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A REVIEW OF OZEMPIC'S OFF LABEL USE FOR WEIGHT LOSS IN NON-DIABETIC INDIVIDUALS: CLINICAL EVIDENCE, SAFETY AND ETHICS

Tuba[1], Anum Sattar[*2], Sidra Javed[3], Mizna Masood[4], Zunaira Shaikh[5]

[1,*2,4,5]*Department of Pharmacy Practice, Faculty of Pharmacy and Pharmaceutical Sciences, Ziauddin University, Karachi, Pakistan.*

[3]*Department of Biochemical sciences, Faculty of Pharmacy and medicine, Sapienza University of Rome, Rome, Italy*

[*2]anum.sattar@zu.edu.pk/anumsattar2018@gmail.com

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Corresponding Author: *
Anum Sattar

Abstract

Ozempic a GLP-1 Receptor agonist is formulated to treat type 2 diabetes mellitus, recently became one of the most famous medicine for weight loss due to endorsement of celebrities and viral marketing trends on social media. Ozempic acts by mimicking GLP-1 thus helping to reduce blood glucose, increase insulin production and by having a feeling of fullness. This article reviews the off-label use of Ozempic among individuals without diabetes mellitus, summarising the clinical experience and practical application of Ozempic from publications made from 2020 to 2026. Ozempic's effectiveness in reality proven by weight loss and HbA1C improvement, the social media craze around it has led to serious shortage issues for diabetic patients. The medication is faced with the occurrence of physical symptoms such as Ozempic face, depression and thyroid cancer. Ozempic has become the centre of debate within society as a shortcut solution for weight loss.

INTRODUCTION

Recent online conversations surrounding weight loss on social media platforms are mostly associated with Ozempic, which as initially authorized to be used to enhance metabolism among diabetics but results in weight loss. Ozempic belongs to GLP1 agonists class of drug such as Wegovy and Rybelsus, that contain semaglutide as the main ingredient. GLP-1 agonists act like GLP-1 hormone which is produced by the intestines and found naturally in the body to help regulate blood sugar levels and decrease appetite, when glucose levels are high it also increases the production of insulin and decrease production of glucagon also slow gastric emptying hence signals the brain feeling of fullness. The rising trend of using Ozempic on social media has led to an increase in its demand in consumers to an extent that there is an increase shortage of this medicine especially among patients requiring Ozempic in managing their diabetic

conditions[1]. In 2023 there had been more than 50 million prescriptions for GLP-1 issued and Ozempic comprised approximately 39% of it[2]. The growth in popularity for the cosmetic use of Ozempic is strongly fuelled by various social media platforms and celebrities' recommendations in all age groups[3]. From descriptive analysis of 100 TikTok videos that had Ozempic hashtag concluded that >50%of the videos involved the mention of individuals who had taken or intended to take Ozempic along with its effectiveness on weight loss[4]. Although Ozempic is effective in weight loss, Ozempic in known to cause variety of adverse effects. The most commonly occurring are gastrointestinal symptoms (nausea, vomiting, constipation, diarrhoea)[5]. Accelerated increase of the prevalence of obesity to an age adjusted 42.4% among adults in the United States has heightened the interests in methods of limiting the increase in obesity[6].

Mechanism of Action

Semaglutide is a type of GLP-1 analogue with a sequence homology of 94% with human GLP-1 hormone. Semaglutide acts as a GLP-1 receptor agonist and acts by binding to and activating GLP-1 acts in various ways to regulate glucose through its receptors. Long duration of action and half life of semaglutide occur due to binding with albumin, leading to reduced renal clearance and resistance to degradation. Semaglutide is stable against DPP-4 enzyme mediated degradation. In relation to lowering blood glucose levels semaglutide promotes insulin secretion while reducing glucagon secretion depending on glucose levels. Insulin is secreted more while glucagon is less secreted when blood glucose levels increase. Glucose lowering action of semaglutide is also associated with a small delay in the rate of gastric emptying in the postprandial state[7].

Methodology

This review focusses on the off-label use of Ozempic for weight loss in non-diabetic individuals. The review is based on previously published scientific literature including clinical trials and observational studies. Relevant studies were identified through electronic databases like PubMed, Google Scholar and ScienceDirect. The literature search used keywords such as 'semaglutide' 'Ozempic', 'weight loss', 'off label use', 'safety'. Studies published in English between 2020 and 2026 were prioritized to ensure relevance to current practices and recent evidence. Studies were excluded if they were not in English, were in the form of an essay, case report or were opinion based without scientific data.

Interpretation of real-world vs clinical trial data

Following clinical study describes a nationwide UK audit that examines how effective injectable semaglutide is for patents with type 2 diabetes in real world situation. Researchers took the data from 620 participants over the period of 6 months to see how individual health factors effects blood sugar levels and body weight. The findings show that individuals with higher baseline HbA1C and those starting GLP1RA therapy had the most significant health improvements[8]. The table 1compares real life results obtained during the ABCD audit with the results from clinical trials focusing particularly on the study program concerning semaglutide effectiveness for patients with type 2 diabetes mellitus[8].

Table 1: Comparison of Baseline Characteristics, Glycemic and Weight Outcomes, and Predictors of Treatment Response Between the ABCD Real-World Audit and Clinical Trial Evidence

Feature	Real world data(ABCD audit)	Clinical trial evidence
Mean Baseline HbA1aC	81.6mmol/mol (9.2%)	67.2mmol/mol(7.4%)
Mean baseline weight	108.2 kg	90.6 kg
Diabetes Duration	11.2 years (median)	7.5 years (mean)
Average HbA1C Reduction	14.9mmol/mol	15mmol/mol

Average Weight Reduction	4.2kg	4.11kg
Predictor: Higher Baseline HbA1C/Weight	Associated with larger absolute reductions	Associated with larger absolute reductions
Predictor: GLP1RA naivety	GLP1RA naive patients had larger reductions	Associated with larger absolute reductions
Predictor: Diabetes duration	No significance difference in response based on duration	Shorter duration associated with better response in some trials
Predictor: age	Younger age (<60) predicted better HbA1C reduction	Not specifically highlighted in reference trials [8].

Prevalence of Ozempic injection misuse in the United States

The misuse of Ozempic (Semaglutide) injection without a prescription had been established to be a health problem among Americans as shown in Table 2. In research conducted in 2024, it was estimated that about 28,691 people ages 12 and above self admitted using Ozempic injection without a prescription[9].

Table 2: Overview of the misuse sample

Category	Findings
Gender	All participants were female (100%)
Age	Mostly 26-34 years old, followed by 18-25(29.3%) and 35-49(6.7%)
Body mass index (BMI)	88.5% were obesed,89% were normal weight, 2.6% were overweight
Race and ethnicity	Hispanic 44.5%, White 31.7%, 21.2% black, 2.6% Asian
Location	53.4% lived in small metropolitan areas, 46.6% in large metropolitan areas.
Substance use in past 12 months	*Alcohol 100% used, 53.4% met the criteria for an alcohol use disorder. *Tobacco/Nicotine: 57.5%smoked cigarettes and 53.4% vaped nicotine. *11.5% used cannabis *19.4% used non prescribed tranquilizers
Misuse patterns and needle acquisition	*91.2% had misused Ozempic within a year (6% in the last 30 days, 85.2% between 30 days and 12 months) *68% bought needle from pharmacy, 19.7% got them from drug dealer or they came with the drugs and 4.4% bought them online[9]

Ozempic Face

A term for the gaunt, hollowed facial appearance caused by sudden depletion of fat deposits. Key facial changes are volume loss (depletion of fat on the cheeks, temple and tear through areas), skin laxity (collagen reduction, wrinkles at the jawline, marionette lines, nasolabial folds), premature aging (person can age five years in looks). Rapid weight loss leads to deficiencies in protein, iron, vitamin B12.In order

to deal with the changes in volume and skin conditions aesthetic plastic surgeons follow techniques which includes dermal fillers and stimulators, autologous fat grafting, radio frequency microneedling and CO2 laser treatments to stimulate collagen and elastin regeneration. When non surgical treatments do not work surgical treatments becomes necessity such as deep plane or extended SMAS[10].

Evolution of food demand in post-Ozempic era

Ozempic, Wegovy and Zepbound have been reshaping how food is consumed. A study of food consumption behaviour of 505 Americans was conducted in April 2024 shows how GLP-1 drugs are altering the way people eat. The results concentrate mainly on variations in calorie intake, food preferences and money. Respondents decreased their caloric consumption by an average 700 kcal daily. The food items which were reportedly consumed less includes fried foods (68%), alcohol (65%) , sweets (56%) and carbohydrates (40%). The food participants consume more were vegetables (60%), fruits (50%), good fat (35%), protein (28%) and fish (29%). There was a reduction in the amount of money spent weekly for food purchase[11].

Ozempic versus traditional weight loss

Ozempic does not involve any effort of lifestyle transformation but rather acts as a shortcut for weight loss, it does not indicate any moral development such as self discipline and willpower. If people start considering Ozempic as an 'easy way out' they will perpetuate the stereotype about laziness and lack of self control. In a study carried out among 1,040 Americans it became clear that individuals who lose their weight by diet and exercise are praised more than people who chose Ozempic for it[12].

Public views on off label prescribing

American public is strongly divided over whether or not the physicians should have the right to prescribe Ozempic to patients for non-FDA approved uses. 46.3% believe that physicians prescribing drug is necessary, 37.7% believes activities should be regulated by federal government while 16% remains unsure about it[13].

Behaviour outcomes among Ozempic consumers through AI technology

AI is employed to predict future trends as well as specific period of time during which a patient has a great chance of failing to adhere to Ozempic treatment. Electronic health records and telehealth services are standardized so that healthcare professionals can receive real time information regarding patients' condition. Patients also receive automated notifications if they fail to take medicine. Physicians use dynamic dashboards to track patient's activity levels, caloric intake and compliance status throughout the week[14].

Comparative analysis of physical and mental health state in obese patients on Ozempic ,Mounjaro and Saxenda

Mounjaro was linked to the most frequent cases of GI disturbances (diarrhoea and constipation) as well as alopecia, individuals using Mounjaro had experienced moderate depression. Saxenda had higher incidence of greasy stools, incontinence of stool and headache, individuals taking Saxenda claimed experiencing no depression at all. Ozempic users frequently reported fatigue and drowsiness and specifically Ozempic face (loss of facial fat) , individuals using Ozempic had the highest percentage of severe depression[15]. For clinicians there is a necessity of monitoring changes in mood and behaviour, particularly for individuals who are suffering from depression in order to avoid any negative consequences[16].

Ozempic and the development of thyroid cancer

Based on the analusis of the data from the FDA Adverse Event Reporting System (FAERS), there is a significant correlation between GLP-1 receptor agonists and a higher risk for developing thyroid cancer. There is inconsistency within the clinical literature, some clinical trials do not report any risk associated while other studies shows an increased ridk of medullary and all forms of thyroid cancers after one year of taking Ozempic. Obesity is associated with a 55% higher risk and people suffering from type 2 diabetes

are 1.34 times more likely to develop cancer[17]. FDA warns against use of Ozempic to those who have either a personal or family history of medullary thyroid cancer[18].

Ozempic implications for fertility and pregnancy

Incretins can enhance fertility by improvement of obesity, normalize menstrual cycle and ovulation frequency. On the other hand, administration of the drug in high doses in rats and rabbits was followed by retarded fetal development, early embryonic deaths and malformations of bones and visceral organs. It has been recommended in the literature to discontinue GLP-1 receptor agonists prior one to two months of conception and also avoid use during lactation[19]. From the clinical trials of Ozempic there had 40 cases of unplanned pregnancies out of which 22 live births of normal infants were registered, 6 cases of spontaneous miscarriage occurred and 7 terminated pregnancy by choice. One case of congenital abnormalities was reported. One patient took 1mg/week of semaglutide until forth week of her pregnancy, she gave birth to healthy baby however infant was large in size and exhibited transient hypoglycemia[20]. The obesity stigma increases reproductive concerns, as obesity is stigmatized not only by healthcare professionals but also by society at large[21].

Semaglutide in treatment resistant Schizophrenia with olanzapine induced obesity

In a case report a 39 years old schizophrenia patient who was on high dose of Olanzapine, which caused him to gain more than 100 pounds of weight. After several treatments failure clinicians used Ozempic at a dose of 2mg once per week. Patient managed to reduce his weight by 25 pounds[22].

Ozempic demand and supply shortage

Based on the data obtained from national registers across the country focused on patterns of usage of Ozempic in Denmark between 2018 to 2023, a tenfold growth in user prevalence was noted with the highest percentage (33%) of users who did not suffer from type 2 diabetes. Off label prescription made contribution to the supply shortage as 68% to 83% of all Ozempic initiators[23].

Conclusion

Research findings show that Ozempic helps lower HbA1C levels and decrease body weight. Due to the rapid increase in popularity the drug is widely misused. Apart from typical adverse reactions the Ozempic phenomenon brings concerns such as Ozempic face , possibility of developing thyroid cancer and extreme depressive state.

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