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PERSPECTIVES AND CHALLENGES IN THE USE OF OZEMPIC AND MOUNJARO IN PATIENTS WITH METABOLIC DISEASES: AN UPDATED REVIEW

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Abstract: This article presents a comprehensive review of the use of GLP-1 receptor agonists, such as Ozempic (semaglutide), and dual GLP-1/GIP receptor agonists, such as Mounjaro (tirzepatide), in the treatment of metabolic diseases, with a primary focus on type 2 diabetes and obesity. The analysis details the mechanisms of action of these drugs, which mimic the action of the GLP-1 hormone, resulting in an effective reduction in blood glucose levels and promoting weight loss. GLP-1 agonists, such as Ozempic, work by stimulating insulin secretion and inhibiting the release of glucagon, which is crucial for glycemic control in patients with type 2 diabetes. In addition, these drugs have been shown to be effective in reducing appetite and promoting satiety, factors that contribute significantly to weight loss. Mounjaro, on the other hand, combines the action of GLP-1 with that of GIP, further enhancing these effects and offering a promising alternative for patients who do not respond adequately to other treatments. The review also looks at recent data from clinical trials and meta-analyses proving the therapeutic efficacy of these drugs. The results indicate that both Ozempic and Mounjaro are capable of providing significant reductions in HbA1c levels and body weight, as well as improving important metabolic parameters. However, despite the promising short-term results, long-term use of these drugs raises concerns about possible adverse effects, such as pancreatitis and gallbladder problems. Adherence to treatment can be challenging due to common gastrointestinal side effects, such as nausea and vomiting, which often occur at the start of therapy. Therefore, close medical follow-up is essential to monitor the response to treatment and adjust doses as necessary. In addition, personalizing treatment is highlighted as a crucial factor in maximizing the benefits of GLP-1 and GIP agonists. Considering aspects such as genetic predisposition, clinical history

and comorbidities can help optimize results and minimize risks associated with prolonged use of these therapies. Finally, future research should focus not only on comparing different drug combinations, but also on analyzing the long-term effects of these therapies. Although GLP-1 and GIP agonists represent a significant advance in the clinical management of metabolic diseases, issues related to long-term safety still need to be addressed to ensure that these treatments are used as effectively and safely as possible.

Keywords: Ozempic, Mounjaro, metabolic diseases, type 2 diabetes, obesity, GLP-1 agonists, GIP agonists.

INTRODUCTION

Metabolic diseases, particularly type 2 diabetes mellitus and obesity, have become major public health problems in recent decades. The increase in the prevalence of these conditions is associated with changes in lifestyle, inadequate eating habits and an increase in sedentary lifestyles. The clinical management of patients with these diseases involves the use of drugs to help control blood glucose and lose weight. Innovative drugs for these conditions include glucagon-like peptide-1 (GLP-1) receptor agonists, such as Ozempic, and dual GLP-1/GIP receptor agonists, such as Mounjaro. These therapies have shown considerable benefits in terms of glycemic management and weight reduction, fundamental aspects in controlling type 2 diabetes and obesity.

However, although studies indicate that these drugs can bring major advances, challenges arise related to treatment adherence, adverse effects and long-term efficacy. This paper therefore sets out to carry out a review of recent literature with the aim of discussing the prospects and challenges of using Ozempic and Mounjaro in patients with metabolic diseases, providing an up-to-date overview of their potential and limitations.

METHODOLOGY

The methodology adopted for this review was based on the careful selection of scientific articles and systematic reviews published between 2015 and 2023 in the main medical databases, such as PubMed, Scielo and Google Scholar. The keywords used for the search were "Ozempic", "Mounjaro", "metabolic diseases", "type 2 diabetes", "obesity", "GLP-1" and "GIP". Clinical studies, systematic reviews and randomized controlled trials discussing the efficacy, safety and adverse effects of the use of these drugs in adult patients were included.

Excluded from the review were studies carried out in pediatric populations, studies that did not present concrete data on safety and efficacy, or studies without peer review. The main inclusion criterion was the presentation of results on glycemic control (measured by reductions in HbA1c), weight loss, side effects and adherence to treatment. The critical analysis of the studies was descriptive and comparative, highlighting the main findings.

MECHANISM OF ACTION OF OZEMPIC AND MOUNJARO

OZEMPIC (SEMAGLUTIDE)

Ozempic is a GLP-1 receptor agonist, whose action is mediated by the stimulation of insulin secretion in response to food intake, particularly in states of hyperglycemia. This drug also reduces the secretion of glucagon, the hormone responsible for increasing blood glucose, and delays gastric emptying, contributing to the feeling of satiety and, consequently, weight loss (EM. COM.BR, 2023). Studies have shown that Ozempic can significantly reduce glycated hemoglobin (HbA1c) levels and promote a weight reduction of 5% to 15%, depending on the dose used and the patient's profile (DREDUARDOENDOCRINO, 2023).

MOUNJARO (TIRZEPATIDA)

Mounjaro is a dual agonist that acts on both GLP-1 and GIP (gastric inhibitory peptide) receptors. By activating both receptors, it potentiates insulin secretion, improves glycemic control and promotes greater weight loss than drugs that act only on the GLP-1 receptor (EM.COM.BR, 2023). Data from clinical trials indicate that patients treated with Mounjaro show significant reductions in HbA1c and weight loss greater than that seen with other drugs in the same class, such as Ozempic (O GLOBO, 2023).

THERAPEUTIC BENEFITS: GLYCEMIC CONTROL

Randomized clinical trials have shown that both Ozempic and Mounjaro are effective in glycemic control in patients with type 2 diabetes, with significant reductions in HbA1c levels. The use of these drugs is particularly beneficial for patients who are unable to achieve adequate glycemic control with conventional treatments such as metformin and insulin (CNN BRAZIL, 2023). Comparatively, Mounjaro has shown superior efficacy in some studies, with greater blood glucose reduction and better long-term control (PILL.COM.BR, 2023).

WEIGHT LOSS

In addition to glycemic control, one of the most prominent benefits of these drugs is their ability to promote weight loss, an essential factor in the control of metabolic diseases Clinical trials have shown that patients treated with Ozempic and Mounjaro experienced significant reductions in body weight, which can contribute to overall health improvement and cardiovascular risk reduction (G1, 2023). Mounjaro, with its dual action, seems to offer an even more pronounced effect on weight loss (JAMA Internal Medicine, 2023).

CHALLENGES AND ADVERSE EFFECTS: GASTROINTESTINAL EFFECTS

The most common adverse effects associated with the use of Ozempic and Mounjaro are gastrointestinal, including nausea, vomiting and diarrhea. These symptoms usually occur at the beginning of treatment and tend to subside over time as the body adapts to the drug (Frias et al., 2021). However, these effects can limit adherence to treatment in some patients, especially those who are more sensitive to changes in the gastrointestinal tract (Jastreboff et al., 2022).

LONG-TERM USE AND SAFETY

Although the short-term results are promising, long-term use of these drugs still raises concerns (Davies et al., 2021). Observational studies suggest that long-term use may be associated with increased risks of pancreatitis, gallbladder disease and possibly thyroid cancer, although the evidence is still inconclusive. Therefore, close monitoring is essential, and more long-term studies are needed to confirm the safety of these therapies. Research indicates that long-term use of Mounjaro and Ozempic may raise concerns about increased risks of thyroid cancer, requiring further studies to elucidate the long-term safety of these therapies (Jastreboff et al., 2022).

FUTURE PROSPECTS

The future of GLP-1 and GIP agonist treatments looks promising, especially as new drugs are being developed with the aim of further improving efficacy and reducing adverse effects, with an emphasis on comparing different drug combinations and analyzing the long-term effects of GLP-1 and GIP agonist therapies (Davies et al., 2022). Personalizing treatment, taking into account factors such as genetic predisposition, clinical history

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and comorbidities, will be key to maximizing the benefits of these drugs and minimizing the risks. Future research should also focus on comparing different drug combinations and analyzing the long-term effects of these therapies (Hernández et al., 2023).

CONCLUSION

The development of GLP-1 receptor agonists, such as Ozempic, and dual GLP-1/GIP agonists, such as Mounjaro, represents a significant advance in the treatment of metabolic diseases, particularly in the management of type 2 diabetes and obesity. These drugs provide remarkable improvements in glycemic control and weight loss, key factors in the treatment of these chronic conditions. The data reviewed indicate that both drugs are effective in reducing glycated hemoglobin (HbA1c) levels and body weight, as well as offering additional benefits in terms of reducing cardiovascular risks and improving patients' quality of life.

However, the introduction of these therapies in the clinical treatment of metabolic diseases is not without its challenges. One of the main obstacles to the widespread use of Ozempic and Mounjaro is related to adverse effects, especially those of a gastrointestinal nature, such as nausea, vomiting and diarrhea, which can impair adherence to treatment. Although most adverse symptoms tend to subside over time, these drugs require close clinical monitoring, especially in patients with a history of pancreatitis, gallbladder disease or a predisposition to cancer. Long-term safety is also an aspect that still needs to be better studied, as the available data is limited and does not allow definitive conclusions on the impact of their prolonged use.

Another important challenge involves individualizing treatment. Although GLP-1 and GIP agonists show efficacy in a wide range of patients, not everyone responds in the same way to therapies, and some may show resistance to the effects of weight loss or glycemic control. This reinforces the need for a personalized approach, in which treatment is adjusted to the patient's individual needs and characteristics, taking into account factors such as age, comorbidities, family history and genetic predispositions. The search for biomarkers that can predict response to treatment is a promising area for future research.

Furthermore, the comparison between Ozempic and Mounjaro points to a possible superiority of tirzepatide (Mounjaro), which, due to its dual mechanism of action (GLP-1/GIP), has shown more expressive results in glycemic control and weight loss in clinical trials. However, this therapeutic advantage needs to be balanced against the safety profile and individual tolerability, since adverse effects, mainly gastrointestinal, also tend to be more pronounced with Mounjaro.

In the context of health systems and public policies, the incorporation of these drugs into the clinical routine requires a careful cost-effectiveness analysis. Although highly effective, these treatments come at a high cost, which can limit their use on a large scale, especially in countries with public health systems or few resources. The economic viability of using GLP-1 and GIP agonists will largely depend on demonstrating their long-term impact in preventing diabetes complications, such as cardiovascular disease, kidney failure and amputations, which are extremely costly for health systems.

In short, Ozempic and Mounjaro represent a new therapeutic horizon for the treatment of metabolic diseases, offering more effective alternatives for controlling type 2 diabetes and obesity. However, their use requires a careful assessment of the risks and benefits, as well as continuous monitoring of patients to ensure treatment efficacy and minimize

side effects. The future of the management of these diseases, with the use of new therapies based on GLP-1 and GIP agonists, should focus on the personalization of treatment, long-term research into safety and efficacy, and the creation of health policies that ensure equitable access to these new technologies. Thus, the challenges and future prospects for these drugs are intertwined with the need for increasingly individualized and sustainable medicine.

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