GLP-1 Medications Get at the Heart of Addiction

Diabetes and obesity drugs show promise in treating and preventing all substance use disorders.

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Researchers at Washington University School of Medicine in St. Louis show in a new study that GLP-1 medications may be effective at treating and preventing substance use disorders across all major addictive substances studied, suggesting these drugs target a common biological pathway underlying addiction.

From their beginnings as a treatment for type 2 diabetes, GLP-1 receptor agonists such as semaglutide [Ozempic or Wegovy] and tirzepatide [Mounjaro or Zepbound] have seen an explosion in use, most popularly for weight loss. Patients have reported decreased interest in alcohol and nicotine when taking GLP-1s, and observational studies have shown an association between treatment with GLP-1 medication and lower risk of alcohol and cannabis use disorders, opioid overdose, and alcohol-related hospitalization. But these studies examined substances one at a time. No study has asked the broader question: do GLP-1s work against substance use disorders across the board, and can they reduce the serious harms of addiction, including overdose and drug-related death?

In an analysis of more than 600,000 U.S. veterans with type 2 diabetes, the WashU Medicine team found GLP-1s are tied to a reduced risk of developing substance use disorders across all major addictive substances and to a reduced risk of severe harm, including overdose and death, in people who already have such disorders.

The results appear March 4 in The BMJ.

“In addiction medicine, a lot of treatments target just one thing — for example, a nicotine patch helps with smoking, but not alcohol — but there is no medication that works across addictive substances, let alone all of them,” said senior author Ziyad Al-Aly, MD, a WashU Medicine clinical epidemiologist and Chief of the Research and Development Service at the VA Saint Louis Health Care System. “The revelation about GLP-1 medication is that it really works against all major substances, and it works uniformly, not because it acts against alcohol or opioids or nicotine specifically, but because it is likely acting against the craving itself. It blunts that craving that pulls people toward whatever they’re addicted to.”

Quieting the roar of addiction

In addition to the challenges posed by treating multiple substance use disorders at once, Al-Aly noted that there are some substances, such as methamphetamine, for which there is no medicinal treatment — a potentially even bigger obstacle to recovery. For these cases, Al-Aly wondered if what he was hearing from his patients about how they were able to quit drinking or smoking after starting GLP-1 medication might apply more broadly to any substance. Connecting those anecdotal accounts with the fact that there are GLP-1 receptors in the brain in regions that modulate reward processing, and therefore might affect cravings, Al-Aly and his collaborators investigated whether GLP-1s could treat all substance use disorders.

The team analyzed electronic health records of 606,434 U.S. veterans with type 2 diabetes. The participants were split into two groups: those without a pre-existing substance use disorder and those who already had a substance use disorder. The study looked back on their health records for up to three years, beginning when they started taking either a GLP-1 receptor agonist — most commonly semaglutide, liraglutide [Victoza or Saxenda] or dulaglutide [Trulicity] — or another type of medication, called an SGLT2 inhibitor, to treat their diabetes.

During the study period, the researchers tracked which of the 524,817 participants in the first group developed alcohol, cannabis, cocaine, nicotine, opioid or other substance use disorder. For the second group, those with a pre-existing substance use disorder, the researchers tracked which of the 81,617 participants experienced drug-related emergency department visits, hospitalization, mortality, overdose, or suicidal ideation or attempt.

Compared to patients treated for diabetes with a non-GLP-1 medication, GLP-1 use was associated with 14% reduced risk of developing any substance use disorder. Risk of developing each substance use disorder also declined significantly — by 18% for alcohol, 14% for cannabis, 20% for cocaine and nicotine, and 25% for opioids. This translated into seven fewer new substance use disorder diagnoses per 1,000 GLP-1 users.

Among patients with pre-existing substance use disorder, GLP-1s were tied to fewer hospitalizations, overdoses and deaths related to substance use. After three years, there was a 30% reduction in emergency department visits, 25% reduction in hospitalizations, 40% reduction in overdose and 50% reduction in drug-related deaths. This translated into 12 fewer serious harm events per 1,000 GLP-1 users.

“GLP-1s may offer a dual benefit for patients with chronic conditions like diabetes or obesity who are also struggling with a substance use disorder: one medication can treat both conditions at once,” Al-Aly said.

With millions of Americans already taking GLP-1 medications and use continuing to grow, these effects on preventing and treating substance use disorders could have significant impact at the population level.

Looking ahead, Al-Aly said, the findings support the case for clinical trials to test GLP-1 medications as treatments for addiction in their own right, including trials powered to measure effects on overdose and drug-related death.

“People taking these drugs for obesity often describe a quieting of ‘food noise,’ the persistent preoccupation with food that drives overeating,” Al-Aly said. “What our study suggests is something broader: GLP-1 drugs may also quiet what I call ‘drug noise,’ the relentless craving that drives addiction across substances. That cross-substance signal points to a shared biology underlying addiction, and it opens the door to a fundamentally different approach: not treating one addiction at a time, but targeting that common biologic signal, that common craving across addictions. Moving beyond food noise to drug noise, GLP-1s are quieting the roar of addiction.”

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