

Medicating for mental health—Intense exercise before taking a daily dose could prevent weight gain, diseases

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Professor David Wright, Department of Human Health & Nutritional Sciences, University of Guelph. Credit: University of Guelph

Weight gain and Type 2 diabetes are potential side effects in people taking a common medication to treat mental illness.

Now a new University of Guelph study has revealed that a single bout of intense exercise performed right before taking a dose of [olanzapine](#) could be a way to prevent these side effects.

Published in the journal *Scientific Reports*, the study investigated how a single bout of intense exercise could reduce olanzapine-induced hyperglycemia in male mice. Olanzapine is an anti-psychotic medication that is used in the treatment of schizophrenia and causes [blood sugar](#) levels to rise with each dose taken.

"Acute repeated spikes in blood sugar that you see with each dose of this drug have long-term impacts - and can predispose patients to the development of insulin-resistance Type 2 diabetes and [cardiovascular disease](#)," said David Wright, associate professor in the Department of Human Health and Nutritional Sciences and corresponding author of the paper.

Patients generally take such drugs as olanzapine over a long period, meaning that they may have serious impacts on patients' overall health, added Wright.

"If you look at the average [life expectancy](#) of an individual with schizophrenia versus someone in the general population, it's a 20-year gap. If we can reduce the side effects associated with [blood glucose levels](#), hopefully we can improve life expectancy and the overall quality of life."

In their study, Wright and PhD student Laura Castellani exercised mice by having them run until they reached exhaustion before giving them a dose of olanzapine. The researchers discovered the exercise prevented the rise in blood glucose levels that typically occurs when taking the medication.

However, the researchers found it must be [intense exercise](#). When they repeated the tests with only [moderate exercise](#) similar to a fast jog, blood glucose levels still rose in mice because of the medication.

Although these findings are encouraging, Wright says there are challenges.

"Translating these findings to humans will be difficult, especially considering that patients taking anti-psychotics have a very low level of exercise adherence," he said. "The next step is to see if we can identify the pathways that are activated during exercise so that we can perhaps target them pharmacologically or nutritionally."

While clinicians have been looking at different ways to prevent higher blood glucose levels by prescribing anti-diabetic drugs, Wright said his lab is interested in exercise physiology and trying to figure out how exercise can improve glucose homeostasis.

"Cardiovascular disease is the leading cause of death in individuals that have schizophrenia," said Wright. "And obviously not everything can be attributed to the metabolic effects of these drugs. But if we can look at the big picture and reduce these side effects, hopefully life expectancy and quality of life can be improved because once you go on these drugs you can't really go off of them."

More information: Laura N. Castellani et al, Exercise Protects Against Olanzapine-Induced Hyperglycemia in Male C57BL/6J Mice, *Scientific Reports* (2018). [DOI: 10.1038/s41598-018-19260-x](https://doi.org/10.1038/s41598-018-19260-x)

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