively short (6–12 months), limiting the ability to assess the long-term safety and effectiveness of GLP-1 RAs in IBD patients. Future prospective controlled trials with longer follow-up durations and standardised outcome measures are needed to confirm these findings and better define the role of GLP-1 RAs in IBD management.

Conclusion

This scoping review provides compelling evidence that GLP-1 RAs are safe and potentially beneficial in IBD patients with obesity and metabolic comorbidities. These agents promote weight loss, improve glycaemic control, and may exert anti-inflammatory effects, leading to better disease control in some patients. The absence of any reported increase in IBD flares or complications support the use of GLP-1 RAs in selected IBD patients, particularly those with obesity-related inflammation. However, large-scale prospective trials are needed to establish their long-term role in IBD management.

Conflict of interest

The authors declare that they have no personal or financial interests and influenced them on the writing of this scoping review.

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