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## The Rising Influence of Ozempic: From Aesthetic Trends to Post-Liver Transplant Obesity Management

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### ABSTRACT :

Ozempic (semaglutide) is making waves as a glucagon-like peptide 1 receptor agonist (GLP-1RA) known for its impressive weight loss and blood sugar control benefits. Initially created and approved by the FDA for treating type 2 diabetes mellitus (T2DM), semaglutide has recently caught the spotlight for off-label use in cosmetic weight loss, thanks in large part to social media buzz and celebrity endorsements. This shift in cultural perception has turned semaglutide into a go-to option for those seeking quick and easy weight loss solutions.

At the same time, there's a growing amount of clinical research focusing on semaglutide's role in managing obesity in more complex medical situations, like for patients who have undergone liver transplants (LTRs). These individuals often face weight gain due to immunosuppressive treatments and metabolic changes, making them ideal candidates for safe and effective weight loss medications.

This article delves into the two sides of semaglutide's rise, its media-driven allure and its developing clinical application in tackling post-transplant obesity, while shedding light on the scientific evidence, societal impacts, and ethical questions that come with its use.

### Introduction

Lately, we've seen how celebrity endorsements and social media trends have a huge impact on what people want and the medical choices they make. This is especially true in the world of plastic and cosmetic surgery, where the buzz around certain procedures often follows viral trends and the recommendations of influencers<sup>[1]-[4]</sup>. But it doesn't stop there; these societal pressures are also shaping how people use medications, particularly those related to weight loss and metabolic health. A prime example of this is Ozempic (semaglutide), which has skyrocketed in popularity thanks to celebrities, social media influencers, and the news media<sup>[5]-[9]</sup>.

Ozempic, produced by Novo Nordisk in Bagsværd, Denmark, is part of a group of medications known as glucagon-like peptide 1 (GLP-1) receptor agonists. These drugs mimic the natural GLP-1 hormone, which is essential for glucose metabolism by reducing glucagon secretion and increasing feelings of fullness. GLP-1 agonists, like semaglutide (marketed as Ozempic and Wegovy), tirzepatide (Mounjaro; Eli Lilly and Company), liraglutide, and exenatide, are mainly prescribed for managing type 2 diabetes mellitus (T2DM) and, in some cases, obesity. While Wegovy is specifically approved by the FDA for weight management in individuals with obesity, Ozempic is only FDA-approved for treating T2DM. However, the off-label use of Ozempic for cosmetic weight loss has surged, fueled by social media hype and celebrity endorsements, leading to shortages that affect patients who rely on these medications for diabetes management<sup>[10]-[13]</sup>.

In recent years, celebrity endorsements and social media trends have significantly influenced aesthetic demands and medical choices in society. This phenomenon has been well-documented in plastic and cosmetic surgery, where the desire for specific procedures often follows viral trends and influencer recommendations. Beyond surgical interventions, these societal pressures increasingly shape pharmaceutical usage, particularly concerning medications linked to weight loss and metabolic health. One such medication, Ozempic (semaglutide), has emerged as a notable example, gaining immense popularity among celebrities, social media influencers, and news media alike.

Ozempic (Novo Nordisk, Bagsværd, Denmark) belongs to a class of drugs called glucagon-like peptide 1 (GLP-1) receptor agonists. These agents mimic the natural GLP-1 hormone, which plays a crucial role in glucose metabolism by suppressing glucagon secretion and enhancing satiety. GLP-1 agonists, including semaglutide (marketed as Ozempic and Wegovy), tirzepatide (Mounjaro; Eli Lilly and Company), liraglutide, and exenatide, are primarily prescribed for managing type 2 diabetes mellitus (T2DM) and, in some cases, obesity. While Wegovy is FDA-approved specifically for weight management in individuals with obesity, Ozempic's FDA approval is limited to T2DM treatment. However, off-label use of Ozempic for cosmetic weight loss has surged, driven by social media hype and celebrity promotion, causing shortages that impact patients dependent on these medications for diabetes management.

## Impact of Social Media and Celebrity Influence

The emergence of phrases like “Ozempic parties” and “Ozempic face” in the media really shows how GLP-1 agonists have made their way into popular culture, far beyond their initial medical purpose. Nowadays, many people are turning to these medications through aesthetic providers, hoping for quick weight loss or those unique facial changes that come with the drug. Even though there’s a growing buzz around this topic, there’s still a lack of scientific research on the aesthetic effects of GLP-1 agonists, and the plastic surgery field is just starting to grasp how these medications fit into cosmetic practices. With this trend on the rise, it’s crucial for plastic surgeons and other aesthetic healthcare professionals to get acquainted with the pharmacology of GLP-1 agonists, their potential off-label uses, and any side effects they might have. Conducting a formal study to analyze public interest using tools like Google Trends can shed light on how popular these drugs have become over the last five years and underscores the importance of ongoing research and patient education<sup>[15]-[19]</sup>.

## Clinical and Real-World Evidence on Ozempic (Semaglutide)

The clinical profile of Ozempic goes beyond just managing diabetes; there's a growing body of evidence that highlights its benefits for weight loss and heart health. Recent studies have really emphasized how effective and safe this medication can be:

- **A systematic review and meta-analysis** found that non-diabetic obese adults who were treated with subcutaneous semaglutide experienced an impressive average weight loss of about 11.62 kg, showcasing its potential as a strong option for weight management.
- Real-world retrospective studies back up these results, revealing significant median weight loss within just three months of starting semaglutide for those who are overweight or obese.
- Clinical trials, including those published in the *New England Journal of Medicine*, show that semaglutide not only improves cardiovascular outcomes but also enhances functional capacity in patients dealing with obesity-related heart failure and type 2 diabetes.
- Furthermore, data from Novo Nordisk’s Phase 3 trials suggest that semaglutide can slow down the progression of kidney disease and boost quality of life for patients.

These clinical results position Ozempic as a versatile treatment option with important implications for diabetes, obesity, and associated health issues.

## The Need for Awareness in Aesthetic Medicine

As GLP-1 agonists gain popularity for aesthetic reasons, it's crucial for the healthcare community to fill in the knowledge gaps surrounding their off-label use. This includes understanding potential side effects, like the so-called “Ozempic face”<sup>[13]-[14]</sup> which involves a loss of facial volume, as well as the ethical implications of prescribing these medications for cosmetic purposes instead of medical needs. The rising demand has also led to a shortage of semaglutide products, which raises concerns for patients who genuinely need these drugs to manage diabetes.

Additionally, keeping an eye on public interest through tools like Google Trends can provide healthcare providers and policymakers<sup>[15]-[20]</sup> with valuable insights, allowing them to take a proactive stance in navigating the changing landscape of pharmaceutical use influenced by social and cultural trends.

## Use in Liver Transplant Recipients

The rise in obesity has sparked a surge in obesity-related liver diseases, leading some patients to require liver transplants due to end-stage liver disease caused by metabolic dysfunction–associated steatohepatitis (MASH). While being obese isn't an outright barrier to receiving a liver transplant, it significantly contributes to metabolic issues after the procedure. One of the ongoing challenges for liver transplant recipients is weight gain, which can be influenced by immunosuppressive drugs, genetic factors, and lifestyle choices.

In the case of liver transplant recipients (LTRs), semaglutide has emerged as a promising option for tackling post-transplant obesity. A study conducted by Richardson and colleagues looked at the use of GLP-1 receptor agonists in 44 LTRs over a year, revealing some encouraging outcomes in total body weight loss (TBWL), particularly at the 9 and 12-month marks. The results showed TBWL of 3.93%, 7.82%, and 7.87% at 3, 9, and 12 months for those on GLP-1RAs, compared to just 1.06%, 2.15%, and 4.24% for those using other anti-obesity treatments. While about 6.9% of patients reported side effects like nausea and vomiting, none of them stopped their treatment.

## The Role of GLP-1 Receptor Agonists in Managing Post transplant Obesity: A New Frontier in Liver Transplantation Care

The growing issue of obesity around the globe has led to a rise in liver diseases linked to metabolic problems, especially MASH. In serious cases, this can progress to end-stage liver disease, which may require a liver transplant. While obesity itself isn't a dealbreaker for getting a transplant, it can significantly affect the outcomes afterward due to its connection with other health issues like diabetes, high blood pressure, and heart disease.

It's not uncommon for patients to gain weight after their transplant, even if their body mass index (BMI) was 30 or lower before the procedure. This weight gain can happen for a variety of reasons, such as the effects of immunosuppressive drugs, genetic factors, and lifestyle choices. Moreover, conditions like post-transplant metabolic dysfunction–associated steatotic liver disease (MASLD) and MASH can impact as many as 50% of liver transplant recipients within a year of their surgery, often worsened by this weight gain.

### ***Current Therapeutic Landscape***

There are several options available for tackling obesity and MASH/MASLD, including medications, endoscopic bariatric therapies, and bariatric surgery. While these methods are becoming more common before transplants, there's still limited evidence on how effective they are for patients after the procedure<sup>[21]</sup>.

Among the medications, GLP-1 receptor agonists (GLP-1RAs) have shown promise. Drugs in this category, like semaglutide, have been effective in helping people lose weight and improve their metabolic health in non-transplant patients. However, their potential benefits for liver transplant recipients are just starting to attract scientific interest.

### ***Emerging Evidence from Retrospective Studies***

In a retrospective single-centre study, Richardson assessed the use of GLP-1RAs in 44 LTRs over 12 months<sup>[21]</sup>. The study aimed to evaluate total body weight loss (TBWL) at multiple time points, in addition to secondary outcomes such as incidence of cardiovascular events and T-cell-mediated rejection. GLP-1RAs were prescribed to 76% of patients, while others received different anti-obesity medications (AOMs). At 3, 9, and 12 months, TBWL in the GLP-1RA group was 3.93%, 7.82%, and 7.87%, respectively—significantly greater than the 1.06%, 2.15%, and 4.24% seen in the AOM group. Adverse events were limited to 6.9% of patients, primarily nausea and vomiting, with no treatment discontinuations.

Similarly, Chow et al. evaluated semaglutide in a smaller cohort of 23 LTRs. Of these, 83% experienced weight loss over an average follow-up of 17 months. At 12 and 18 months, patients demonstrated average weight losses of 8.4% and 5.8%, respectively. While this is less than the 14.9% weight reduction seen in phase III trials among the general population, the outcomes remain encouraging. Importantly, 65% of participants reported no side effects, although the study did not detail adverse events or the methods used for their identification.

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### **Limitations and Future Directions**

These two studies provide valuable insights into the potential of GLP-1RAs in managing obesity among LTRs. However, they come with limitations inherent to retrospective designs, including limited follow-up, potential underreporting of adverse events, and a lack of standardized treatment protocols. Prospective, multicenter studies are necessary to accurately evaluate the long-term safety, efficacy, and cardiovascular benefits of GLP-1RA therapy in transplant populations.

Another question that still needs answering is how GLP-1RAs stack up against other weight loss methods like bariatric surgery or endoscopic therapies. Previous research has shown that sleeve gastrectomy is both safe and effective, whether done during or after a transplant, leading to improvements in weight and metabolic health. Looking ahead, future studies should explore whether combining medication with surgical or endoscopic approaches could provide even greater benefits.

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### **Clinical and Ethical Considerations**

The issue of obesity among transplant recipients is quite similar to challenges faced by other transplant groups, like the problem of alcohol use in those with alcohol-related liver disease. Even though there are strict screenings for alcohol use before transplantation, the same level of assessment for obesity and eating disorders isn't as consistent. This gap really emphasizes the need for a more thorough evaluation and support system for patients dealing with obesity both before and after their transplant journey.

As GLP-1 receptor agonists (GLP-1RAs) are becoming the talk of the town and turning into a blockbuster treatment, it's crucial to conduct careful clinical evaluations. This helps prevent off-label misuse and ensures that the treatment is customized to fit each patient's individual medical and psychosocial needs.

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### **Conclusion**

The blend of celebrity culture, social media, and pharmaceutical use shows just how much public perception can influence medical practices and drug usage. The rise of Ozempic as a so-called "miracle" weight loss drug, beyond its original approval, underscores the importance of ongoing scientific research, patient education, and ethical prescribing. It's vital for those in the aesthetic and plastic surgery fields to stay updated on the growing role of GLP-1 agonists so they can better assist their patients and tackle the complex challenges that come with this trend. Ozempic (semaglutide) is proving to be a flexible treatment option beyond just diabetes, showing great promise for managing obesity, even in complicated cases like liver transplant recipients. Continued research is key to evaluating long-term safety and effectiveness across different patient populations.

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