Research Article

Evaluation of the Effect of Liraglutide Used in Obesity Treatment on Quality of Life

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Received: 08-Jul-2024, Manuscript No. amhsr-24-142911;
Editor assigned: 10-Jul-2024, Pre QC No. amhsr-24-142911 (PQ);
Reviewed: 24-Jul-2024, QC No. amhsr-24-142911;
Revised: 01-Aug-2024, Manuscript No: amhsr-24-142911 (R);
Published: 07-Aug-2024, DOI: 10.54608.annalsmedical.2024.163

Abstract

Introduction: Obesity is characterized by excessive fat accumulation in the body, influenced by genetic factors, dietary habits, physical activity, hormonal imbalances and environmental factors. Liraglutide, a medication used to treat obesity, mimics the hormone GLP-1, which affects appetite control in the brain, promotes satiety and reduces food intake. It also regulates gastric emptying, aiding digestion and maintaining blood sugar balance. This study aims to evaluate the effect of liraglutide on the quality of life in obese patients.

Methods: This study is descriptive and retrospective. A total of 274 participants were included, with 137 participants in the control group and 137 participants in the treatment group. A total of 137 patients were started on liraglutide treatment during this period. At the initial visits, participants were asked to complete a Short Form 36 (SF-36) quality of life scale along with a socio-demographic questionnaire. Baseline characteristics were evaluated using descriptive statistics.

Results: It was found that patients who used 3.0 mg liraglutide for a total of 8 weeks had significantly lower weight and BMI values compared to those not using the medication. Although both groups did not respond equally to treatment and there was no significant difference in terms of quality of life scores at baseline, significantly lower weight and BMI values were found in the group using 3.0 mg liraglutide. Following liraglutide treatment, a significant improvement was observed in physical, psychological, social health as measured by the SF-36 questionnaire.

Conclusion: An eight week treatment with liraglutide in obese patients resulted in significant weight loss and improved quality of life. Including disease-specific and general quality of life measurements in clinical studies related to obesity could be beneficial.

Keywords: Obesity; Liraglutide; Quality of life

Introduction

Cardiovascular obesity is a health condition characterized by excessive fat accumulation in the body. Obesity can arise due to the interaction of various factors including genetic factors, dietary habits, level of physical activity, hormonal imbalances and environmental factors [1-3].

Liraglutide is a medication used in the treatment of obesity. It mimics a hormone called Glucagon-Like Peptide-1 (GLP-1) and influences appetite control in the brain, creating a sense of fullness, thereby aiding in eating less. Additionally, it can regulate the emptying of the stomach, thus regulating the digestion process and helping to balance blood sugar [4].

There is a complex relationship between obesity and quality of life. Obesity can be associated with a range of physical, emotional, social factors that may negatively impact an individual's quality of life. Fighting obesity generally leads to an improvement in quality of life. Weight loss can enhance physical health, boost self-confidence, uplift mood. Embracing a healthier lifestyle through regular exercise and balanced nutrition can positively impact overall health and consequently, quality of life. However, this varies for each individual and isn't solely tied to weight loss. Factors such as emotional and social well-being, physical health and lifestyle choices can influence the quality of life associated with obesity, necessitating a personalized approach. Treating obesity requires a multidisciplinary approach tailored to meet individual needs [5,6].

Liraglutide, like other medications, can improve the quality of life in obesity treatment for several reasons:

Assisting in weight loss

By supporting weight loss in combating obesity, it can enhance physical health. Achieving a healthier body weight often leads to positive effects on physical activity, energy levels, overall health.

Regulating blood sugar control

Liraglutide can help balance blood sugar levels. This can contribute to preventing health issues associated with obesity, such as diabetes.

Improving mood and confidence

Stress, low self-esteem, mood changes associated with obesity can decrease with weight loss and better health, subsequently enhancing overall quality of life.

However, like any medication, liraglutide can have potential side effects that vary from person to person. Therefore, potential side effects related to its use and individual circumstances should be considered. Regular monitoring and consultation with a doctor before and during the medication's use are important

How to Cite this Article: Yildirim DI. Evaluation of the Effect of Liraglutide Used in Obesity Treatment on Quality of Life. Ann Med Health Sci Res. 2024;14:1005-1009.

to determine the appropriate dosage and monitor side effects. Additionally, lifestyle changes (such as healthy eating and regular exercise) alongside medications like liraglutide can result in more effective outcomes in obesity treatment and improve the quality of life [7-10].

The effects of medications like liraglutide on quality of life should be individually assessed, the treatment process should be managed with regular medical supervision. The aim of this study is to evaluate the effect of liraglutide used in the treatment of obesity on quality of life.

Materials and Methods

This study was conducted with a total of 274 obese participants (n=137 control group and n=137 treatment group using 3.0 mg liraglutide). This study is a descriptive, cross-sectional, retrospective study. It is planned to be conducted by retrospectively scanning the registered patient files of individuals who applied to the family medicine outpatient clinic to lose weight between the dates of September 5, 2022 and December 31, 2023. The study will utilize patient data that has been examined and treated by the responsible researcher within the specified period and contains all the required values in the files. A total of 137 patients were initiated on liraglutide treatment during this period, upon their initial visit, they were asked to complete a socio-demographic questionnaire along with the Short Form (SF-36) quality of life scale. Patients who discontinued the medication after a total of eight weeks were asked to complete the Short Form 36 quality of life scale again.

Inclusion criteria

- Age ≥ 18 years
- Male or female
- Body Mass Index (BMI) ≥ 30 kg/m^2
- Continued liraglutide treatment for 8 weeks
- No other weight control measures or medical/drug history within the last 3 months for a total of 137 patients

Exclusion criteria

- Individuals with endocrine disorders such as thyroid or pituitary disorders
- Those with heart diseases, arrhythmia, heart failure, myocardial infarction, or with a heart pacemaker
- Patients with allergies or immunological disorders
- Individuals prone to bleeding
- Pregnant or breastfeeding women
- Those with liver or kidney function impairment
- Individuals who have had a stroke or are unable to exercise in any way
- Patients using any continuous medication

Patients meeting the inclusion criteria will be included in the study, while those not meeting these criteria will be excluded.

The Short Form 36 Health Survey (SF-36): Commonly used to assess quality of life, is one of the frequently employed scales for this purpose. Developed by Ware and colleagues in 1992, its Turkish validity and reliability were established by Koçyiğit and colleagues [9,10].

Comprising a total of 36 items, this self-assessment scale encompasses 8 different dimensions [11,12]:

- Physical Functioning: 10 items
- Social Functioning: 2 items
- Role Limitations due to Physical Problems: 4 items
- Role Limitations due to Emotional Problems: 3 items
- Mental Health: 5 items
- Energy/Vitality: 4 items
- Pain: 2 items
- General Health Perception: 5 items

Except for the second question, which evaluates participants' overall perception of health changes in the past year, the other questions assess patients' recent conditions within the last four weeks. Questions 4 and 5 of the scale are answered in a yes/no format, while other health-related items are measured using a Likert-type scale.

When assessing subcategories, the scale ranges from 0 to 100, where 100 indicates excellent health and 0 indicates poor health [13,14]

Statistical analysis

Baseline characteristics were evaluated using descriptive statistics. Differences in absolute changes in HRQoL scores from Week 0 to Week 8 between treatment groups were assessed using Analysis of covariance (ANCOVA) with treatment, gender, BMI stratification groups (<30, ≥ 30 kgm^2) as fixed factors, baseline HRQoL scores (at Week 0) as covariates. Health utility scores were analyzed using a similar model.

The data were checked for normal distribution using the Kolmogorov-Smirnov test. Differences at baseline between groups were analyzed using independent t-tests for continuous data (Mann–Whitney U tests for non-normally distributed data). Frequency distributions were calculated using the chi-square test. Post-intervention comparisons between groups were conducted as follows: For each group (liraglutide and control), the percentage change from baseline to 8 weeks was calculated. Group differences were compared using independent t-tests (or Mann–Whitney U tests for non-normally distributed data). Differences between treatment groups were estimated and presented with a two-sided 95% Confidence Interval (CI) and a p-value representing a test for treatment difference.

Results

Participant characteristics

A total of 274 participants were selected retrospectively (n=137 control; n=137 using liraglutide). The planned duration was 8 weeks. The effects of liraglutide, used in obesity treatment for a total of 8 weeks, on quality of life were evaluated. Table 1

shows the sociodemographic characteristics and BMI values of patients in the treatment group who used 3.0 mg liraglutide for 8 weeks and the control group who did not use any medication for 8 weeks.

Anthropometric measurements

Weight (kilograms) and Body Mass Index (BMI) was calculated as weight(kg)/the square height (meters).

The Short Form 36 Health Survey (SF-36)

Intervention with liraglutide

In Table 2, participants' anthropometric measurements and quality of life scores before and after Liraglutide treatment are presented. Patients using 3.0 mg liraglutide over a total of 8 weeks were found to have significantly lower weight and BMI compared to those not using medication (respectively $p<0.001$; $p<0.001$).

Although both groups did not respond equally to treatment and there was no significant difference in quality of life scores between them at baseline, the group using 3.0 mg liraglutide had significantly lower weight and BMI values. Significant improvement in physical, psychological and social health was found in the SF-36 questionnaire after liraglutide treatment (Table 2).

Table 1: Subject demographics and baseline characteristics (observed means ± SD) for the total trial population.

Variable	Liraglutide (n=137)		Liraglutide 3.0 mg (n=137)	
Gender	n	%	n	%
Male	25	49	26	51
Female	112	50.2	111	49.8
Age (years)	38.75 ± 7.7		38.34 ± 7.76	
BMI-1st Categorical				
Obesity class I (30.00-34.99)	69	50.4	68	49.6
Obesity class II (35.00-39.99)	46	50.5	45	49.5
Obesity class III (≥ 40.00)	22	47.8	24	52.2
BMI-2nd categorical				
Overweight (25.00-29,99)	31	32.6	64	67.4
Obesity class I (30.00-34.99)	62	55.9	49	44.1
Obesity class II (35.00-39.99)	34	58.6	24	41.4
Obesity class III (≥ 40.00)	10	100	-	-
Marital status				
Single/divorced	15	48.4	16	51.6
Married	122	50	121	49.8
Education level				
Illiterate	9	42.9	12	57.1
Primary school	50	47.6	55	52.4
Secondary school	55	52.4	50	47.6
University and	23	53.5	20	46.5
Total	137	100	137	100

Table 2: Intervention package and thematic areas for the cardinal study.						
Difference	**No L (n=137)**	**L 3.0 mg**	**No L**	**L 3.0 mg (n=137)**	**Between group**	
Variable	**Baseline mean ± SD**	**Baseline mean ± SD**	**Baseline mean ± SD**	**Baseline mean ± SD**	**95% CI**	**p-value**
Weight (kg)	102.56 ± 10.49	103.23 ± 10.71	96.73 ± 10.31	87.06 ± 10.42	-0.38-0.19	<0.001
BMI (kg/m^2)	36.62 ± 3.70	36.69 ± 3.84	33.35 ± 4.24	30.92 ± 3.57	-0.65-0.26	<0.001
SF-36:						
Physical f.	10.32 ± 9.33	34.52 ± 17.29	16.97 ± 12.43	70.43 ± 15.80	-13.0-11.0	<0.001
Role physical	10.21 ± 13.40	21.16 ± 20.98	27.18 ± 13.71	64.59 ± 19.56	-33.9-25.6	<0.001
Bodily pain	10.65 ± 12.38	20.05 ± 19.44	26.98 ± 14.69	62.64 ± 28.05	-30.3-9.2	<0.001
General health	8.01 ± 12.18	30.07 ± 25.52	22.81 ± 19.20	72.84 ± 17.75	-17.3-26.8	<0.001
Vitality	12.59 ± 12.94	24.45 ± 17.87	27.77 ± 15.68	74.05 ± 11.67	- 8.1-15.2	<0.001
Social f.	14.14 ± 15.06	28.55 ± 21.80	29.28 ± 14.80	74.45 ± 17.92	- 18.5-9.5	<0.001
Role emotional	17.50 ± 17.63	23.33 ± 20.73	35.00 ± 15.81	73.43 ± 21.83	- 24.6-11.0	0.013
Mental health	12.05 ± 11.62	24.64 ± 21.66	23.79 ± 15.94	73.34 ± 17.35	-45.8-53.0	<0.001

Discussion

This article is a study examining the effects of liraglutide, used in the treatment of obesity, on quality of life. The findings of this study indicate that the use of 3.0 mg liraglutide resulted in significant weight loss in obese patients and was associated with an improvement in quality of life.

The current findings also indicate the potential benefits of combining IBT with liraglutide 3.0 mg/day for weight loss and enhancements in QoL. Both groups treated with liraglutide experienced a loss of ≥11.5% of their initial weight after 1 year and were 2.4 times more likely to achieve clinically meaningful improvements in overall weight-related QoL compared to participants treated with IBT alone. Additionally, liraglutide-treated participants showed significantly greater increases in SF-36 MCS scores compared to those treated with IBT alone. These results support previous findings that liraglutide, when compared to placebo (both in conjunction with lifestyle counseling), enhances both HRQoL and weight-related QoL [11,12].

Only a small number of studies have investigated the effects of weight loss on Quality of Life (QoL) and depression in women with PCOS. Consistent with this research, women with PCOS who were randomly assigned to one of three 20-week lifestyle programs all experienced weight loss and saw an improvement in their QoL [13]. A similar outcome was observed in overweight and obese women with PCOS who were randomly assigned to either a low-carbohydrate or a traditional diet for 12 months, resulting in a 4% weight loss and a significant enhancement in QoL [14]. Furthermore, in overweight women with PCOS, a comparison between a low-protein high-carbohydrate diet and a high-protein low-carbohydrate diet showed similar weight loss effects, but only the high-protein diet group demonstrated an improvement in their depression scores [15].

A recent systematic review investigating the effects of weight fluctuations on the quality of life among overweight/obese adults in the USA revealed that enhancements in physical Health-Related Quality of Life (HRQoL) were statistically more significant than those in mental HRQoL [16]. The improvement in quality of life observed in Kahal's study may theoretically be associated with liraglutide treatment, especially considering the absence of a placebo group in the study, particularly in relation to the weight loss achieved [17]. The presented study demonstrates that the use of 3.0 mg liraglutide resulted in positive improvements in quality of life and also led to positive weight reduction after 8 weeks.

Conclusion

An eight week treatment with liraglutide resulted in significant weight loss and improvement in quality of life in participants with obesity. We believe that the inclusion of disease-specific and general quality of life measures in clinical trials related to weight loss in obesity could be beneficial.

Study strengths

In our study, we used a validated questionnaire to assess the quality of life of obese participants. Another strength of our study is the presence of a control group aiming to achieve similar weight loss.

Study limitations

Our study was conducted within an eight-week timeframe due to the medication not being reimbursed by the government and being costly. Conducting the study over a longer period and with a larger sample group would lead to more reliable results.

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