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ORIGINAL RESEARCH

Effectiveness, persistence of use, and safety of orlistat and liraglutide in a group of patients with obesity

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ABSTRACT

Background: To determine the effectiveness, persistence of use, adverse reactions, interactions of orlistat and liraglutide taken for weight loss by a group of obese patients in Colombia.

Research design and methods: A retrospective follow-up study of a cohort of patients with obesity treated with orlistat or liraglutide. Sociodemographic, clinical, and pharmacological variables were identified. The effectiveness for weight loss at 12-16 and 52 weeks, persistence of use, and safety were determined.

Results: A total of 294 patients were followed up. At 12-16 weeks after starting orlistat and liraglutide, weight losses of -1.2kg (p=0.002) and -4.1kg (p<0.001) were observed, respectively, and at 52 weeks, reductions of -1.6kg (p=0.208) and -7.8kg (p<0.001) were observed. A total of 8.8% and 31.3% of patients treated with orlistat and liraglutide, respectively, persisted with treatment 1 year after initiation. A total of 17.3% had adverse drug reactions. Older adults with grade II or III obesity who performed physical activity and those treated with liraglutide were more likely to have lost at least 5% of their body weight at 12-16 weeks.

Conclusion: Orlistat and liraglutide users presented weight loss at 12–16 weeks. However, this effect was greater and sustained with liraglutide, especially when combined with physical activity.

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1. Introduction

People with obesity are characterized by having a disproportionate body weight for their height, with an abnormal or excessive accumulation of adipose tissue that is usually accompanied by chronic systemic inflammation [1]. It is a multifactorial disease with a complex pathogenesis related to biological, psychosocial, socioeconomic, and environmental factors, and there is great heterogeneity in the mechanisms by which it leads to adverse health outcomes [2]. It is correlated with an increased risk of chronic non-communicable diseases such as ischemic heart disease, arterial hypertension, cerebrovascular accidents, diabetes mellitus, dyslipidemia, osteoarthritis, and some neoplasms, among others [1,3]. The World Health Organization in 2016 estimated that more than 650 million people in the world were obese, representing 13% of the population aged 18 or over [3]. In Colombia, according to the Pan American Health Organization, the prevalence of obesity in men was 18.3% and in women 27.7% [4].

Diet, physical activity or exercise, and changes in lifestyle habits are the pillars of obesity management, but medical treatment and bariatric surgery are options that are becoming increasingly important [5–8]. Pharmacological management can be considered a complement to a comprehensive lifestyle intervention to achieve weight loss in patients with a body mass index (BMI) greater than 30 kg/m^2 or in those with some comorbidity related to obesity along with BMI ≥27 kg/m^2 [5–9]. Among the approved drugs are orlistat, lorcaserin, liraglutide, phentermine/topiramate, and naltrexone/bupropion [1,10], which have shown adequate efficacy in weight loss in controlled clinical trials [11–13].

In studies with real-life evidence, the clinical response may not be the same as that achieved in controlled environments [14]. In addition, studies on the use of these drugs in the Latin American population are scarce, and evaluation of the persistence of use and long-term results in patients with obesity are limited. The Colombian Health System offers universal coverage to the entire population through two affiliation regimes: the contributory one that is paid by workers and employers and the subsidized one that is responsible for the insurance of all people without the ability to pay, which includes a benefit plan that covers orlistat and liraglutide, the only drugs approved for weight loss [15]. The objective of this study was to determine the effectiveness, persistence of use, adverse reactions, and interactions of orlistat and liraglutide for weight loss in a group of obese patients in Colombia.

2. Patients and methods

An observational study was conducted to monitor a cohort of patients diagnosed with obesity who were treated with orlistat or liraglutide, in which sociodemographic, clinical, and

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pharmacological variables were analyzed. The patients were identified from a population database of drugs dispensed that collects information from approximately 8.5 million people affiliated with the Colombian Health System. Included were patients belonging to a health insurer that serves a population of approximately 2.7 million people in most regions of the country, affiliated with both the contributory regime (85%) and the subsidized regime (15%) of the Health System.

From this population, patients with a diagnosis of obesity (BMI ≥30 kg/m^2), aged 18 or older, of either sex and with any city of residence, who initiated pharmacological management with orlistat or liraglutide (Saxenda®) between February 1 and April 31, 2019 were selected. The date of initiation of drug use was considered the index date for each subject. Patients were followed for 12 months or until the definitive discontinuation of orlistat or liraglutide. People who changed insurance and those who were prescribed liraglutide or orlistat during the year before their index date (review since February 1, 2018) and those who were took the two medications at the same time were excluded.

During the study period, a total of 1246 people (777 taking orlistat and 469 liraglutide) who met the criteria were identified. A random sample of 294 patients was calculated using the Epi Info program, stratified according to the type of medication, with an equal number in the two strata, applying an error of 5%, a confidence level of 95%, and an expected frequency of 50%. For the selected patients, the electronic records of the medical records that were recorded during the observation period were reviewed. Patients without medical histories or who were overweight but not obese at the time of initiating pharmacological therapy were excluded.

From the information obtained, a database was designed where we collected the following groups of variables:

2.1. Sociodemographic

Sex, age, occupation, education, affiliation regime (contributory or subsidized), and residence. The residence was categorized by region of Colombia, using the classification of the National Administrative Department of Statistics of Colombia (DANE, for its name in Spanish), as follows: Bogotá-Cundinamarca region, Caribbean region, Central region, Eastern region, Pacific region, and Amazonia-Orinoquía region.

2.2. Clinical

a. Physiological variables: systolic blood pressure, diastolic blood pressure, waist circumference (centimeters), height (meters), weight (kg), and BMI. According to their BMI, patients were classified as having grade I obesity (30–34.9 kg/m^2), grade II obesity (35–39.9 kg/m^2), and grade III obesity (40 kg/m^2 or more).
b. Background: bariatric surgery and use of other unapproved medications to reduce weight.
c. Paraclinical: lipid profile (total cholesterol, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, triglycerides), fasting glycemia, glycosylated hemoglobin, and thyroid-stimulating hormone.
d. Comorbidities: arterial hypertension, diabetes mellitus, dyslipidemia, hypothyroidism, ischemic heart disease, heart failure, chronic obstructive pulmonary disease, asthma, osteoarthritis, depression, anxiety, acid-peptic disease, and others.
e. Cardiovascular risk: Cardiovascular risk was calculated according to the Framingham scale calibrated for Colombia, in which the original score was multiplied by 0.75 to perform the adjustment, and the values were categorized as low risk (<10%), moderate risk (10–20%), and at high risk (>20%). Patients with a history of atherosclerotic cardiovascular disease or with diabetes mellitus were considered high-risk patients [16].

2.3. Management

a. Nonpharmacological treatment: exercise, diet, nutritionist monitoring, psychology monitoring.
b. Pharmacological treatment: orlistat or liraglutide. For each of them:
   - Presentation, dose used, time of use and specialty of the prescribing physician.
   - Adherence to 1 year of follow-up was determined with the formula of drug possession rate = days covered of the drug dispensed/time × 100.
   - Persistence: Use of orlistat or liraglutide during the year of follow-up, without definitively suspending therapy and with a gap of less than 90 days between dispensations.
   - Effectiveness: The change in weight (difference in kg) was calculated at 12–16 weeks and 52 weeks after the index date and was categorized as a reduction of 1–4% of body weight (poor response), a reduction of 5–9% (good response), a reduction of 10–14% (very good response), and a reduction ≥15% (excellent response) [17].
   - Adverse drug reactions included diarrhea, steatorrhea, abdominal pain, emesis, pancreatitis, fecal urgency, nausea, constipation, dyspepsia, and cholelithiasis, and others.
   - Clinically relevant drug interactions: they were classified for severity according to the Micromedex® database. Contraindicated and major interactions were evaluated [18].
c. Medications related to weight gain: insulins (natural and analogs), sulfonylureas (glibenclamide, glimepiride and gliclazide), antipsychotics and affect stabilizers (clozapine, olanzapine, risperidone, quetiapine, chlorpromazine, haloperidol, lithium, valproic acid), imipramine, nortriptyline, mirtazapine, citalopram, escitalopram, paroxetine, duloxetine), and systemic glucocorticoids [19].
d. Comedications were grouped into the following categories: a) antidiabetics, b) antihypertensives and diuretics, c) lipid-lowering drugs, d) antiulcer drugs, e) analgesics and anti-inflammatories, and f) others.

The protocol was endorsed by the Bioethics Committee of the Technological University of Pereira in the category of 'research without risk' (approval code: CBE25-2019). The principles of confidentiality of information established by the Declaration of Helsinki were respected.

The data were analyzed with SPSS Statistics version 26.0 for Windows (IBM, USA). A descriptive analysis was performed with frequencies and proportions for the qualitative variables and measures of central tendency (median) and dispersion (interquartile range) for the quantitative variables. The initial weight was compared with that obtained at 12–16 weeks and at 52 weeks of follow-up in those who continued to receive the drug. Kolmogorov–Smirnov test was used to evaluate normality and determine the application of parametric or nonparametric tests accordingly. Quantitative variables were compared by Student's t test or the Mann–Whitney U test. Categorical variables were compared by the χ^2 test or Fisher's exact test. For the comparison of the median of the weights at the beginning and during the follow-up within each treatment group, Student's t test for paired-samples or the Wilcoxon signed rank test was used. Multivariate binary logistic regression models were developed that included the associated variables in the bivariate analyses, as well as those with sufficient plausibility or reported association, to identify those that could be associated with a reduction of at least 5% of body weight at 12–16 weeks (yes/no). The Hosmer–Lemeshow test was performed to calculate the goodness of fit. The predictive capacity of the model was determined according to the area under the curve. The level of statistical significance was $p < 0.05$.

3. Results

3.1. Sociodemographic variables

A total of 294 patients living in 14 different cities were analyzed. Three-quarters (75.9%, n = 223) were women, and the median age was 46.5 years (range:19.5–80.4 years). More patients resided in the Central region than anywhere else (n = 137; 46.6%). Most had a secondary (n = 124; 42.2%) or university education (n = 80; 27.2%). The most frequent occupation was related to household activities (n = 77; 26.2%). A total of 95.6% (n = 281) were affiliated with the contributory regime and 4.4% (n = 13) with the subsidized regime of the Colombian Health System. Table 1 compares sociodemographic variables between the orlistat and liraglutide groups.

3.2. Clinical variables

The median body weight was 99 kg (IQR:90–111 kg), the median BMI was 38.5 kg/m^2 (IQR:36.1–41.6 kg/m^2), and the median waist circumference was 112.0 cm (IQR:105.0–120.0 cm). The majority had grade II obesity (n = 138, 46.9%), and 88.4% (n = 260) had some chronic comorbidity, the most frequent being arterial hypertension (n = 164; 55.8%), diabetes mellitus (n = 106; 36.1%), and dyslipidemia (n = 93; 31.6%). Only 1.7% (n = 5) had a history of bariatric surgery. The median cardiovascular risk calculated according to the Framingham scale adjusted for Colombia was 4.7% (IQR:2.1–8.8%), which was higher in patients treated with liraglutide vs orlistat (5.9% vs. 4.0%; p = 0.010). A total of 41.8% (n = 123) of the cohort had a moderate to high cardiovascular risk. Table 2 compares the baseline anthropometric variables, the baseline paraclinical variables, and comorbidities between the orlistat and liraglutide groups.

3.3. Treatment

Most patients received nonpharmacological management (n = 292, 99.3%), mainly through changes in diet (n = 290, 98.6%) and indications for more physical activity (n = 224, 76.2%), with an average time spent on it of 149.5 ± 50.1 minutes per week (range:30–420 minutes). Three-fourths (75.5%, n = 222) of the patients were followed up by a nutritionist, with an average of 2.1 ± 1.3 consultations (range:1–8), while 49.0% (n = 144) were followed up by a psychologist, with an average of 2.3 ± 1.7 consultations (range:1–10) over 1 year.

Table 1. Sociodemographic variables of a group of patients with obesity who received orlistat or liraglutide, Colombia.

	Liraglutide		Orlistat		
Variables	n = 147	%	n = 147	%	p
Woman	105	71.4	118	80.3	0.076
Age, median (IQR)	47.3 (34.2–60.5)		46.0 (35.4–55.4)		0.578
<40 years	56	38.1	48	32.7	0.329
40–64 years	66	44.9	86	58.5	0.020
≥65 years	25	17.0	13	8.8	0.037
Origin	-	-	-	-	-
Central Region	72	49.0	65	44.2	0.413
Caribbean Region	46	31.3	27	18.4	0.010
Bogotá-Cundinamarca Region	15	10.2	35	23.8	0.002
Pacific region	7	4.8	10	6.8	0.453
Eastern Region	7	4.8	10	6.8	0.453
Occupation	-	-	-	-	-
Household activities	30	20.4	47	32.0	0.024
Operator	20	13.6	28	19.0	0.207
Seller	17	11.6	7	4.8	0.033
Student	7	4.8	8	5.4	0.791
Unknown	6	4.1	6	4.1	1.000
Driver	3	2.0	7	4.8	0.335*
Others	64	43.5	44	29.9	0.016
Scholarship	-	-	-	-	-
Primary	8	5.4	32	21.8	<0.001
Secondary	55	37.4	69	46.9	0.098
University	48	32.7	32	21.8	0.036

IQR: Interquartile range. *Fisher's exact test

Table 2. Clinical variables of a group of obese patients who received orlistat or liraglutide, Colombia.

	Liraglutide		Orlistat		
Variables	n = 147	%	n = 147	%	p
Anthropometric variables, median (IQR)	-	-	-	-	-
Initial weight (kg)	101.8 (94.0 – 116.0)		95.0 (87.0–105.0)		<0.001*
Weight at 12–16 weeks (n = 249) (kg)	97.0 (89.5–115.0)		92.0 (87.0–104.0)		0.009*
Weight at 52 weeks (n = 59) (kg)	98.3 (87.8–110.0)		93.0 (82.0–112.5)		0.421
Initial body mass index	39.5 (36.6–42.3)		37.8 (35.2–40.2)		<0.001*
Obesity grade I	16	10.9	32	21.8	0.012
Obesity grade II	63	42.9	75	51.0	0.161
Obesity grade III	68	46.3	40	27.2	0.001
Initial abdominal perimeter (cm)	112.0 (103.0–133.0)		114.5 (106.3–139.3)		0.197*
Blood pressure, median (IQR)	-	-	-	-	-
Systolic (mmHg)	118.0 (110.0–120.0)		119.0 (110.0–120.0)		0.993*
Diastolic (mmHg)	70.0 (70.0–80.0)		74.0 (70.0–80.0)		0.476*
Mean (mmHg)	88.0 (83.3–93.3)		89.3 (83.3–93.3)		0.726*
Paraclinical studies, median (IQR)	-	-	-	-	-
Total cholesterol (mg/dL)	160.0 (130.0–162.5)		214.0 (162.0–256.3)		0.411*
LDL cholesterol (mg/dL)	81.0 (71.0–85.6)		149.0 (96.0–169.8)		0.422*
HDL cholesterol (mg/dL)	52.0 (29.0–67.5)		41.9 (27.8–45.8)		0.911*
Triglycerides (mg/dL)	110.0 (60.5–150.0)		247.5 (160.5–372.8)		0.214*
Glycemia (mg/dL)	91.0 (90.0–99.0)		133.0 (115.3–218.3)		0.229*
Glycosylated hemoglobin (%)	5.8 (4.8–6.2)		7.9 (6.7–10.5)		0.756*
Thyroid-stimulating hormone (mIU/L)	1.9 (1.3–2.9)		1.3 (1.1–1.7)		0.084*
Comorbidities	134	91.2	126	85.7	0.145
Arterial hypertension	91	61.9	73	49.7	0.035
Diabetes mellitus	67	45.6	39	26.5	0.001
Dyslipidemia	52	35.4	41	27.9	0.168
Hypothyroidism	41	27.9	27	18.4	0.053
Anxiety	21	14.3	36	24.5	0.027
Osteoarthrosis	34	23.1	19	12.9	0.023
Depression	23	15.6	13	8.8	0.075
Obstructive sleep apnea syndrome	18	12.2	9	6.1	0.069
Chronic pain	9	6.1	16	10.9	0.143
Migraine	11	7.5	5	3.4	0.123

IQR: Interquartile range. *Mann-Whitney U test.

Most of the patients who took orlistat (n = 143; 97.3%) or liraglutide (n = 139; 94.6%) reached the maximum dose of the drug. It was prescribed mostly by general practitioners (n = 193; 65.6%) and family physicians (n = 62; 21.1%). A total of 84.7% (n = 249) still took the medication at 12–16 weeks, 23.7% (n = 59/249) of these achieving the goal of at least 5% weight loss.

In the liraglutide group, the differences between the starting weight and the weights at 12–16 weeks (–4.1 kg; n = 126) and at 1 year of treatment (–7.8 kg, n = 46) are shown in Table 2. Both weight losses were statistically significant ($p < 0.001$). In the orlistat group, the mean weight loss at 12–16 weeks was significant (–1.2 kg; n = 123; p = 0.002), but not at 1 year of treatment (–1.6 kg; n = 13; p = 0.208). Figures 1 and 2 show the weight changes for each molecule at 12–16 weeks and at 1 year of follow-up.

A total of 53.4% (n = 157/294) of all patients took the medication continuously for the first 12 weeks, of whom 26.8% (n = 42/157) achieved at least 5% weight loss. A total of 20.1% (n = 59/294) were still taking orlistat (n = 13/147; 8.8%) or liraglutide (n = 46/147, 31.3%) at 12 months after starting treatment, with a median drug possession rate of 75.0% (range:33.0–100.0%) and at least 5% weight loss in 54.2% (n = 32/59) of these patients. In the orlistat group at 12 months, only two patients had presented a ≥ 5% weight reduction at 12–16 weeks (2/13, 15.4%), compared with 24 patients in the liraglutide group (24/46, 52.2%). Table 3 shows compares pharmacological variables between the orlistat and liraglutide groups. Weight reduction was significantly greater in the group treated with liraglutide (Table 3).

On the other hand, 17.3% (n = 51) of the patients presented some adverse drug reactions, predominantly of the gastrointestinal tract (Table 3). A total of 79.9% (n = 235) definitively discontinued therapy during the year of follow-up, especially the users of orlistat, mainly because they did not reach their treatment goals (n = 125, 42.5%) and because of the occurrence of adverse drug reactions (n = 21; 7.1%) (Table 3). A total of 7.5% (n = 22) switched medications to lose weight (18 changed to liraglutide and four to orlistat).

Comedications were found in most patients (n = 284, 96.6%), mainly analgesics and anti-inflammatory drugs (n = 219; 74.5%), antidiabetic drugs (n = 167; 56, 8%), and antihypertensives and diuretics (n = 156; 53.1%). A total of 16.0% (n = 47) of patients took metformin without having a diagnosis of diabetes mellitus, especially those who were taking orlistat (23.1% vs. 8.8%; p = 0.001). Of the pharmacological interactions evaluated, those classified as more significant were identified in 11.2% (n = 33/294) of patients, mainly between orlistat and antiepileptics (n = 13/147; 8.8%), between liraglutide and insulins (n = 10; 6.8%), and between liraglutide and fluoroquinolones (n = 10; 6.8%). There were no contraindicated interactions.

3.4. Multivariate analysis

The binary logistic regression adjusted for sex, age, origin, education, cardiovascular risk and comedications found that those aged 65 years or older, with obesity grade II or III, who performed physical activity, and who received liraglutide had

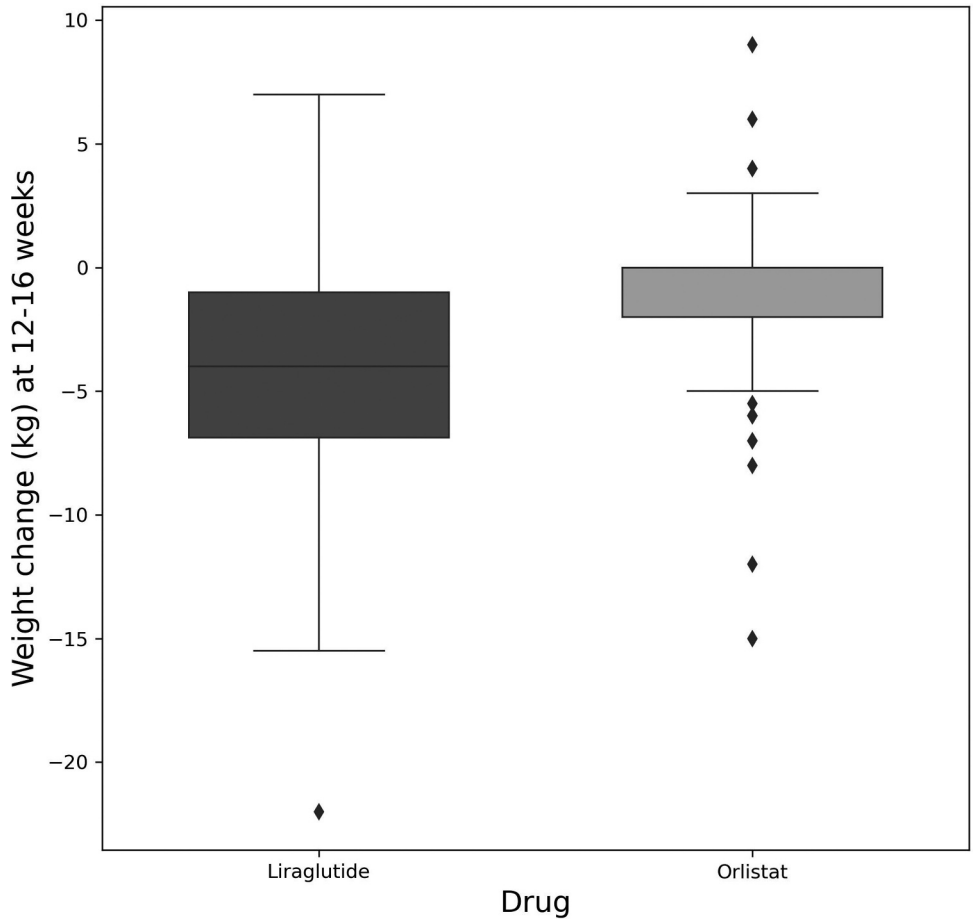

Figure 1. Changes between starting weight and weight at 12–16 weeks in patients treated with liraglutide (n = 126) and orlistat (n = 123).

a greater probability of losing at least 5% of their body weight at 12–16 weeks after starting therapy. No variable was correlated with decreasing this probability (Hosmer–Lemeshow test p = 0.774 and area under the curve = 0.805) (Table 4).

4. Discussion

This study compares the effectiveness, persistence, and adverse reactions of orlistat and liraglutide, using information from the clinical records of a group of patients with obesity affiliated with the Colombian Health System. Data from real-world environments offer the opportunity to evaluate the efficacy found in controlled clinical trials but in the general population, allowing healthcare, academic, and scientific personnel to use the clinical results of these two drugs, as well as the risks faced by patients, in their decision-making, thus strengthening the practices that lead to an adequate use of these drugs.

According to clinical practice guidelines, the management of obese patients should be comprehensive and individualized, involving behavioral therapies, reductions in calorie consumption, and increases in physical activity [5–9]. Furthermore, a recent randomized trial highlights the importance of continued interventions in physical activity, eating and sedentary habits to maintain weight loss [20]. A quarter of the patients in this cohort were not followed by a nutritionist, which is lower than that reported in the United States (41.3%) [21], while one-fifth of the subjects did not perform physical activity, similar to what was identified in Canada (13.2%) [22] but different from that found in Korea (76.3%) [23]. The above is especially relevant since those patients who receive comprehensive management that includes the promotion of healthy lifestyles in addition to pharmacological therapy have better weight control [24–27].

In liraglutide users, the weight loss at 12 and 16 weeks was −4.1 kg, which is consistent with reports from Switzerland and Korea (−4.2 to −4.4 kg) [23,28] but lower than that found in Canada, Spain, and Saudi Arabia (−6.4 kg to −8.1 kg) [22,29,30]. For the case of orlistat, the reduction was −1.2 kg, which is lower than previous amounts (−2.2 to −3.8 kg) [25,30–32]. Similarly, the proportion of patients with at least 5% weight loss at 12–16 weeks was higher in those who took liraglutide, consistent with a previously report from Spain [30]. These differences in effectiveness have not only been identified in studies with real-world evidence [33] but have also been documented in clinical trials [11–13]. Several meta-analyses of clinical trials have documented a reduction of −5.3 to −5.5 kg with liraglutide [11,13] and from −2.9 to −3.1 kg with orlistat [11,12]. Therefore, in this cohort of patients, weight loss with orlistat was lower than that found in other studies with real-life evidence [25,30–32] and in clinical trials [11,12], while for liraglutide, the loss was similar to

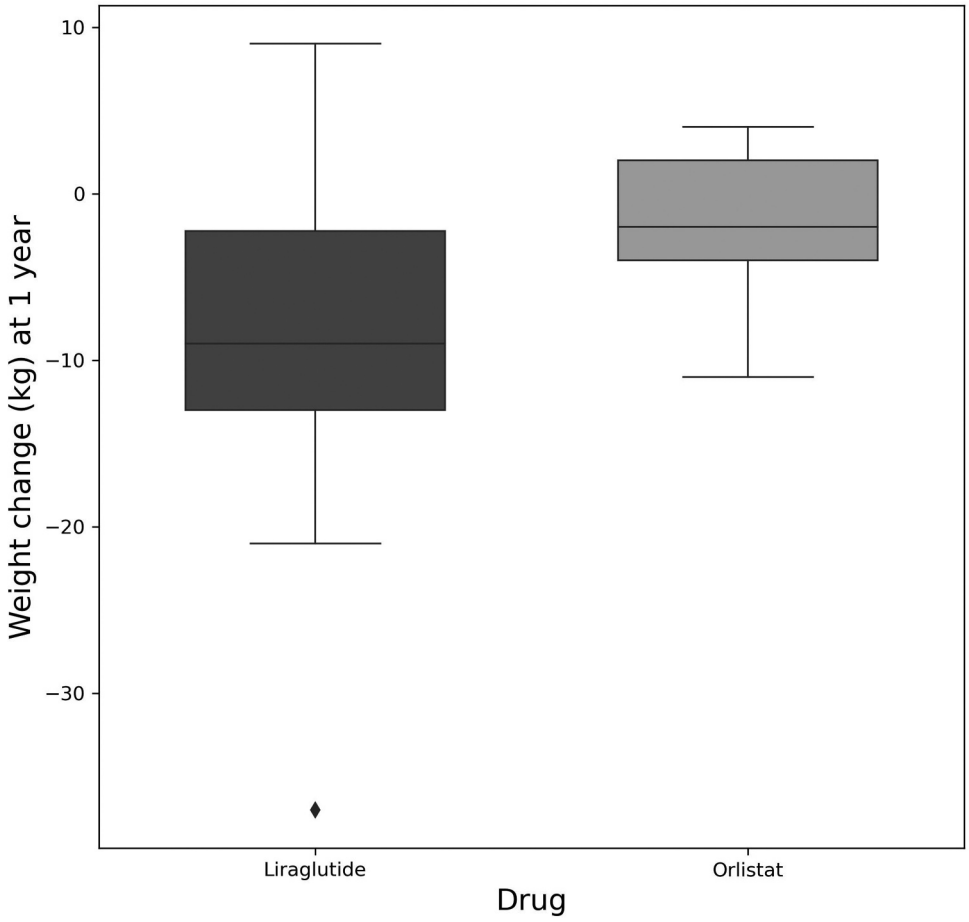

Figure 2. Changes between starting weight and weight at 1 year in patients treated with liraglutide (n = 46) and orlistat (n = 13).

some findings from real-life evidence [23,28] and slightly lower than that described in clinical trials [11,13].

The effectiveness of these therapies will depend on aspects such as persistence, dose, tolerability to the drug, and comedications that hinder weight loss. In this analysis, the persistence of liraglutide therapy at 12–16 weeks was 85.7%, which is consistent with that found in studies conducted in Belgium and Switzerland (80.9–85.0%) [28,34], while in Canada and Korea the persistence was lower (31.4–67.5%) [22–24,35]. In contrast, for orlistat, research has shown a much lower persistence (25.5–64.8%) [25,30,31] than we found. In addition, we found that the use of these medications decreases over time, which is consistent with other reports [21,23,28,30]. The main cause of the abandonment of pharmacological therapy is the limited effectiveness of the treatment [23,30], which was also evidenced in this report. This is supported by some recommendations that indicate stopping the drug at 3 months if there has not been at least 5% weight loss [7,9].

The majority of patients reached the maximum doses for each drug, contrasting with other reports in which the proportion of those who reached this dose was lower [21,28,30,34]. The main adverse drug reactions were those of the gastrointestinal tract, present in almost one-fifth of all patients, without significant differences between orlistat and liraglutide. This is consistent with what was found by Ahmad *et al*. In a systematic review of studies with real-world evidence on weight-loss drugs. They showed that the main adverse reactions of orlistat and liraglutide were of the gastrointestinal tract [33]. These adverse reactions can also contribute to the abandonment of therapy, as evidenced in this report and in the literature [21,23,30,34]. Various medications can decrease the apparent effectiveness of orlistat and liraglutide by increasing body weight [19]. Patients under pharmacological management for obesity frequently receive concomitant sulfonylureas, insulins, or antipsychotics [23,25,31], with findings consistent with ours.

Different variables were correlated with a higher probability of losing at least 5% of body weight at 12–16 weeks after starting liraglutide or orlistat. In this report, older adults had a greater probability of achieving this weight loss, consistent with Calderón *et al* [21] but in contrast with other studies in which age did not modify this probability [25,31]. On the other hand, those with more severe obesity had a greater weight loss, which is consistent with what was found by Grabarczyk *et al* in the USA in patients who received orlistat [25]. Similarly, those who performed physical activity concomitantly with pharmacological therapy had better results, which has been widely evidenced in the literature [20,26,27,36]. Finally,

Table 3. Pharmacological variables of a group of patients with obesity who received orlistat or liraglutide, Colombia.

	Liraglutide		Orlistat		
Variables	n = 147	%	n = 147	%	p
Non-pharmacological management	-	-	-	-	-
Physical activity	120	81.6	104	70.7	0.028
Diet	144	98.0	146	99.3	0.314
Nutritionist follow-up	96	65.3	126	85.7	<0.001
Psychology follow-up	59	40.1	85	57.8	0.002
Initial prescriber of orlistat or liraglutide	-	-	-	-	-
General practitioner	76	51.7	117	79.6	<0.001
Family doctor	36	24.5	26	17.7	0.153
Internal Medicine/Geriatrician	28	19.0	4	2.7	<0.001
Endocrinologist doctor	7	4.8	0	0.0	0.015*
Use of orlistat or liraglutide at 12–16 weeks (n = 249)	126	85.7	123	83.7	0.627
1–4% weight reduction	45	35.7	42	34.1	0.795
≥5% weight reduction	50	39.7	9	7.3	<0.001
5–9% reduction	40	31.7	7	5.7	<0.001
10–14% reduction	8	6.3	2	1.6	0.103*
≥15% reduction	2	1.6	0	0.0	0.498
No weight loss	31	24.6	72	58.5	<0.001
Continuous use of orlistat or liraglutide at 12 weeks (n = 157)	81	55.1	76	51.7	0.559
1–4% weight reduction	27	33.3	27	35.5	0.401
≥5% weight reduction	36	44.4	6	7.9	<0.001
5–9% reduction	30	37.0	4	5.3	0.003
10–14% reduction	5	6.2	2	2.6	0.444*
≥15% reduction	1	1.2	0	0.0	1.000*
No weight loss	18	22.2	43	56.6	0.007
Use of orlistat or liraglutide at 52 weeks (n = 59)	46	31.3	13	8.8	<0.001
Medication possession rate (%), median (IQR)	75.0 (66.6–91.6)		75.0 (66.6–91.6)		0.739
1–4% weight reduction	6	13.0	5	38.5	0.038
≥5% weight reduction	29	63.0	3	23.1	0.014*
5–9% reduction	12	29.1	2	15.4	0.713*
10–14% reduction	13	28.3	1	7.7	0.159*
≥15% reduction	4	8.7	0	0.0	0.566*
No weight loss	11	23.9	5	38.5	0.297
Adverse drug reactions	28	19.0	23	15.6	0.441
Abdominal pain	12	8.2	7	4.8	0.236
Diarrhea	10	6.8	7	4.8	0.453
Dyspepsia	10	6.8	7	4.8	0.453
Steatorrhea	1	0.7	10	6.8	0.010*
Permanently discontinued the drug	101	68.7	134	91.2	<0.001
Reasons for suspending the drug	-	-	-	-	-
Did not reach goals	55	37.4	70	47.6	0.077
Adverse drug reactions	12	8.2	9	6.1	0.497
Administrative problems	6	4.1	7	4.8	0.777
Reached goals	2	1.4	7	4.8	0.173*
Patient non-adherence	4	2.7	3	2.0	1.000*
Performing bariatric surgery	3	2.0	0	0.0	0.247*
Psychiatric pathology that makes its use difficult	2	1.4	0	0.0	0.498*
Unknown	24	16.3	41	27.9	0.017

IQR: Interquartile range. *Fisher's exact test.

Table 4. Binary logistic regression of the variables related to the reduction of at least 5% of body weight at 12–16 weeks after starting therapy with orlistat or liraglutide, Colombia.

			CI95%	
Variables	Sig.	OR	Lower	Upper
Woman	0.070	2.172	0.939	5.022
Age <40 years	0.086	Reference	Reference	Reference
Age 40–64 years	0.250	1.579	0.725	3.437
Age ≥65 years	0.028	3.785	1.157	12.386
Origin Region Bogotá-Cundinamarca	0.467	0.650	0.203	2.078
Primary schooling	0.271	0.413	0.086	1.992
Obesity grade II–III	0.043	4.839	1.050	22.307
Moderate-high cardiovascular risk	0.099	0.514	0.233	1.133
Doing physical activity	0.040	3.163	1.051	9.518
Management with nutritionist	0.255	1.692	0.684	4.188
Management with psychology	0.725	0.871	0.404	1.879
Liraglutide treatment	<0.001	7.460	3.169	17.562
Co-medication with metformin (non-diabetics)	0.377	0.601	0.194	1.860
Medications related to weight gain	0.843	1.105	0.411	2.973

Sig: Statistical significance; OR: Odds Ratio; CI: Confidence Interval.

liraglutide was associated with a greater weight loss than orlistat, as evidenced in real-world studies [33] and randomized clinical trials [11–13].

Some limitations should be considered when interpreting our results. Our data were obtained from a group of patients from an insurer of the contributory and subsidized regime of the Colombian Health System, so the findings may not be extrapolated to other health promotion companies or to people without affiliation. Body weight data were taken from the medical records and not from the records of properly calibrated and approved scales. In addition, for some variables, information was not available for all patients because of incomplete medical records. Also, our results should be interpreted considering the descriptive design: it was not intended to test any hypothesis, the medication groups presented several differences regarding relevant variables (such as initial weight or comorbidities) and there was an important population loss at follow-up due to drug withdrawal (which affects statistical power). One strength was that the study included patients from most regions of the country.

5. Conclusion

With this descriptive analysis, we can conclude that orlistat and liraglutide users presented weight loss at 12–16 weeks. However, this effect was greater and sustained with liraglutide, especially when combined with physical activity, and without significant differences in adverse drug reactions. In addition, older adults, those with a higher BMI, and those who performed physical activity were also those who were more likely to have lost at least 5% of their body weight at 12–16 weeks after starting the medication. In general, the persistence of treatment at 52 weeks was low, but it was significantly higher in those taking liraglutide.

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Declaration of interest

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Author contributions

L F Valladales-Restrepo participated in the drafting, data collection, data analysis, description of results and discussion. N Sánchez-Ramírez: formal analysis, investigation, data curation. A F Usma-Valencia: formal analysis, investigation, data curation. A Gaviria-Mendoza: methodology, formal analysis, investigation, data curation. M E Machado-Duque: methodology, formal analysis, investigation, data curation. J E Machado-Alba participated in the drafting, data analysis, description of results, discussion, critical revision of the article, and evaluation of the final version of the manuscript.

Author responsibility

The corresponding author confirm full access to all data in the study and final responsibility.

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Code availability

https://www.protocols.io/private/3884024A5BAD11EDB6580A58A9FEAC02

Data availability statement

The data that support the findings of this study are openly available in protocols.io

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