

Comparison of weight loss induced by anti-obesity medications in Brazil: a systematic review

Comparaç o da perda de peso induzida por medicamentos anti-obesidade no Brasil: uma revis o sistem tica

Comparaci n de la p rdida de peso por medicamentos para obesidad en Brasil: una revisi n sistem tica

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REVISIA

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RESUMO

A obesidade   uma doena cr nica que gera comprometimento f sico, social e disfuncional ao indiv duo. Destarte, tratar essa doena se faz uma emerg ncia global e para isso, al m das mudanas de estilo de vida, os f rmacos anti-obesidade auxiliam este objetivo. Logo, cabe ao profissional de sa de estar atualizado, sobretudo no Brasil, sobre o que h  de melhor e novo para seu paciente. Esta revis o sistem tica utilizou as bases de dados "PubMed", "Scopus" e "Lilacs" a fim de encontrar os principais estudos que respaldam as evid ncias atuais sobre o funcionamento dos medicamentos aprovados no pa s. Os resultados evidenciaram que os an logos de GLP-1 e/ou GIP obtiveram maior perda de todas as op es dispon veis. Os IRSN foram os f rmacos com menor perda de peso dentre todos. Apesar dos melhores resultados, os an logos de incretinas possuem um valor elevado, destoando da realidade de seu p blico-alvo, o que se torna um fator limitante para sua ades o. Portanto, cabe ao m dico analisar, baseado no contexto do paciente, qual medicamento ser  includido para que se obtenha uma boa ades o e bons desfechos.

Descritores: Obesidade; Medicamentos; Perda de peso.

ABSTRACT

Obesity is a chronic disease that causes physical, social, and functional impairment in individuals. Therefore, addressing this disease has become a global priority, and in addition to lifestyle modifications, anti-obesity medications play a supportive role in achieving this goal. Consequently, healthcare professionals, particularly in Brazil, must remain updated on the most effective and innovative treatments available for their patients. This systematic review utilized "PubMed", "Scopus" and "Lilacs" databases to identify the main studies supporting current evidence regarding the mechanisms of action of medications approved in the country. The results indicated that GLP-1 and/or GIP analogues achieved the greatest weight loss among all available options. SNRIs were associated with the smallest weight reduction. Despite their superior efficacy, incretin analogues are expensive, which limits accessibility for the target population and may hinder adherence. Therefore, doctors must evaluate, based on the patient's context, which medication should be prescribed to maximize adherence and achieve favorable outcomes.

Descriptors: Obesity; Drug therapy; Weight loss..

RESUMEN

La obesidad es una enfermedad cr nica que genera deterioro f sico, social y funcional en el individuo. Por lo tanto, tratar esta enfermedad constituye una emergencia global, y adem s de las modificaciones en el estilo de vida, los f rmacos antiobesidad contribuyen a este objetivo. Corresponde al profesional de la salud, especialmente en Brasil, mantenerse actualizado sobre las mejores y m s recientes opciones para sus pacientes. Esta revisi n sistem tica utiliz  las bases de datos "PubMed", "Scopus" y "Lilacs" para identificar los principales estudios que respaldan la evidencia actual sobre el funcionamiento de los medicamentos aprobados en el pa s. Se incluyeron art culos de acceso gratuito publicados entre 2021 y 2025, art culos de renombre fuera de este per odo y ensayos cl nicos aleatorizados. Los resultados mostraron que los an logos de GLP-1 y/o GIP lograron la mayor p rdida de peso entre todas las opciones disponibles, mientras que los IRSN fueron los f rmacos con menor eficacia. Apesar de los mejores resultados, los an logos de incretinas tienen un costo elevado, lo que limita su accesibilidad y adherencia. Por lo tanto, el m dico debe evaluar, seg n el contexto del paciente, qu  medicamento incluir para lograr buena adherencia.

Descriptores: Obesidad; Medicamentos; P rdida de peso.

Introdução

Obesity is a chronic disease caused by excess adipose tissue that is related to the occurrence of various diseases, such as diabetes, systemic arterial hypertension, stroke, and various types of cancers.¹ Obese patients are those who have both hypertrophy and hyperplasia of adipose tissue, which can be documented either by bioimpedance or whole-body densitometry, or by a body mass index (BMI) greater than or equal to 30 kg/m² with some increased anthropometric measure, or by a normal BMI associated with two or more altered anthropometric measures.² Currently, obesity is divided into clinical, referring to obesity as a disease that generates functional impairment for the patient; and pre-clinical, which constitutes obesity as a risk factor for various other illnesses without directly resulting in functional impairment for the patient.²

Globally, approximately 1 billion people are obese. ³ Regarding Brazil, 25.9% of the adult population is considered obese, which highlights a moment of ascent for this epidemic, both in the world and national scenarios.⁴ Unfortunately, these data reveal that poor lifestyle habits, excessive screen time, sedentary behavior, and daily stress are causing people to expend fewer calories than they consume, ultimately culminating in weight gain.⁵ From this perspective, it is essential to slow down this growth, and for this purpose, measures are being taken to prevent this dangerous progression.

Lifestyle change is, without a doubt, the main tool regarding the treatment of obesity. A hypocaloric diet associated with nutritional re-education, psychological support, and physical activity constitute a very important tripod for the treatment of the disease in question.^{6,7} The World Health Organization recommends that physical exercise, at least 150 minutes per week, is of paramount importance as a foundation for weight loss and improvement of the pro-inflammatory metabolism observed in obesity.⁸

When such measures fail for a minimum period of 3 months, the addition of pharmacological therapy in association with the already discussed measures becomes necessary.⁹ In Brazil, there are several regulated drugs for the treatment of obesity; however, the rate of weight loss depends on the active ingredient and the time for which each substance is used, in addition to maintaining good lifestyle habits. These medications have several different mechanisms of action, and various uncomfortable adverse reactions may be experienced, which interfere with patient adherence to the therapeutic regimen. Thus, it is necessary to know which of the available medications in the country are offered, their contraindications, adverse reactions, their dosages, and, especially, the rate of weight loss provided and how long it takes to occur.

The main objective of this systematic review is to compare the weight loss provided by the various pharmacological treatments for obesity available in Brazil. Regarding the secondary objectives, this work aims to identify the main adverse reactions of these medications, summarize the initial treatment dose and contraindications, and provide pharmacological information regarding the active ingredient and mechanism of action, facilitating comparative analysis between pharmacological classes by health professionals.

Methodology

The present systematic review was produced based on the availability of articles consistent with the theme in the literature. For this, the PRISMA algorithm was used as the basis for its drafting. Furthermore, two reviewers were contacted to carry out this active search. Initially, the "Service of the United States Library of Medicine" (PubMed), "Latin American and Caribbean Health Sciences Literature" (Lilacs), and "Scopus" databases were consulted, in order to gather studies developed through different methodologies, enabling the critical and systematic analysis of their results.

The articles were collected using the following Health Sciences Descriptors (DeCS): "Weight Loss," "obesity," "drug therapy." The referred keywords were searched using the Boolean operators "AND" and "OR," being searched as "(obesity AND pharmacotherapy) OR (obesity AND weight loss)," totaling 105,330 works. Thus, the following inclusion criteria were defined: a) articles published between January 2021 and August 2025 (to cover current therapies) - leaving only 27,740 works; b) inclusion of large consolidated works for drugs already existing on the market outside the stipulated period - totaling 27,749; c) full and free access articles - leaving 17,954; d) articles categorized as clinical trials and randomized tests - leaving only 1,725 articles. In contrast, the exclusion criteria were listed as: a) duplicated articles; b) articles that lacked an abstract; c) articles that strayed from the review's theme; d) theses and dissertations; e) paid articles. After screening the exclusion criteria and reading the titles and abstracts, only 66 of the 1,725 articles remained. After a complete, thorough, and critical reading of these, only 8 works (n=8) were selected as objects of analysis to be discussed as results; 14 contained useful information to compose the theoretical framework of this work; and the remaining 44 were discarded.

Results

The results are shown in Table I.

Table 1 - Anti-obesity drugs available in Brazil until August 2025 and their characteristics

Authors and year (n = 8)	Active Ingredient	Initial Dose and Posology	Mechanism of Action	Weight Loss and Period Used	Adverse Reactions	Contraindications
Wadden, Thomas <i>et al.</i> (2021) ¹⁰	Semaglutide (Ozempic®)	0.25mg, subcutaneous route, weekly	GLP-1 Analog	10% to 15% in 68 weeks	Nausea, vomiting, dyspepsia, hyporexia, altered bowel habits	History of medullary thyroid carcinoma, multiple endocrine neoplasia

						syndrome type II (MEN2), pregnancy, and lactation
Kelly, Aaron et al. (2020)¹¹	Liraglutide (Saxenda®)	0.6mg, subcutaneous route, daily	GLP-1 Analog	12% to 14% in 56 weeks	Nausea, vomiting, dyspepsia, hyporexia, altered bowel habits	History (or family history) of medullary thyroid carcinoma, multiple endocrine neoplasia syndrome type II (MEN2), pregnancy, and lactation
Aronne, Louis et al. (2024)¹²	Tirzepatide (Mounjaro®) 12	2.5mg, subcutaneous route, weekly	GLP-1 and GIP Analog	20.9% in 36 weeks	Nausea, vomiting, dyspepsia, hyporexia, altered bowel habits	History (or family history) of medullary thyroid carcinoma, multiple endocrine neoplasia syndrome type II (MEN2), pregnancy, and lactation
James, W. et al. (2000)¹³	Sibutramine	Inhibitor of serotonin, norepinephrine, and dopamine reuptake	10mg, oral route, 1 tablet in the morning	8% in 24 weeks	Increase of 1–3 mmHg in BP, increased heart rate, insomnia, psychosis, worsening of psychiatric disorders, xerostomia, constipation, headache	History of risk or previous cardiovascular diseases, eating and psychiatric disorders, substance abuse, pregnancy, and lactation
Lyu, Young et al. (2024)¹⁴	Bupropion + Naltrexone (Contrave®)	Inhibitor of dopamine and norepinephrine reuptake + opioid antagonist	90mg/8 mg, oral route, 1 tablet in the morning	5.99% in 12 weeks	Xerostomia, insomnia, anxiety, headache, nausea, and vomiting	History of previous seizures or epilepsy, eating disorders, chemical substance abuse,

						pregnancy, and lactation
Finer, N. et al. (2000) ¹⁵	Orlistat	Pancreatic lipase inhibitor	120mg, oral route, 1 tablet with each meal (3 daily tablets)	8.5% in 52 weeks	Steatorrhea, meteorism, flatulence, fecal incontinence, abdominal pain	Chronic malabsorptive syndrome, cholestasis, pregnancy
Gill, Hartej et al. (2020) ¹⁶	SNRI	Varies according to the drug	Selective serotonin and norepinephrine reuptake inhibitors	0.5 kg in 52 weeks	Nausea, vomiting, insomnia, xerostomia, hyperhidrosis, constipation, hypertension	Concomitant use of MAOIs, angle-closure glaucoma, hepatopathy, pregnancy, and lactation
Wajid, Irza et al. (2023) ¹⁷	Topiramate	25mg, oral route, at night	Anticonvulsant	4.5% to 6.5% in 24 weeks	Paresthesia of extremities, hypovigilance, hyper-tenacity	Exportar para as Planilhas

Discussion

The present review systematically selected 8 studies, each discussing a different active ingredient used for the treatment of obesity in the country.¹⁰⁻¹⁷ Thus, the investigation of this work was based on the comparison of the weight loss provided by each of these medications. With the exception of SNRIs, all other approved drugs demonstrated therapeutic weight loss success, that is, a loss of at least 5% of body weight at the beginning of treatment, which is quite expressive and important for the management of this chronic inflammatory disease.¹⁶

Initially, it should be noted that the therapeutic success of substances mimicking endogenous incretins, such as Semaglutide, Liraglutide, and Tirzepatide, is ground-breaking and innovative, as they are redefining paradigms and approaches in the management of obesity treatment. Indeed, Tirzepatide is the medication with the highest potential for weight reduction: the study by Aronne et al. (2024) showed an impressive reduction of up to 20.9% of body weight in 36 weeks, something never seen before.¹² Such success can mainly be explained by its mechanism of action, which mimics not only GLP-1 but also GIP, providing a pharmacological synergism with potentiation of the expected effect.¹⁸ Furthermore, it should be noted that its initial dose is higher than the initial doses of semaglutide and liraglutide (2.5 mg versus 0.25 mg and 0.6 mg), which reinforces a greater concentration of the drug in the body.¹⁰⁻¹² The only apparent problem with this

medication, unfortunately, ends up being the price for the final consumer, as it becomes incompatible with the reality of most Brazilians, including obese people, which distances the treatment from those who really need it.

In turn, Liraglutide also provides similar loss, reaching up to 14% weight reduction in 56 weeks, as found in the study by Kelly et al. (2020).¹¹ As it is only a GLP-1 analog, its loss is limited compared to tirzepatide, although it is also considerable.¹⁸ One of the negative aspects related to this drug is its high cost. Added to this is the fact that its posology needs to be daily, which means the patient will have to self-inject every day, which can be a negative point for some patients.¹¹

Furthermore, semaglutide is slightly superior to liraglutide, reaching the mark of 15% body weight reduction in 68 weeks.¹⁰ Its mechanism is identical to the drug mentioned, and its price is also quite high.¹⁸ A positive aspect is the possibility, like tirzepatide, of weekly applications, which facilitates patient adherence to the treatment and reduces eventual discomfort with daily self-injection.^{10,12} Another beneficial point is the oral option, which is slightly cheaper than the subcutaneous version, which can be a good financial alternative for patients who cannot financially afford the subcutaneous treatment.¹²

Regarding the "older" substances already known in the market against obesity, there is a gap between them and the drugs described above. Sibutramine is the non-incretin analog medication—it is an antidepressant inhibitor of serotonin, norepinephrine, and dopamine reuptake—with the greatest potential for weight loss, reaching up to 8% weight reduction in 6 months.¹³ However, the history of sibutramine is quite troubled and criticized by some professionals. The SCOUT study (2010) is frequently cited for its tragic results, which showed the world that obese patients over 45 years old and with high cardiovascular risk had unfavorable cardiovascular outcomes with the use of sibutramine.¹⁹ However, this study focused only on this population. Thus, it can be considered that some populations may benefit from this medication, for example, young people without high cardiovascular risk. It should be noted that it is one of the cheapest substances for weight loss and should not be completely excluded from the medication arsenal for obesity, but rather directed to those who will truly benefit.

Subsequently, Orlistat is still a very interesting drug regarding weight loss, as it can reach the mark of 8.5% body weight reduction.¹⁵ As it is a lipase enzyme inhibitor, the absorption and digestion of fats are delayed, concentrating in the feces.²⁰ Perhaps this is the factor for which there is more abandonment of therapy with this drug: the presence of steatorrhea, flatulence, and meteorism are very uncomfortable adverse effects that make the patient abandon therapy.^{15,20} Its cost tends to be intermediate, and this can be a limiting factor.²⁰

Furthermore, the bupropion 90 mg+naltrexone 8 mg association is still recent in Brazil—dated 2023—but it presents good body weight reduction: about 6% in 3 months according to the study by Lyu et al. (2024).¹⁴ Although this combination was already found in Brazil, not in combined form, but individually compounded and off-label, the reference medication demonstrated better results, generating better treatment adherence and reduction of the adverse effects experienced by patients.¹⁴ Its negative point is the price, which, despite being cheaper than the GLP-1 analogs, is still inconsistent with the reality of those who need it.¹⁰⁻¹²

Topiramate is an anticonvulsant that offers good weight reduction, about 6.5% in 24 weeks.¹⁷ Despite its off-label use, such loss would be effective in bringing great benefits to the target audience, since its cost is not high. However, to have these benefits, higher doses of this medication are necessary, and with them, the side effects intensify—such as significant paresthesia of limbs and extremities and changes in attention—which are responsible for a large part of medication evasion.²¹

Finally, selective serotonin and norepinephrine reuptake inhibitors (SNRIs) show such little weight loss—rarely exceeding 1 kg—that studies do not even include them as alternatives for this purpose. On the contrary: some weight loss occurs in the initial period of antidepressant adaptation, and after it, some drugs, such as paroxetine, lead to weight gain.¹⁶

This systematic review, then, emphasized the relevance of the weight loss results generated by the drugs available in Brazil that are used for the management and treatment of obesity. It sought to cover the main new findings as well as consider already consolidated and older therapies. The evaluation of the ideal medication therapy for the obese patient is singular, is the responsibility of the physician, and must consider their singularities and particularities for good acceptance, permanence, and positive outcomes.

Conclusion

It is inferred, therefore, that all medications used to treat obesity in Brazil, except for SNRIs, act by generating significant weight loss, that is, a loss of 5% or more of the initial weight. The most significant are the GLP-1 and GIP analogs; however, their high price distances them from the final consumer. Given this, other options must be raised, considered, and discussed with the patient so that they can benefit from the best treatment for their socioeconomic context. Finally, with the arrival of new prototypes on the market, new reviews must be carried out with the aim of systematizing and condensing knowledge so that professionals always remain updated and with the best tools in hand.

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