For Diabetes Patients Semaglutide may Reduce Smoking Risks

A team of researchers from the National Institutes of Health's National Institute on Drug Abuse and the Case Western Reserve University School of Medicine investigated whether the glucagon-like peptide receptor agonist (GLP-1RA) semaglutide, which has been used to treat obesity and type 2 diabetes mellitus could improve health care measures related to tobacco use disorders.

Study

In the present study, the researchers used electronic health records to conduct a target trial emulation analysis to compare the effectiveness of semaglutide with that of seven other medications for diabetes in improving health measures related to tobacco use disorders.

The seven other medications were thiazolidinediones, sulfonylureas, sodium-glucose cotransporter-2 inhibitors, other GLP-1RAs, metformin, insulins, and dipeptidyl-peptidase-4 inhibitors. The other GLP-1RAs included lixisenatide, liraglutide, exenatide, dulaglutide, and albiglutide.

Three study populations were included in the emulation target trials — those with tobacco use disorders and type 2 diabetes, those with type 2 diabetes, obesity, and tobacco use disorders, and those without obesity diagnoses.

Each study population underwent seven target trials comparing the effectiveness of semaglutide with each of the seven other medications for type 2 diabetes. Individuals were included in the study if they had been diagnosed with type 2 diabetes and tobacco use disorder but had not used any medications for diabetes in the past year and had one or more diseases such as hypertension, hyperlipidemia, obesity, hypercholesterolemia, stroke, or heart disease.

The treatment strategy was to initiate semaglutide treatment instead of one of the seven alternate type 2 diabetes medications. The three healthcare measures examined as the outcomes of interest were medical encounters linked to tobacco use disorder diagnosis, medical prescriptions linked to smoking cessation, and counseling for smoking cessation.

The overall incidence of medical encounters was included as an outcome for sensitivity analysis. Each participant was followed up from initiation of treatment to the first occurrence of any of the measures, follow-up loss, death, or for a year after initiation of treatment.

Findings

The study showed that semaglutide treatment for type 2 diabetes and obesity was associated with a lower risk of tobacco use-related health encounters as compared to other type 2 diabetes medications, especially in the first month of prescription. The study utilized Cox proportional hazards and Kaplan-Meier survival analyses to assess the risk differences, reporting hazard ratios (HRs), and 95% confidence intervals (CIs). For instance, semaglutide showed a significantly lower risk for medical encounters for TUD diagnosis compared to insulins (HR, 0.68 [95% CI, 0.63 to 0.74]) and other GLP-1RAs (HR, 0.88 [CI, 0.81 to 0.96]). Semaglutide use was also linked to lower prescriptions for medications or counseling to stop smoking.

A similar decrease in the risk of tobacco use-related health encounters was observed for individuals without obesity diagnoses. While semaglutide was associated with the lowest risk of tobacco use disorder outcomes, other type 2 diabetes medications have also been reported to lower the rewarding effects of nicotine in animal studies and among human smokers.

The difference in beneficial effects on tobacco use disorder-related health outcomes was the highest between semaglutide and insulin, but the beneficial effects of other GLP-1RAs were only slightly, albeit significantly, lower than those of semaglutide.

Mechanistically, preclinical studies suggest that GLP-1RAs, including semaglutide, modulate the brain's reward and aversive systems. Specifically, GLP-1RA exenatide in rodents has been shown to attenuate nicotine-induced increases in dopamine release in the nucleus accumbens (NAc), a key area involved in the rewarding effects of addictive drugs, and enhance the aversive effects of nicotine by activating the habenular circuit.

The researchers believe, however, that despite these promising findings, the limitations in the study prevent the formation of solid conclusions on the smoking cessation effects of semaglutide. The study's limitations include potential documentation biases, residual confounding, and the lack of granular data on smoking behavior, such as the number of cigarettes smoked per day and the severity of craving and withdrawal. Furthermore, variations in practice patterns among healthcare organizations and patient healthcare utilization could influence the results. Therefore, these results should not be used to justify off-label uses of semaglutide to quit smoking.

Conclusion

To summarize, the study found that the type 2 diabetes medication semaglutide was associated with significantly lower risks of tobacco use disorder-related health encounters. Semaglutide use was also linked to a reduction in smoking cessation medication use or counseling, indicating a decrease in the desire to smoke. Although the results are promising, further studies and clinical trials are necessary to investigate the use of semaglutide to quit tobacco use. Despite the promising results, the study's authors caution against using semaglutide off-label for smoking cessation until further evidence from clinical trials becomes available. The study highlights the complex interplay between smoking cessation, weight management, and overall health outcomes, particularly in patients with comorbid T2DM and TUD.

Source:

https://www.news-medical.net/news/20240729/Semaglutide-may-reduce-smoking-risks-for-diabetes-patients.aspx