

Original Research

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A Study on the Effect of Different Concentrations of GLP-I as a Treatment for Obese Iraqi Heart Patients

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ABSTRACT: The study included 43 obese patients with documented signs of heart failure, as evidenced by their medical reports. The patients, aged over 50 years and weighing average (109 kg) kg and length average (168 cm) , were divided into three groups: A (14) ,B (13) and (C16). They were administered three different concentrations of glucagon GLP-1: 0.1, 0.2, and 0.3 mg/ml. The treatment lasted 90 days, and the results showed significant and varying weight loss across all three groups weights and The starting BMI measurement for all groups was 28.49 3. The 0.3 mg/ml concentration resulted in the greatest weight loss, highlighting its therapeutic potential as a metabolic inhibitor and appetite suppressant.

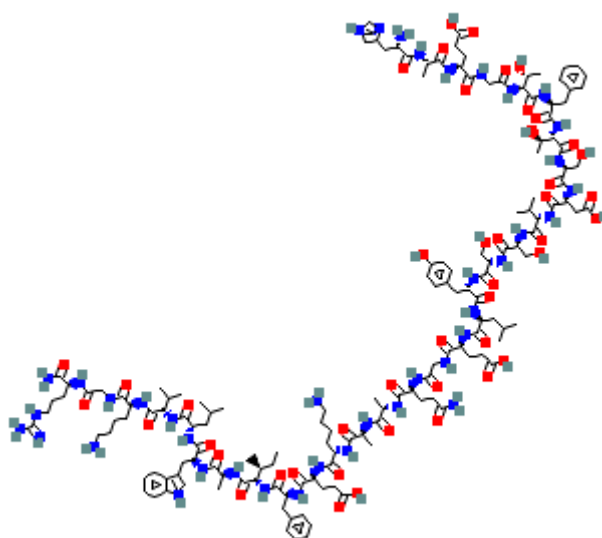


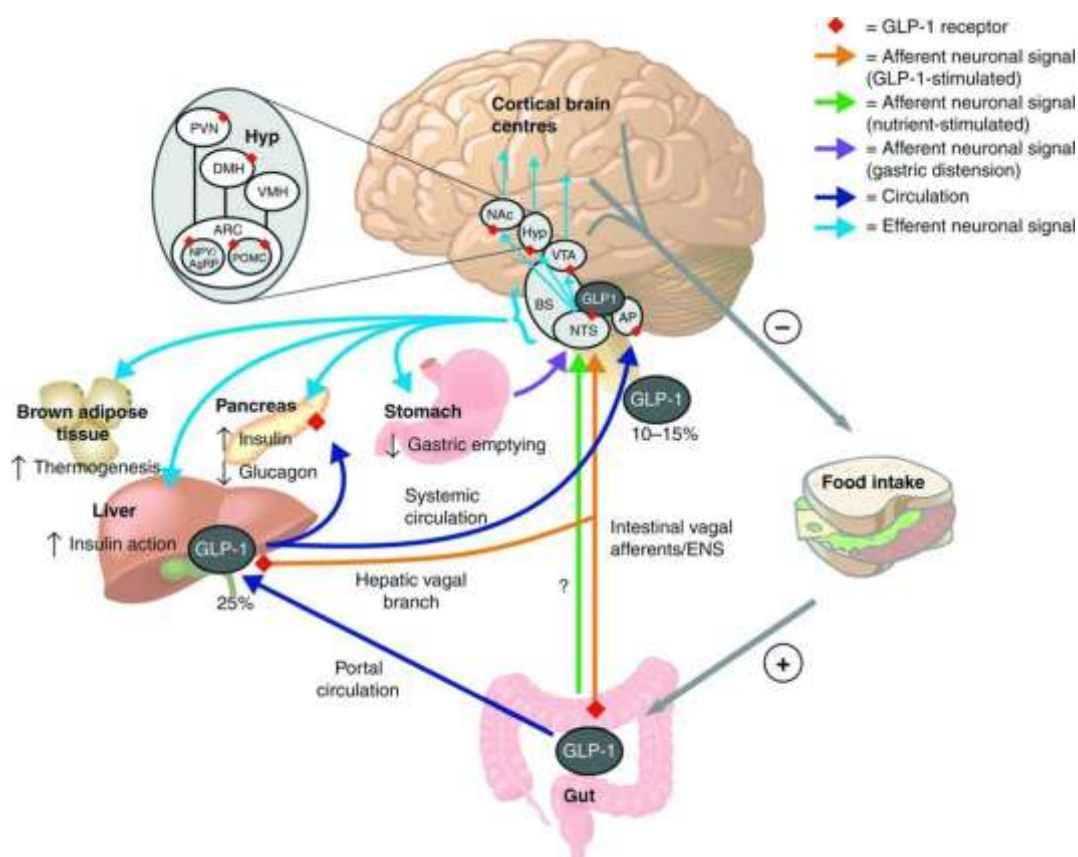
Figure (1) GLP-1 Molecular Formula $C_{149}H_{226}N_{40}O_{45}$

2-BACKGROUND

Insulin is a protein responsible for lowering blood sugar levels. Its absence leads to the storage of sugar in the liver, muscles, and cells, thus contributing to weight gain. The development of glucagon-like peptide-1 (LNP-1) agonists for adults is not universally applicable, except in cases where they are prescribed to healthcare professionals⁽²⁾. This is done after careful consideration of the individual's health history and various indications. Based on strict WHO recommendations, these various

vitamins can be a beneficial and healthy option for individuals with obesity ($\text{BMI} \geq 30$). These alternatives do not include the use of glucagon-like peptide-1 agonists in pregnant women, as these medications have not yet been tested in this population.⁽³⁾

These regimens are effective for weight loss, with most individuals experiencing at least a 5% reduction in weight. However, for optimal results, these regimens should be combined with a control intervention, including healthy behavioural changes and exercise.⁽⁴⁾



⁽⁵⁾Figure (2) GLP-1 and its role in body metabolism

GLP-1 receptor agonists, also known as GARAs1, were first made to help people with type 2 diabetes manage their blood sugar. However, recent research has found they also help the heart. Studies like STEP-HFpEF and SUMMIT have shown that these drugs can improve symptoms and help people lose weight in those with heart failure, especially when their heart's pumping ability is normal (HFpEF). These medications work through several important body processes that are connected to how the heart functions. These processes include how the nervous system responds, how the body handles inflammation, how it deals with harmful free radicals, how it manages calcium, how it uses Natriuretic peptides, and how it uses energy in the heart.⁽⁶⁾

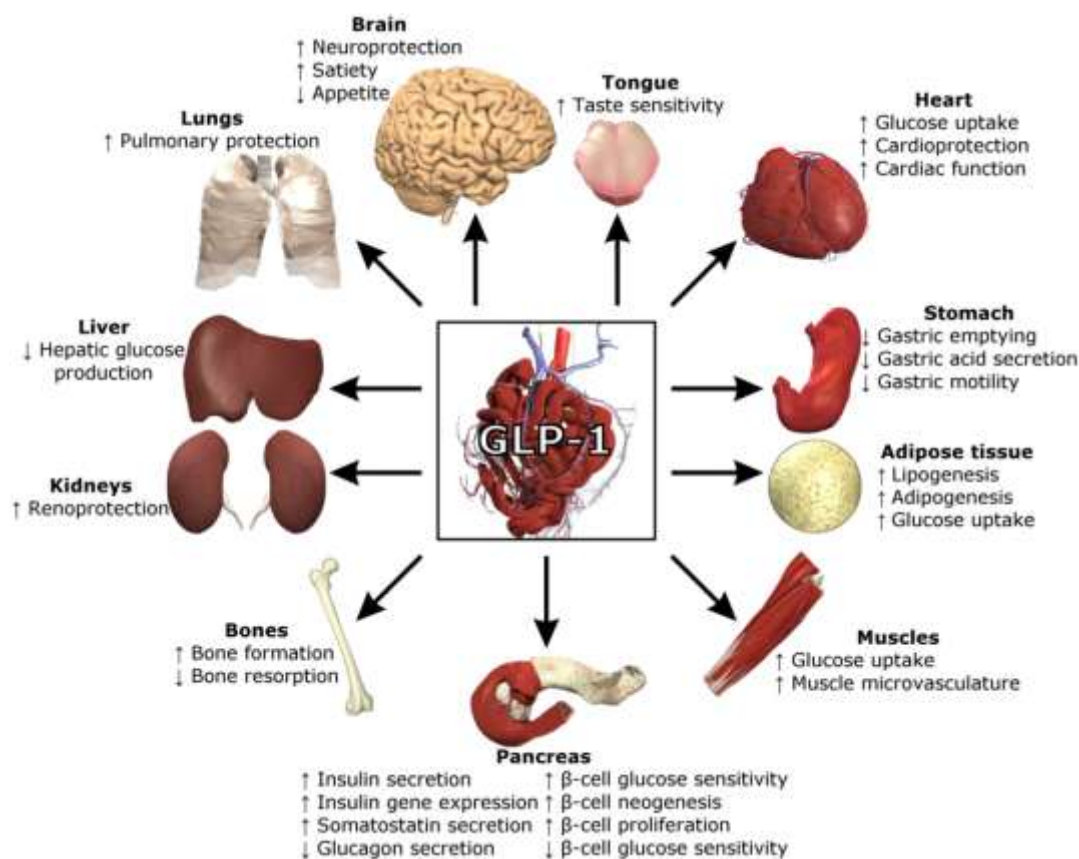
3-THE AIM OF THE STUDY

To determine the readings from MBI to understand the effect of different doses and to mitigate the impact on patients with multiple chronic diseases in order to prevent deterioration of their health.

4-INTRODUCTION

4-1-stimulation

Glucagon-like peptide-1 (GLP-1) receptor agonists stimulate insulin secretion when blood glucose levels rise and decrease glucagon secretion, thus helping to lower blood glucose levels. These medications slow down the digestion of food and promote feelings of fullness, leading to reduced food intake. Commonly approved GLP-1 medications for weight loss, diabetes, and heart disease may have untapped potential to reduce the risk of substance use disorders, psychosis, inflammation, certain cancers, and dementia. Significant and potentially underestimated risks associated with these medications primarily affect the digestive system and include: Nausea, Vomiting, Stomach pain, Heartburn, and gastroenteritis. In addition to bowel problems, those taking GLP-1 medications were more likely to develop bone and joint problems, such as arthritis and tendinitis, compared to people taking other medications to manage their blood sugar. ⁽⁷⁾



⁽⁸⁾Figure (3) Functions of GLP-1

The physiological actions of glucagon-like peptide-1 (GLP-1)

4-2-- Mechanism

GLP-1 receptor agonists change how blood vessels work by influencing nitric oxide signals, how the lining of blood vessels functions, and how the kidneys manage sodium. These changes help improve how blood flows and keep the body's balance of hormones and nerves working properly. Each effects connect with important processes in the body that are linked to the development of chronic heart failure, That's looks at how GLP-1 receptor signalling interacts with the causes and effects of heart failure.⁽⁹⁾

The interaction shows that these drugs may be useful as extra treatments for heart failure, especially in cases caused by problems with metabolism. Although exactly how these drugs affect the heart is not fully understood, their benefits at the body level, like improving metabolism and reducing inflammation, explain why they help in real-world situations.⁽¹⁰⁾

4-3- Heart attack predictions

Around 6.7 million people in the US who are 20 years old or older have heart failure, and this number is expected to almost double by 2050 ⁽¹¹⁾. The European Society of Cardiology defines heart failure as a condition that comes from issues with the structure or function of the heart, and it is shown by signs or symptoms like fluid build-up in the lungs or body, and/or high levels of natriuretic peptides.⁽¹²⁾

4-4- Obesity

Obesity is defined as a body mass index (BMI) ≥ 30 kg/m² and is a major contributing factor to heart failure ⁽¹³⁾. The Framingham Heart Study played a pivotal role in assessing the impact of obesity on heart failure.

This study, which included 5,881 participants, recorded a 1-unit increase in BMI, with a 5% increase in the incidence of heart failure in men and a 7% increase in women. ⁽¹⁴⁾ These findings have been confirmed in subsequent research. However, patients with obesity and heart failure are at increased risk of hemodynamics disorders, leading to a decline in their overall health and quality of life ⁽¹⁵⁾.

Because obesity and heart failure are connected, many people have worked hard to find better ways to treat them. These efforts include changing lifestyle habits and using medicines. Researchers have studied how medicines can help with heart failure symptoms and make it easier for people to do daily activities. One type of medicine, called GLP-1 receptor agonists, has made a big difference in treating heart failure.⁽¹⁶⁾

5-TREATMENT

5-1- Alternative treatment for diabetes

Researchers found that people taking GLP-1 medications were less likely to experience %42 different health outcomes and more likely to experience %19. The biggest improvements were seen in avoiding serious problems like shock, pneumonia, liver failure, lung failure, and heart stoppage. While the researchers found more benefits than risks associated with GLP-1 medications, they cautioned that this should not be seen as an unconditional green light.

It's difficult to make a blanket recommendation because the side effects are real, and people should discuss this with their doctor or healthcare provider and weigh the individual risks and benefits of each.

The World Health Organization has created new rules about using a type of weight-loss medicine called GLP-1 inhibitors. This is a major change in how global health is managed, especially since more people are becoming obese.

The **WHO** recommends the use of these drugs under specific conditions as part of a long-term treatment plan for the condition, which the organization says affects more than one billion people worldwide. These guidelines come amid a surge in demand for drugs known as glucagon-like peptide-1 (GLP-1) inhibitors, such as Wegovy, Ozempic, and Mounjaro.

The UN agency said that over one billion people around the world are obese, and this is connected to about 3.7 million deaths in 2024. It also warned that if we don't take stronger steps, the number of people with obesity could almost double by 2030. This would put a lot of stress on healthcare systems and cause problems. Global economic losses of up to 3 trillion dollars each year. The World Health Organization supports the use of GLP-1 for obesity treatment.



⁽¹⁷⁾Figure (4) GLP-1 and diabetes

6-TESTING METHOD

GLP-1 hormone mimetic are injected subcutaneously using pre-filled pens once a week, usually in the abdomen, thigh, or upper arm. It is essential to keep the skin sterile, rotate the injection site regularly, and avoid direct intramuscular injections. Basic injection steps: Preparation: Wash your hands thoroughly and check the pen's expiration date and the liquid inside to ensure it is clear and free of lumps. Needle insertion: Remove the pen cap and securely attach a new, sterile needle according to your pen's instructions. Site selection: Clean the chosen skin area (abdomen, thigh, or arm) with an alcohol swab and allow it to dry. Injection: Gently grasp a fold of skin, insert the needle at a 90-degree angle (or 45 degrees for slender skin), and press the injection button all the way through. Waiting: Hold the needle under the skin for 6 to 10 seconds to ensure the entire dose is injected. Safe disposal: Withdraw the needle, carefully replace the outer cap, and dispose of it in a sharps container.

7- IMPORTANT SAFETY TIPS:

Rotate site, Avoid injecting in the exact same spot every time to prevent skin irritation, Ensure the injection is administered into the subcutaneous fat layer, not into the muscle.

8- RECORDING RESULTS

1-The three groups are checked weekly, with weight differences recorded monthly with each dose of GLP.

9- DISCUSSION OF RESULTS

Based on the recorded results, the data were plotted for accurate confirmation. The differences illustrated the extent of the dose effect over the study periods. Figure 5 shows that the 0.1 dose for the first group resulted in a decrease in PMI per month. Figure 6 shows a decrease in PMI per month with a greater effect of the 0.2 dose. Figure 7 shows the greater effect of the dose compared to the first and second groups in the study. Finally, Figure 8 summarizes all groups and the effect of the different doses over a 3-month period

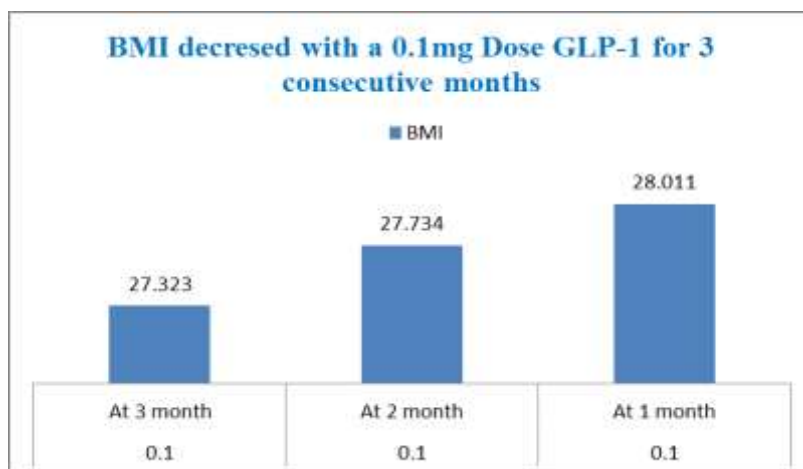


Figure (5) illustrates the effect of a 0.1 mg GLP-1 dose for three months on BMI reduction.

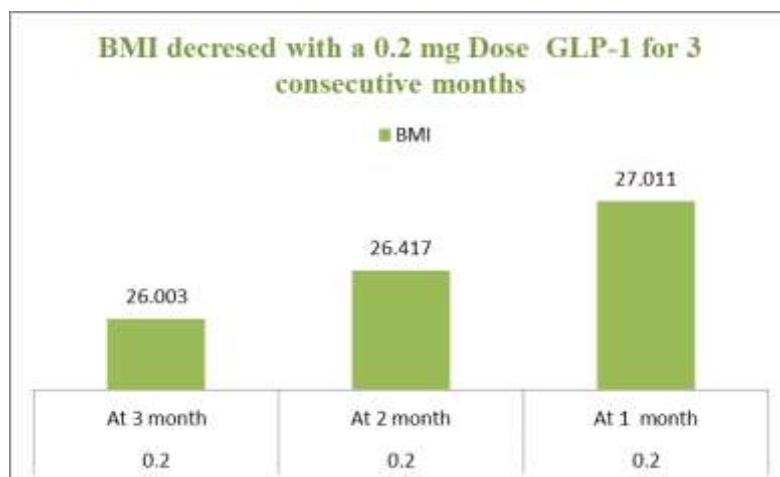


Figure (6) illustrates the effect of a 0.2 mg GLP-1 dose for three months on BMI reduction.

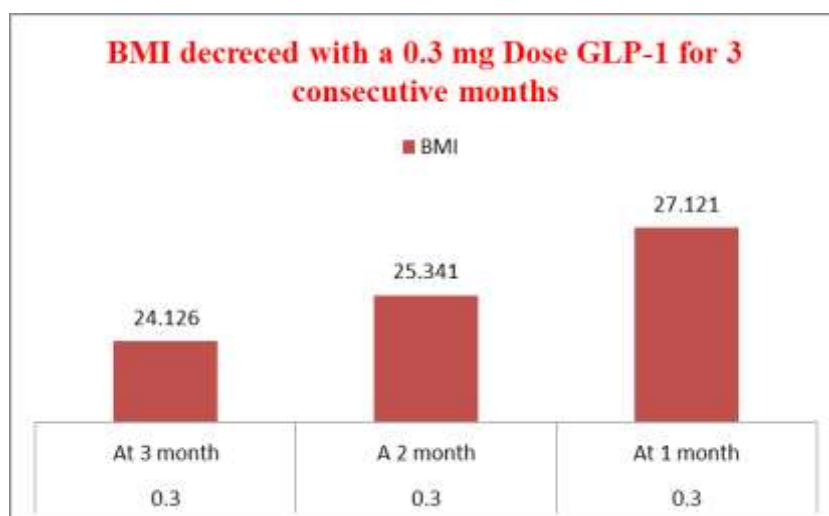
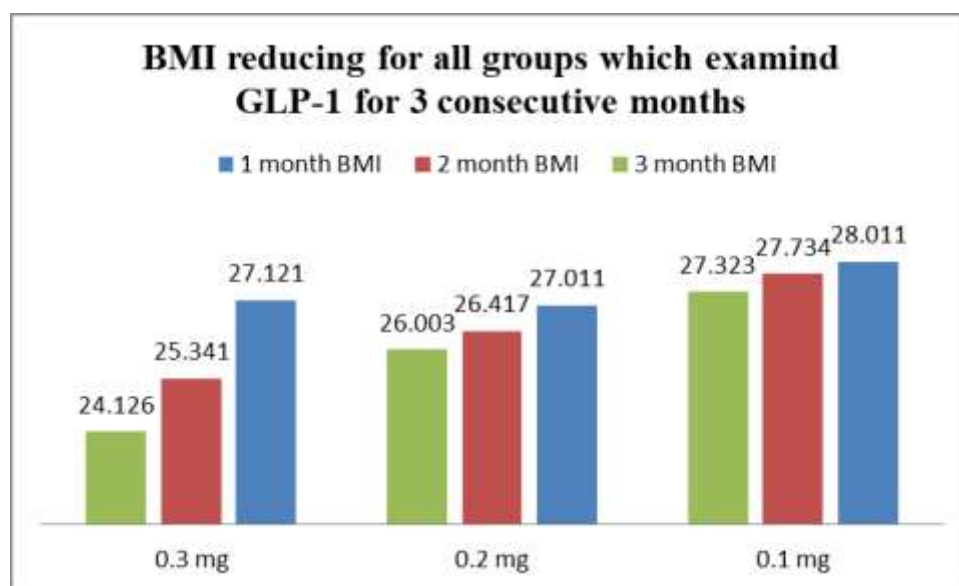


Figure (7) illustrates the effect of a 0.3 mg GLP-1 dose for three months on BMI reduction.



Figure(8) summarizes all groups and the effect of the different doses over three .month period

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