Study identifies 3 strategies to minimize muscle loss from GLP-1 weight loss drugs

Research is looking for ways to minimize muscle loss from GLP-1 drugs taken to treat obesity. Iuliia Burmistrova/Getty Images

- GLP-1 drugs have helped people successfully achieve and maintain weight loss; however, losing muscle has been a significant concern.
- New research suggests that weight loss treatments using GLP-1 and dual GLP-1/GIP receptor agonists can lead to significant fat loss while still maintaining lean muscle mass.
- The study found that strength training and enough protein were key to keeping muscle while losing weight, as well as getting guidance from an obesity medicine specialist.

New research to be presented at the European Congress on Obesity (ECO 2025) suggests that weight loss treatments using GLP-1 and dual GLP-1/GIP receptor agonists can lead to significant fat loss with minimal reduction in lean muscle mass.

A six-month study of 200 adults with overweight or obesity found that supervised care, strength training, and enough protein are key to keeping muscle while losing weight.

The research, carried out by obesity experts in New York, adds to the growing evidence that these medications can help people manage obesity effectively.

What are GLP-1 receptor agonists?

GLP-1 (glucagon-like peptide-1) receptor agonists, such as semaglutide and liraglutide, were originally developed to treat type 2 diabetes but have also shown strong effectiveness in managing obesity and supporting weight loss.

GLP-1 is a type of incretin, a gut hormone that plays a role in regulating blood sugar levels.

GLP-1 agonists are medications that mimic or boost the effects of this natural hormone. These drugs work in several ways, including:

- Encouraging insulin release from the pancreas in response to food.
- Reducing the release of glucagon, a hormone that increases blood sugar.
- Slowing the rate at which the stomach empties.
- Suppressing appetite and lowering food intake by promoting a feeling of fullness.

GLP-1 agonists may also directly influence the brain's hunger centers. Because they curb appetite, they can also support weight loss.

More recently, tirzepatide, which targets both GLP-1 and GIP (glucose-dependent insulinotropic polypeptide) receptors, has received approval for treating type 2 diabetes and/or obesity.

Tracking body composition while on GLP-1 agonists

As evidence continues to grow in favor of these therapies, closely tracking body composition (especially muscle mass and potential muscle loss) remains important.

Specialists in obesity medicine play a crucial role in creating treatment strategies that help patients lose weight while maintaining lean muscle mass.

In this six-month prospective cohort study, 200 adults ages 18 to 65 with a BMI of 25 kg/m² or higher (classified as overweight or obese) were enrolled and prescribed either the GLP-1 receptor agonist semaglutide or the dual GLP-1/GIP agonist tirzepatide.

Of the participants, 60% (n = 120) were treated with tirzepatide and 40% (n = 80) with semaglutide.

All participants received guidance from a board certified obesity physician on proper medication use, resistance training, and adequate protein intake.

Body composition was measured at the start of the study, at three months, and again at six months, using the InBody 570, a professional-grade analyzer that utilizes multi-frequency bioelectrical impedance analysis (BIA).

This system gives a full picture of body makeup, measuring things like body water (inside and outside cells), muscle mass, body fat percentage, belly fat, and how muscle is spread across the body.

The main focus was on how fat and muscle levels changed, using statistics to analyze the results.

Researchers also collected information on how well people stuck to their medication, how active they were, and what they ate.

Each person's results before and after the study were compared to see the effects and all 200 participants (99 men and 101 women) completed the full duration of the study.

Significant weight and fat loss with minimal muscle reduction

The average age was 47, with a mean starting BMI of 31.4 kg/m²—indicating that all participants were classified as overweight or obese (BMI ≥25).

After six months, women reduced their average body weight from 156 pounds (71 kg) to 137 pounds (62 kg), reflecting a 12% weight loss.

Men saw their average weight drop from 223 pounds (101 kg) to 193 pounds (88 kg), a 13% reduction.

In terms of body composition, women lost an average of 10.8 kg of fat mass while only losing 1.4 pounds (0.63 kg) of muscle.

Men experienced a fat mass reduction of 25 pounds (12 kg), with a minimal muscle loss of just 2.4 pounds (1 kg).

People in the study said they took their medication as prescribed 95% of the time after three months and 89% of the time after six months.

Interviews and other feedback showed that those who regularly did strength training and ate enough protein were more likely to keep their muscle and strength.

The study is still ongoing and more data is being collected.

Comparing participants on tirzepatide vs. semaglutide

Analysis is ongoing to compare differences in weight loss, lean mass, and fat mass reduction between those using tirzepatide and those using semaglutide.

The researchers explained that their six-month study provides evidence that both GLP-1 and dual GLP-1/GIP receptor agonists are effective in reducing overall weight and body fat in people living with obesity.

While it's normal to lose some muscle during weight loss, the study found that this can be reduced when treatment is guided by an obesity specialist.

The researchers pointed out that sticking to the medication, eating enough protein, and having regular check-ups seemed to lead to better results.

Their data showed that the medications help reduce body fat while keeping muscle.

However, they stressed that more research is needed to understand how diet and exercise help maintain muscle during weight loss.

How to minimize muscle loss while taking GLP-1 drugs

Co-author of the research, Alexandra Filingeri DCN, RCN, explained the key findings to Medical News Today:

"This study measured body composition—specifically body fat mass (in pounds), muscle mass (in pounds), and total body weight (in pounds)—in patients at baseline, 3 months, and 6 months while taking GLP/GIP weight loss medications. The results suggest that, with proper supervision, a protein-rich diet, regular resistance training, and guidance from a trained medical provider, patients can decrease fat mass while minimizing muscle loss."

Mir Ali, MD, board certified general surgeon, bariatric surgeon and medical director of MemorialCare Surgical Weight Loss Center at Orange Coast Medical Center in Fountain Valley, CA, not involved in this research, said that "this study was helpful to show that some muscle can occur with significant weight loss."

"We see this in our surgical weight loss patients as well, and try to emphasize methods to minimize muscle loss," he told MNT.

Ali highlighted that "when patients are taking these weight loss medications, they should also implement measures to reduce muscle loss. Muscle loss can lead to weakness and other problems."

"The main things patients can do is ensure adequate protein intake and exercise. Resistance-type exercises are helpful in maintaining and possibly even building muscle," Ali said.

Filingeri noted that this research study was "designed to further examine changes in weight, body fat mass, and muscle mass in patients taking incretin medications."

"We found that, under close supervision and regular follow-up from an obesity medicine specialist, patients were able to lose fat mass with only a minimal decline in muscle mass."

— Alexandra Filingeri, DCN, RCN

Filingeri pointed out that the results of this study cannot be generalized to patients receiving medication via telemedicine without routine body composition analysis, nor can they be generalized to in-person visits without utilizing body composition analysis.

“Further research should explore the roles that diet and exercise play in the success of these medications,” she added.

News Source:

https://www.medicalnewstoday.com/articles/study-3-strategies-minimize-muscle-loss-glp-1-weight-loss-drugs#How-to-minimize-muscle-loss-while-taking-GLP-1-drugs