Researchers find that diabetes drug could be effective in treating addiction

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Vanderbilt researchers are reporting today that a drug currently used to treat type 2 diabetes could be just as effective in treating addiction to drugs, including cocaine.

The findings, published online today as a Letter To The Editor in the journal Molecular Psychiatry, could have far-reaching implications for patients worldwide who suffer from addiction.

"What we have demonstrated is that a brain mechanism already known to be therapeutic for the treatment of diabetes also appears to be implicated in at least certain types of drug addiction," said Gregg Stanwood, Ph.D., assistant professor of Pharmacology and an investigator within the Vanderbilt Kennedy Center and Vanderbilt Brain Institute.

"We found that this drug called Exendin-4 that is already used for the medical management of diabetes, reduces the rewarding effects of cocaine in animals. We suspect that this is a general mechanism that will translate to additional drugs of abuse, especially other stimulants like amphetamine and methamphetamine."

Co-author Aurelio Galli, Ph.D., professor of Molecular Physiology and Biophysics and Vanderbilt Brain Institute investigator, said Exendin-4 is already FDA-approved for diabetes (Byetta and Bydureon), so this target isn't just "druggable" – it's already "drugged."

"I think the power of this research is that it is so easily translatable to humans because it is already FDA approved," said Galli, also co-director of the Neuroscience Program in Substance Abuse (N-PISA) at Vanderbilt University. "This is the first indication that it will work on psychostimulants. So our studies offer immediate translational opportunities to improve outcomes in human abusers."

"Any disease that is based on dysregulated dopamine can be potentially targeted. There is a lot of co-morbidity between metabolic disorders like diabetes and obesity and psychiatric disease like addiction and schizophrenia."

Lead author, Devon Graham, Ph.D., postdoctoral fellow in Pharmacology, injected animals with a drug called Exendin-4, which is a long-lasting version of the natural peptide hormone GLP-1, and observed a significant blunting of the rewarding effects of cocaine. The findings were consistent, regardless of the Ex-4 dose administered, the authors reported. The study reports no evidence of negative side effects or addiction to Ex-4 treatment.

Stanwood said that although is important to be very cautious in extrapolating the results into the human population, these are very promising data. Addiction in a human being is a very complex disorder with a variety of genetic and environmental factors at play, he said, so it is unlikely that all of human drug addiction would respond homogeneously to this therapy in all people.

"There are no medically based therapies for stimulant addiction that have been successful in the clinic although there are a variety of psychosocial and behavioral therapies that are somewhat effective in some people," Stanwood said. "The beauty of this is that it targets a completely new mechanism so we are cautiously hopeful that the field will be able to exploit this, to provide a pharmacological way to help

patients combat the disorder.

"We don't expect this to be a magic bullet where one can simply take this drug and their addiction goes away, but hopefully a medicine like this, in combination with social and behavioral support, will help an addict on the road to recovery," he said.

Provided by Vanderbilt University Medical Center