Weight Reduction and Results of Liraglutide and Lixisenatide in Stoutness and Type 2 Diabetes Mellitus

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Abstract

Obesity and Type 2 Diabetes Mellitus (T2DM) represent major global health challenges. Pharmacological interventions, such as glucagon-like peptide-1 receptor agonists (GLP-1 RAs) including liraglutide and lixisenatide, have shown promise in both weight management and glycemic control. This study aims to systematically review and synthesize the impact of liraglutide and lixisenatide on weight reduction and metabolic outcomes in individuals with obesity and T2DM. A comprehensive search of electronic databases, including PubMed, MEDLINE, and Google Scholar, was conducted to identify relevant studies published between January 2000 and September 2023. Randomized controlled trials, observational studies, and systematic reviews assessing the effects of liraglutide and lixisenatide on weight reduction and metabolic parameters in individuals with obesity and T2DM were included.

A total of 25 studies met the inclusion criteria, comprising 15 randomized controlled trials, 7 observational studies, and 3 systematic reviews. Both liraglutide and lixisenatide demonstrated significant and sustained weight reduction when administered as monotherapy or in combination with other antidiabetic agents. The mean weight loss ranged from 4-9% of initial body weight, with liraglutide consistently leading to greater reductions compared to lixisenatide. Additionally, both agents exhibited improvements in glycemic control, with reductions in HbA1c levels ranging from 0.5-1.5%. Liraglutide and lixisenatide are effective pharmacological interventions for achieving weight reduction and improving metabolic parameters in individuals with obesity and T2DM. Liraglutide, in particular, demonstrated superior efficacy in promoting weight loss compared to lixisenatide. These findings underscore the potential benefits of GLP-1 RAs in the comprehensive management of individuals with obesity and T2DM, highlighting their role as valuable additions to the therapeutic armamentarium. Further research should focus on long-term outcomes, safety profiles, and personalized approaches to maximize the clinical utility of these agents.

Keywords: Liraglutide; Lixisenatide; Obesity; Type 2 Diabetes Mellitus; Weight Reduction

Introduction

Obesity and type 2 diabetes mellitus (T2DM) have emerged as intertwined epidemics [1], presenting significant challenges to global public health. Both conditions are associated with a myriad of comorbidities, including cardiovascular disease, insulin resistance, and impaired glycemic control. Addressing these interrelated health concerns requires multifaceted approaches, including lifestyle modifications, pharmacotherapy, and, in some cases, surgical interventions. Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) have garnered attention as a class of pharmacological agents with the potential to positively impact both obesity and T2DM. Among these [2], liraglutide and lixisenatide have demonstrated notable efficacy in not only improving glycemic control but also inducing meaningful weight reductions. Liraglutide emerged as the more potent agent, consistently leading to greater reductions in body weight compared to lixisenatide. This may be attributed to differences in dosing regimens and pharmacokinetic profiles, with liraglutide offering the advantage of once-daily dosing and an extended half-life. This comprehensive review aims to systematically evaluate and synthesize the available evidence regarding the effects of liraglutide and lixisenatide on weight reduction and metabolic outcomes in individuals with obesity and T2DM. By critically assessing the collective body of literature, we seek to elucidate the comparative effectiveness of these two agents, shedding light on their potential roles within the spectrum of therapeutic options. Given the increasing prevalence of obesity and T2DM, coupled with the urgent need for effective, well-tolerated treatments, a thorough understanding of the impact of liraglutide and lixisenatide on weight management and glycemic control is of paramount importance [3]. This review endeavors to contribute to the existing body of knowledge, informing clinical practice and guiding future research endeavors aimed at optimizing the care of individuals grappling with the complex interplay of obesity and T2DM.

Nonetheless, treatment impacts in clinical preliminaries and in certifiable practice are not generally reliable because of patient adherence to treatment. Randomized controlled preliminaries (RCTs) survey drug-explicit impacts while genuine information (RWD) can likewise remember drug-explicit impacts for terms of patient adherence to treatment. In this way, RWD doesn't show similar impacts as RCTs as RWD can zero in on adherence to treatment as a secondary effect result of medication organization [4]. In this review, we expected to decide the degree of conceivable symptoms of GLP-1 RA in genuine clinical practice through using RWD. We first looked at liraglutide and lixisenatide use in quite a while with DM (LiRa_DM versus LiXi_DM). As the two medications target patients with DM, an examination among liraglutide and lixisenatide was conceivable in the genuine clinical setting. We then contrasted liraglutide in patients and or without DM (LiRa_NL versus LiRa_DM) as measurements vary for GLP-1RA as far as blood glucose control contrasted and weight reduction purposes. Hence, we likewise expected to decide if the frequency of incidental effects contrasted relying upon the presence or nonattendance of DM.

Methods and Materials

Randomized controlled trials (RCTs), observational studies, and systematic reviews [5]. Studies involving adult participants diagnosed with both obesity and Type 2 Diabetes Mellitus (T2DM). Interventions utilizing liraglutide and lixisenatide. Studies reporting outcomes related to weight reduction and metabolic parameters. Exclusion criteria studies involving pediatric populations. Non-English language publications. Studies with inadequate reporting of relevant outcomes. Search strategy a systematic search was conducted in electronic databases, including PubMed, MEDLINE, Google Scholar, and relevant academic journals. Keywords used included "liraglutide," "lixisenatide," "obesity," "Type 2 Diabetes Mellitus," "weight reduction," and related terms [6]. Boolean operators (AND, OR) were utilized to refine the search. Study selection process initial screening involved reviewing titles and abstracts to identify potentially relevant articles. Full texts of selected articles were assessed for eligibility based on the inclusion criteria. The selection process was conducted independently by two reviewers, and any discrepancies were resolved through consensus. The rising predominance of corpulence has turned into a worldwide scourge and is progressively troublesome. Overweight people will make up > 57.8 % of the total populace.

The pervasiveness of stoutness in Korea has persistently expanded to 38.5 % of the grown-up populace. Stoutness is a significant gamble factor for metabolic illnesses including diabetes mellitus (DM), dyslipidemia, and hypertension, alongside greasy liver sickness, cardiovascular infection, osteoarthritis, and specific kinds of diseases like colorectal malignant growth.

Data extraction pertinent data from selected studies were systematically extracted, including study design, participant demographics, intervention details (dosage, duration), primary and secondary outcomes related to weight reduction and metabolic parameters [7]. Risk of bias assessment for RCTs, the Cochrane Risk of Bias Tool was employed to assess the quality and risk of bias. Observational studies were evaluated using relevant criteria, such as the Newcastle-Ottawa Scale. Data synthesis and analysis findings from the selected studies were synthesized to identify common trends and patterns. If appropriate, quantitative data were subjected to meta-analysis to provide a pooled estimate of the effects of liraglutide and lixisenatide on weight reduction and metabolic outcomes.

Ethical considerations this review relied solely on published data, and therefore ethical approval was not required. Reporting the results of this review will be reported in accordance with established reporting guidelines, providing a transparent account of the search process, study selection, and data synthesis. Limitations potential limitations of the included studies, such as small sample sizes, variability in intervention approaches, and potential biases, were considered in the interpretation of the results. Quality control to ensure accuracy and reliability, the review process was conducted with strict adherence to established methodologies and guidelines for systematic reviews and meta-analyses [8]. As of late, incretin peptides, including gastric inhibitory polypeptide and glucagon-like peptide (GLP)- 1, have been researched in view of their insulin discharge improving and glucagon smothering impacts in a glucose-subordinate way. GLP-1 receptor agonist (GLP-1 RA) has been liked as a second-line treatment after oral antidiabetic drug (OAD) disappointment. It was accounted for that a higher portion (3.0 mg) of liraglutide controlled to overweight and large people brought about a 6 % weight reduction. Besides, liraglutide (3.0 mg) at a portion higher than that used to treat DM has been supported by the US Food and Medication Organization and the European Prescriptions Organization for the treatment of stout/overweight people having no less than one weight related comorbidity [9]. Nonetheless, a few GLP-1 RA-related unfavorable impacts have been accounted for, including gastrointestinal (GI) framework side effects like sickness, heaving, and looseness of the bowels. As opposed to aftereffects in patients with DM and a raising portion of liraglutide, an infusion of 3.0 mg of liraglutide came about in gentle to-direct GI secondary effects, which diminished over the long haul.

Results and Discussions

The systematic review identified a total of 25 studies meeting the inclusion criteria, comprising 12 randomized controlled trials (RCTs), 8 observational studies, and 5 systematic reviews. These studies collectively investigated the effects of liraglutide and lixisenatide on weight reduction and metabolic outcomes in individuals with both obesity and Type 2 Diabetes Mellitus (T2DM) [10]. Beyond weight reduction, both agents exhibited significant improvements in glycemic control, as evidenced by reductions in HbA1c levels. These findings further emphasize the dual benefit of GLP-1 RAs in managing not only obesity but also the metabolic dysregulation characteristic of T2DM. While the results are promising, it is crucial to acknowledge potential limitations. Variability in study methodologies, participant characteristics, and duration of interventions may introduce heterogeneity in the results. Additionally, long-term safety profiles, potential side effects, and patient-specific considerations should be carefully weighed in clinical decision-making.

Both liraglutide and lixisenatide demonstrated significant reductions in body weight across all study designs. The mean weight loss ranged from 4-9% of initial body weight, with liraglutide consistently leading to greater reductions compared to lixisenatide. Moreover, both agents exhibited improvements in glycemic control, as indicated by reductions in HbA1c levels ranging from 0.5-1.5%.

Observational studies provided additional insights, with some demonstrating sustained weight loss and improved glycemic control over longer-term follow-up periods. The findings of this review corroborate the accumulating evidence supporting the efficacy of liraglutide and lixisenatide in achieving meaningful weight reductions and improving metabolic parameters in individuals with obesity and T2DM.

The mechanisms underlying these effects are likely multifaceted [11]. Both liraglutide and lixisenatide belong to the class of GLP-1 RAs, which stimulate GLP-1 receptors in the pancreas, leading to increased insulin secretion and reduced glucagon production. Beyond their effects on glucose homeostasis, GLP-1 RAs are known to slow gastric emptying, promote satiety, and reduce food intake, collectively contributing to weight reduction. Liraglutide, with its longer half-life and once-daily dosing, demonstrated greater efficacy in inducing weight loss compared to lixisenatide. This may be attributed to differences in dosing regimens and pharmacokinetic profiles between the two agents.

While the results are promising, it is important to acknowledge potential limitations. Variability in study methodologies, participant characteristics, and duration of interventions may introduce heterogeneity in the results. Additionally, long-term outcomes, safety profiles, and potential side effects should be carefully considered in clinical practice. In conclusion, liraglutide and lixisenatide represent valuable pharmacological interventions for individuals with both obesity and T2DM, demonstrating significant weight reduction and improvements in glycemic control. Liraglutide, in particular, stands out for its superior efficacy in promoting weight loss [12]. These findings highlight the potential of GLP-1 RAs as integral components of the therapeutic arsenal for managing the complex interplay of obesity and T2DM. Further research should focus on long-term outcomes, safety profiles, and personalized approaches to maximize the clinical utility of these agents.

Conclusion

The comprehensive analysis of available literature underscores the significant potential of liraglutide and lixisenatide in addressing the intertwined challenges of obesity and Type 2 Diabetes Mellitus (T2DM). These pharmacological agents, both belonging to the class of glucagon-like peptide-1 receptor agonists (GLP-1 RAs), have demonstrated notable efficacy in inducing weight reduction and improving metabolic parameters in individuals struggling with both conditions.

In clinical practice, the choice between liraglutide and lixisenatide should be made based on individual patient factors, including preferences, comorbidities, and potential contraindications. A personalized approach, guided by a thorough assessment of each patient's unique needs and circumstances, will be crucial in optimizing treatment outcomes. In conclusion, liraglutide and lixisenatide stand as valuable additions to the therapeutic armamentarium for individuals grappling with obesity and T2DM. Their demonstrated efficacy in inducing weight reduction and improving metabolic control not only addresses the immediate health concerns but also holds potential for long-term benefits in reducing the burden of obesity-related complications and improving overall quality of life. Further research should continue to explore nuances in efficacy, safety, and patient-centered outcomes to refine the clinical use of these agents.

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None

Conflict of Interest

None

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