



## **The use of semaglutide for weight loss: a literature review**

### **O uso da semaglutida para o emagrecimento: uma revisão de literatura**

**Gisele Karlec Jacobs, Laís Cristine Zanella Capponi, Maria Eduarda Kindel,  
Gabriel Diehl De Britto, Thiago Malaquias Fritzen**

#### **1 INTRODUCTION**

Obesity is one of the most relevant diseases in the current world scenario, in view of the proportion it has gained in recent decades and the consequent clinical repercussions and complications caused. In this sense, it is characterized by excessive accumulation of body fat at a level that compromises the health of the subject, causing losses that may involve metabolic changes, locomotor difficulties and potential risk factors for diseases, such as cardiovascular diseases, dyslipidemia, type 2 diabetes mellitus and some types of cancer (SABBÁ et al., 2022).

The diagnosis of obesity is obtained from a parameter established by the World Health Organization (WHO) - the Body Mass Index (BMI) - which relates body weight (kg) and height (m<sup>2</sup>) of individuals. Thus, a BMI between 25 and 29.9 indicates overweight, while values equal to or greater than 30 kg/m<sup>2</sup> characterize the individual as obese (LUSTOSA; FERNANDES; DE OLIVEIRA, [s.d.]).

Research shows that successful weight loss, between 5% and 10%, is already enough to induce relevant clinical and comorbidity-related improvements (CASTRO; REIS; PAIXÃO, 2022).

According to estimates, in Brazil the percentage of obese people in adulthood increased from 12.2% in 2003 to 26.8% in 2019. In the same period, the proportion of the adult population with overweight increased from 43.3% to 61.7%, which justifies the constant concern with the growth of this disease (6). In this sense, obesity is considered a multifactorial problem, and may be related to factors such as genetics, hormonal imbalance, lifestyle, diet, sedentary lifestyle, among others. It is worth mentioning that among the various damages caused to health, the psychological factor should also be emphasized, given the existing social pressure in search of the "perfect aesthetic" and the established standards, which are not always achieved in a healthy way (SABBÁ et al., 2022).

In the context of overweight/obesity, lifestyle changes in obese individuals through dietary intervention and increased physical activity are highly relevant in weight loss. However, it is a long and often ineffective process for a relevant portion of patients when associated with genetic and metabolic disorders. In this sense, the pharmacological treatment becomes a great ally against obesity, concomitant to individualized plan practices of routine changes (LUSTOSA; FERNANDES; DE OLIVEIRA, [s.d.]). Thus,



several drugs are already marketed for this purpose. Thus, this article seeks, through literature review, to evaluate the real effectiveness of the drug Semaglutide, intended for the therapy of type 2 diabetes, for the treatment of obesity, analyzing advantages and possible side effects compared to other drugs and methods of weight loss (SABBÁ et al., 2022).

## 2 OBJECTIVES

To conduct a literature search on the effectiveness of the drug Semaglutide in the treatment of obesity, and to evaluate its safety levels, indications for use, doses, and possible side effects.

## 3 METHODOLOGY

This article is a Literature Review based on articles published between 2020 and 2023 in the Scientific Electronic Library Online (SCIELO) and Online Medical Literature Analysis and Search System (MEDLINE/PUBMED) platforms, using the following descriptors: glp-1; obesity; semaglutide; pharmacological treatment; and their respective synonyms in Portuguese and English. We included only published articles that addressed the subject and were available online, within the established date. Articles outside the proposed period were excluded.

## 4 DEVELOPMENT

### **Current pharmacological and non-pharmacological treatment of obesity**

By predisposing to early death and the involvement of diseases, obesity is currently considered not only a disease but one of the most serious public health problems (PIRES WEBER et al., 2023), having shown an increase in prevalence of 100% between the years 2008 and 2018 (LUSTOSA; FERNANDES; DE OLIVEIRA, [n.d.]). Because it is a disease directly related to lifestyle and the energy imbalance between calories consumed and expended (KARINE; GOMES; TREVISAN, 2021) it is essential that healthy habits such as balanced diet and physical exercise be adopted (LUSTOSA; FERNANDES; DE OLIVEIRA, [n.d.]). However, it is known that behavioral measures may not be sufficient to change the picture due to metabolic changes of genetic origin and hormonal imbalance existing in obese individuals. Thus, complementary alternatives for the treatment of obesity can and should be used, reconciling the benefits of each therapy with the profile of each patient.

As a non-pharmacological treatment for obesity, besides behavioral changes, it is possible to perform bariatric surgery, with clear indications and already well established in the literature, which can ensure up to 40% weight loss within 1 year (LUSTOSA; FERNANDES; DE OLIVEIRA, [s.d.]).

Historically, pharmacological alternatives have been tested to treat the obesity disease. However, studies indicate that the short-term use of drugs is ineffective, since obesity is a chronic disease that requires



continuous treatment and, therefore, adjusted and planned for such (6). Thus, the long-term use of drugs tends to be beneficial to the patient when combined with non-pharmacological behavioral measures.

Semaglutide, a synthetic analog of incretin GLP-1, acts on this hormone with effects mediated by its receptors in the pancreas and brain (KARINE; GOMES; TREVISAN, 2021) slowing gastric emptying, inhibiting postprandial hyperglycemia, decreasing fasting glucose, raising postprandial insulin, decreasing glucagon secretion, and thus reducing appetite, increasing satiety and food intake by increasing the postprandial concentration of leptin and promoting the delay in emptying the stomach. Because it is a drug of peripheral action, it has better acceptance, better therapeutic results, and fewer side effects, and can be used long-term and continuously (KARINE; GOMES; TREVISAN, 2021). According to Gomes et al, semaglutide shows superiority when compared to other injectable therapies of the same class.

### **Mechanism of action of Semaglutide**

Semaglutide is primarily focused on the treatment of Type 2 Diabetes Mellitus. It also promotes weight loss through its action on intestinal receptors (GLP-1 or GLP-1R receptors), thus transmitting stimuli to the brain that promote satiety and appetite suppression (CASTRO; REIS; PAIXÃO, 2022). One of the mechanisms used by GLP-1 analogues that explains this satiety and appetite suppressing effect is the deceleration of gastric emptying, a well-known and documented action of such class of drugs (SRIDHAR et al., [n.d.]).

### **Semaglutide indication and dosage**

Semaglutide has regulatory approval for the treatment of Type 2 Diabetes Mellitus, being authorized for this purpose by the Food and Drug Administration (FDA) in 2017, the European Medicines Agency (EMA) in 2018, and the National Health Surveillance Agency (ANVISA) in 2018. The route of administration is subcutaneous injectable. In the therapy of Type 2 Diabetes Mellitus, doses are administered weekly, initially using a dose of 0.25mg for a period of 4 weeks. After this period, the dose is increased to 0.5 mg, also for a period of 4 weeks. Given the particularities and goals of the treatment, the doctor may adopt a dosage of 1mg after that. Semaglutide has recently obtained FDA clearance for the treatment of obesity. In Brazil, it has also been approved for this purpose, although it is not yet for sale. In this scenario, the initial dose is 0.25 mg once a week, increasing the dose every four weeks until the total dose of 2.4 mg is reached ("Ozempic ® 0.25 mg and 0.5 mg-Bula Profissional (v.1, EU-PI 20200722)", [n.d.]).

### **Level of Evidence of Safety and Side Effects**

Semaglutide is safe from a drug point of view, but one should always beware of indiscriminate use without medical follow-up. The main side effects reported are gastrointestinal tract disorders (such as



nausea, vomiting, diarrhea, constipation, and dyspepsia), and to a lesser extent, headache, nasopharyngitis (fever, nasal congestion, cough), hypoglycemia (when used with insulin or sulfonylureas without dose adjustment), and increased lipase levels have been reported in patients treated with semaglutide. Studies assess that side effects are dose-dependent and also transient, and may occur mainly in the first two weeks of treatment. The gradual dose progression aims to minimize this scenario.

### **SEM Requirement**

The treatment of obesity goes far beyond weight reduction because it is a multifactorial chronic disease and should be treated individually (PIRES WEBER et al., 2023). Thinking about weight reduction with immediate intention, without planned interventions related to lifestyle changes, favors weight regain, even when associated with drugs for weight reduction (PIRES WEBER et al., 2023). The maintenance of weight loss in obesity is not a natural process, since when the body starts to lose weight, it undergoes changes by caloric deficit, increasing hunger and decreasing satiety to try to return to the previous weight (KARINE; GOMES; TREVISAN, 2021). Thus, the weight loss process requires daily and continuous efforts in caloric restriction and change of habits in general (KARINE; GOMES; TREVISAN, 2021). The practice of exercises associated with healthy eating is one of the main strategies in combating obesity, which can be associated with medication without leaving aside the change in lifestyle (PIRES WEBER et al., 2023).

### **5 CONCLUDING REMARKS**

GLP-1 agonists, mainly liraglutide and semaglutide, even though they were developed for use in type 2 diabetes, have proven to be very effective in the treatment of obesity and overweight, becoming a safer option with fewer side effects than other drugs used. However, despite the relevant results, the side effects of long-term use of the drug are still unknown.

Due to the high cost of the treatment, compliance can be compromised, and each patient's condition must be individually assessed, and warnings given about possible undesirable effects during treatment and drug interactions, as well as adaptation of therapy according to their reality.

In addition, it is essential to combine medication with changes in the patient's lifestyle, including improvements in dietary quality and regular exercise, to ensure the long-term success of the treatment.

### **REFERENCES**

SABBÁ, H. B. O. et al. Ozempic (Semaglutide) for the treatment of obesity: advantages and disadvantages from an integrative analysis. *Research, Society and Development*, v. 11, n. 11, p. e587111133963, 2022.

LUSTOSA, A. M.; FERNANDES, K.; DE OLIVEIRA, S. O Uso Da Semaglutida No Tratamento De Pacientes Com Sobrepeso E Obesidade the Use of Semaglutide in the Treatment of Overweight and Obesity Patients Lindaynês Moreira De Ávila 3 Nathalia Gabriella Maciel Costa 4 Sônia Da Silva Cândido 5 Andreza Da Silva F. [s.d.].



CASTRO, B. R. DE; REIS, L. DA S.; PAIXÃO, J. A. DA. Segurança E Eficácia Da Semaglutida, Liraglutida E Sibutramina No Auxílio Do Tratamento Da Obesidade. *Revista Ibero-Americana de Humanidades, Ciências e Educação*, v. 8, n. 5, p. 2925–2941, 2022.

PIRES WEBER, T. et al. USO DO MEDICAMENTO SEMAGLUTIDA COMO ALIADO NO TRATAMENTO DA OBESIDADE. *RECIMA21 - Revista Científica Multidisciplinar - ISSN 2675-6218*, v. 4, n. 2, p. e422731, 17 fev. 2023.

KARINE, H.; GOMES, B. C.; TREVISAN, M. O uso do ozempic ( semaglutida ) como medicamento off label no tratamento da obesidade e como auxiliar na perda de peso. The use of ozempic ( semaglutide ) as off-label medication in the treatment of obesity and as an aid in weight loss. El uso de ozempic. *Acervo+ index base*, v. 29, n. June, p. 1–7, 2021.

SRIDHAR, V. S. et al. Making a case for the combined use of SGLT2 inhibitors and GLP1 receptor agonists for cardiorenal protection. *Braz. J. Nephrol. (J. Bras. Nefrol.)*, v. 42, n. 4, p. 467–477, 2020.

NOVO NORDISK. Ozempic ® 0,25 mg e 0,5 mg-Bula Profissional (v.1, EU-PI 20200722). . [s.l: s.n.].