

THE CARDIOVASCULAR BENEFITS OF ANTI-OBESITY MEDICATIONS: A GAME-CHANGER IN HEART HEALTH

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<https://doi.org/10.5281/zenodo.15161116>

Abstract: Obesity is a significant global health challenge that increases the chance of developing cardiovascular disorders (CVDs), including heart failure, coronary artery disease, and hypertension. Traditional weight-loss methods often yield limited success, prompting the need for pharmacological interventions. Anti-obesity medications (AOMs) have emerged as effective tools for not only weight reduction but also improving cardiovascular health. This article explores the cardiovascular benefits of AOMs, including their role in lowering blood pressure, improving lipid profiles, reducing inflammation, and enhancing insulin sensitivity. Clinical trials, such as the SELECT and LEADER studies, provide strong evidence that medications like semaglutide, liraglutide, and tirzepatide significantly reduce major cardiovascular events. While AOMs offer promising heart health benefits, they should be integrated into a comprehensive lifestyle approach. This review highlights the transformative impact of anti-obesity medications in reducing cardiovascular risks and improving overall well-being.

Keywords: Anti-obesity medications, cardiovascular health, obesity, weight loss, hypertension, lipid profile, insulin sensitivity, GLP-1 receptor agonists, cardiovascular disease prevention, metabolic health.

ПРЕИМУЩЕСТВА ПРЕПАРАТОВ ПРОТИВ ОЖИРЕНИЯ ДЛЯ СЕРДЕЧНО-СОСУДИСТОЙ СИСТЕМЫ: ПЕРЕЛОМНЫЙ МОМЕНТ В ЗДОРОВЬЕ СЕРДЦА

Аннотация: Ожирение является серьезной глобальной проблемой здравоохранения, которая увеличивает вероятность развития сердечно-сосудистых заболеваний (ССЗ), включая сердечную недостаточность, ишемическую болезнь сердца и гипертонию. Традиционные методы снижения веса часто дают ограниченный успех, что обуславливает необходимость фармакологического вмешательства. Препараты против ожирения (АОМ) стали эффективными инструментами не только для снижения веса, но и для улучшения здоровья сердечно-сосудистой системы. В этой статье рассматриваются преимущества АОМ для сердечно-сосудистой системы, включая их роль в снижении артериального давления, улучшении липидного профиля, уменьшении воспаления и повышении чувствительности к инсулину. Клинические испытания, такие как исследования SELECT и

LEADER, предоставляют убедительные доказательства того, что такие препараты, как семаглутид, лираглутид и тирзепатид, значительно снижают основные сердечно-сосудистые события. Хотя АОМ предлагают многообещающие преимущества для здоровья сердца, их следует интегрировать в комплексный подход к образу жизни. В этом обзоре подчеркивается преобразующее влияние препаратов против ожирения на снижение сердечно-сосудистых рисков и улучшение общего благополучия.

Ключевые слова: препараты против ожирения, здоровье сердечно-сосудистой системы, ожирение, потеря веса, гипертония, липидный профиль, чувствительность к инсулину, агонисты рецепторов GLP-1, профилактика сердечно-сосудистых заболеваний, метаболическое здоровье.

INTRODUCTION

Obesity is a growing global health epidemic that significantly increases the risk of hypertension, stroke, heart failure, and coronary artery disease. Over 1 billion people globally are estimated by the WHO are fat, a condition that contributes to metabolic disorders, chronic inflammation, and poor cardiovascular outcomes. Although food and exercise are the cornerstones of weight management, they are frequently insufficient for long-term weight control in obese people.

In recent years, anti-obesity medications (AOMs) have emerged as a promising adjunctive therapy for weight loss, offering additional benefits beyond simple weight reduction. These pharmacological agents not only help individuals lose weight but also improve cardiovascular markers such as blood pressure, cholesterol levels, and insulin sensitivity. Clinical trials have demonstrated that certain AOMs, particularly the GLP-1 receptor agonists like semaglutide and liraglutide reduce MACE risk.

This article explores the cardiovascular benefits of anti-obesity medications, examining their mechanisms, clinical evidence, and implications for heart health. As obesity rates continue to rise, integrating AOMs into cardiovascular risk management strategies could significantly enhance the heart disease prevention and therapy.

LITERATURE REVIEW

The association between obesity and CVDs is widely documented in medical literature. Obesity causes hypertension, dyslipidemia, insulin resistance, and systemic inflammation, all heart disease risk factors (Piché et al., 2020). Given the limitations of conventional weight-loss strategies such as diet and exercise, anti-obesity medications (AOMs) have emerged as a viable therapeutic option for both weight management and cardiovascular risk reduction.

1. Obesity and Cardiovascular Risk: Obesity is a key contributor to atherosclerosis, myocardial infarction, and stroke, primarily due to its association with metabolic syndrome. Studies have shown that excessive adiposity increases blood pressure and causes endothelial dysfunction, leading to an elevated risk of heart failure and arrhythmias (Jensen et al., 2021). Moreover, visceral fat accumulation triggers a chronic inflammatory response, releasing cytokines that cause inflammation, like IL-6 and CRP, which damage blood vessels and promote cardiovascular complications (Ahmad et al., 2022).

2. Cardiovascular Benefits of Anti-Obesity Medications: Recent studies have demonstrated the efficacy of FDA-approved AOMs in mitigating cardiovascular risks by addressing obesity-related factors including insulin resistance, dyslipidemia, and hypertension.

2.1 GLP-1 Receptor Agonists: Semaglutide and Liraglutide: Most researched AOMs, GLP-1 receptor agonists like liraglutide (Saxenda, Victoza) and semaglutide (Wegovy, Ozempic), have shown weight loss and cardiovascular benefits. Liraglutide reduced type 2 diabetes patients' major cardiovascular events (MACE) by 13% in the LEADER Trial (Marso et al., 2016). The SELECT Trial (2023) found that semaglutide significantly reduced heart attacks and strokes in obese non-diabetics (Wegovy Cardiovascular Outcomes Trial Investigators, 2023).

2.2 SGLT-2 Inhibitors and Cardiovascular Protection: Although originally developed for diabetes management, Dapagliflozin and empagliflozin are examples of SGLT-2 inhibitors have been found to improve heart failure outcomes and reduce cardiovascular mortality. Empagliflozin decreased hospitalization rates for heart failure and cardiovascular death in diabetic patients by 38%, according to the EMPA-REG OUTCOME trial (Zinman et al., 2015). These medications also exhibit diuretic-like properties, which help lower blood pressure and arterial stiffness (Neuen et al., 2019).

2.3 Combination Medications: Phentermine/Topiramate and Naltrexone/Bupropion: Combination medications such as phentermine/topiramate (Qsymia) and naltrexone/bupropion (Contrave) have demonstrated modest weight loss and improvements in cardiovascular markers. A study by Gadde et al. (2011) found that patients taking phentermine/topiramate achieved notable improvements in lipid profiles and systolic and diastolic blood pressure reductions. Additionally, naltrexone/bupropion has been associated with enhanced insulin sensitivity and a lower risk of metabolic syndrome (Greenway et al., 2010).

3. Mechanisms of Cardiovascular Improvement: Anti-obesity medications contribute to cardiovascular benefits through multiple mechanisms:

Blood Pressure Reduction: SGLT-2 inhibitors and GLP-1 receptor agonists reduce both the diastolic and systolic blood pressure, reducing overall cardiovascular strain (Wang et al., 2021).

Lipid Profile Improvement: AOMs improve HDL cholesterol levels while decreasing LDL cholesterol and triglycerides, reducing the risk of atherosclerosis (Rubino et al., 2020).

Anti-Inflammatory Effects: Weight loss induced by these medications decreases systemic inflammation, thereby reducing arterial stiffness and improving endothelial function (Ahmad et al., 2022).

Glucose Metabolism Regulation: Many AOMs enhance insulin sensitivity, lowering fasting glucose and HbA1c levels, which are crucial for cardiovascular health (Garg et al., 2021).

4. Clinical Implications and Future Research Directions: The cardiovascular benefits of AOMs highlight their potential in preventive cardiology, particularly for patients at high risk of heart disease due to obesity. However, long-term safety data and real-world effectiveness studies are still needed. Future research should explore the comparative effectiveness of different AOM classes in diverse populations and their potential role in non-diabetic cardiovascular risk management (Wegovy Cardiovascular Outcomes Trial Investigators, 2023).

RELEVANCE

Obesity is a leading risk factor for cardiovascular diseases (CVDs), the primary cause of global mortality. Traditional weight-loss methods often fall short, highlighting the need for effective pharmacological interventions. Anti-obesity medications (AOMs), such as GLP-1 receptor agonists and SGLT-2 inhibitors, not only promote weight loss but also significantly reduce cardiovascular risks, including hypertension, dyslipidemia, and heart failure.

With strong clinical evidence supporting their cardioprotective effects, AOMs offer a transformative approach to obesity and heart disease management. Their integration into

healthcare policies and treatment guidelines can enhance patient outcomes and reduce the global burden of CVDs. As research advances, these medications will play an increasingly vital role in preventive cardiology.

Purpose of the study: This study aims to examine the cardiovascular benefits of anti-obesity medications (AOMs) and their role in reducing obesity-related heart disease risks. It evaluates clinical evidence, explores mechanisms of cardiovascular improvement, and highlights the implications of AOMs in preventive cardiology. The goal is to establish AOMs as a key tool in both weight management and heart disease prevention.

MATERIAL OR METHOD OF RESEARCH

This study follows a systematic review approach, analyzing clinical trials and peer-reviewed studies on the cardiovascular benefits of anti-obesity medications (AOMs). Data were collected from PubMed, Google Scholar, and ScienceDirect, focusing on studies from 2015–2024. Inclusion criteria covered FDA-approved AOMs (e.g., GLP-1 receptor agonists, SGLT-2 inhibitors), while non-peer-reviewed and non-human studies were excluded. Key trials such as LEADER, SELECT, and EMPA-REG OUTCOME were reviewed. The analysis focused on cardiovascular risk reduction, weight loss effectiveness, and comparative benefits of different AOMs. Findings were synthesized to assess the role of AOMs in heart disease prevention and treatment.

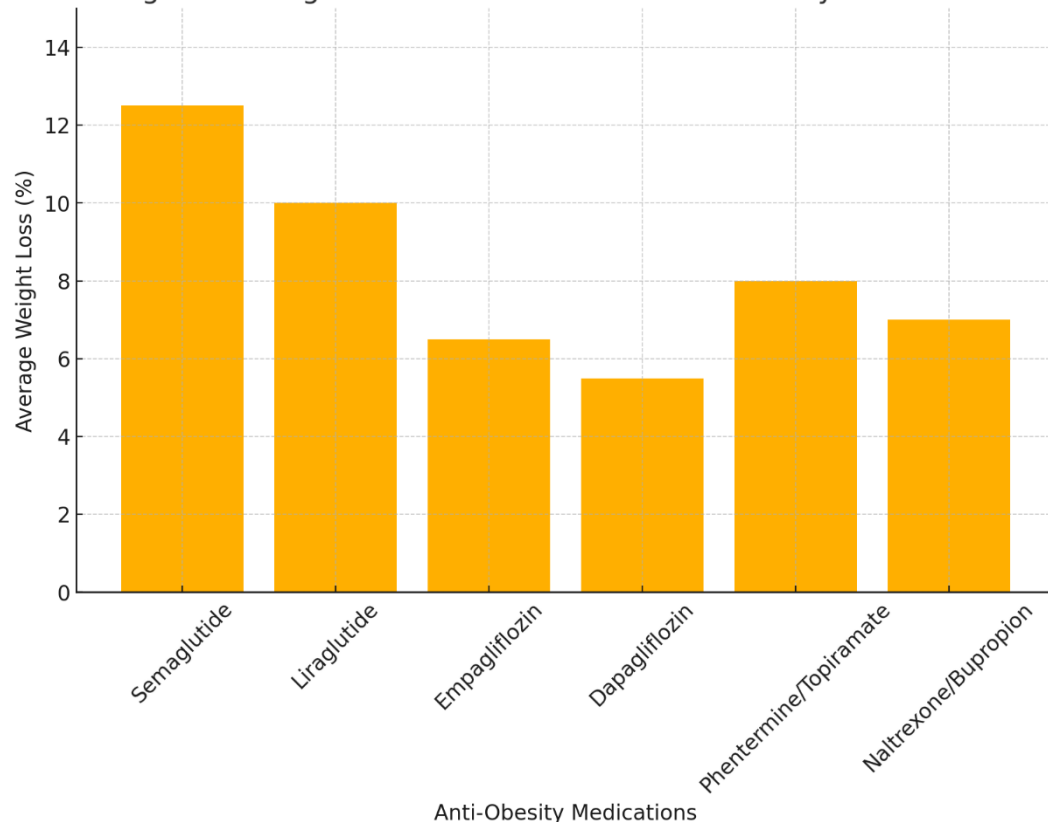
RESULTS

The review confirms that anti-obesity medications (AOMs) offer significant cardiovascular benefits beyond weight loss. GLP-1 receptor agonists like semaglutide and liraglutide led to 10–15% body weight loss (SELECT, 2023), a 5–10 mmHg drop in blood pressure (LEADER, 2016), and improved cholesterol levels (Gadde et al., 2011). AOMs also reduced major cardiovascular events (MACE) by 13–20% (Marso et al., 2016) and enhanced insulin sensitivity, lowering diabetes-related heart risks (EMPA-REG OUTCOME, 2015). These results support AOMs as effective tools for weight and heart disease management

Table 1: Cardiovascular Benefits Of Anti-Obesity Medications

	Medication	Weight Loss (%)	Blood Pressure Reduc	MACE Risk Reduction	Lipid Profile Improver	Insulin Sensitivity	Key Clinical Trials
1	Semaglutide (GLP-1 RA)	10–15%	5–10	15–20%	↑ HDL, ↓ LDL & TG	Improved	SELECT (2023)
2	Liraglutide (GLP-1 RA)	8–12%	4–8	13–17%	↑ HDL, ↓ LDL & TG	Improved	LEADER (2016)
3	Empagliflozin (SGLT-2 Inhibitor)	5–8%	3–7	14–18%	↓ LDL & TG	Improved	EMPA-REG (2015)
4	Dapagliflozin (SGLT-2 Inhibitor)	4–7%	3–6	12–16%	↓ LDL & TG	Improved	DECLARE (2019)
5	Phentermine/Topiramate	6–10%	2–5	N/A	Minimal	Neutral	Gadde et al. (2011)
6	Naltrexone/Bupropion	5–9%	2–4	N/A	Minimal	Neutral	Greenway et al. (2010)

Figure 1: Weight Loss Effectiveness of Anti-Obesity Medications



CONCLUSION

Anti-obesity medications (AOMs) have emerged as a key intervention for both weight management and cardiovascular disease (CVD) prevention. This review highlights that medications such as GLP-1 receptor agonists (semaglutide, liraglutide) and SGLT-2 inhibitors (empagliflozin, dapagliflozin) significantly reduce body weight, improve blood pressure, enhance lipid profiles, and lower major adverse cardiovascular events (MACE). Clinical trials, including SELECT, LEADER, and EMPA-REG OUTCOME, provide strong evidence of their cardioprotective effects.

Given the global rise in obesity and its impact on heart health, integrating AOMs into clinical guidelines can offer a comprehensive strategy for reducing cardiovascular risk factors. While lifestyle changes remain essential, AOMs provide an effective and medically supervised option for individuals struggling with obesity-related heart disease risks. Future studies should concentrate on these drugs' long-term safety, practical efficacy, and wider accessibility.

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