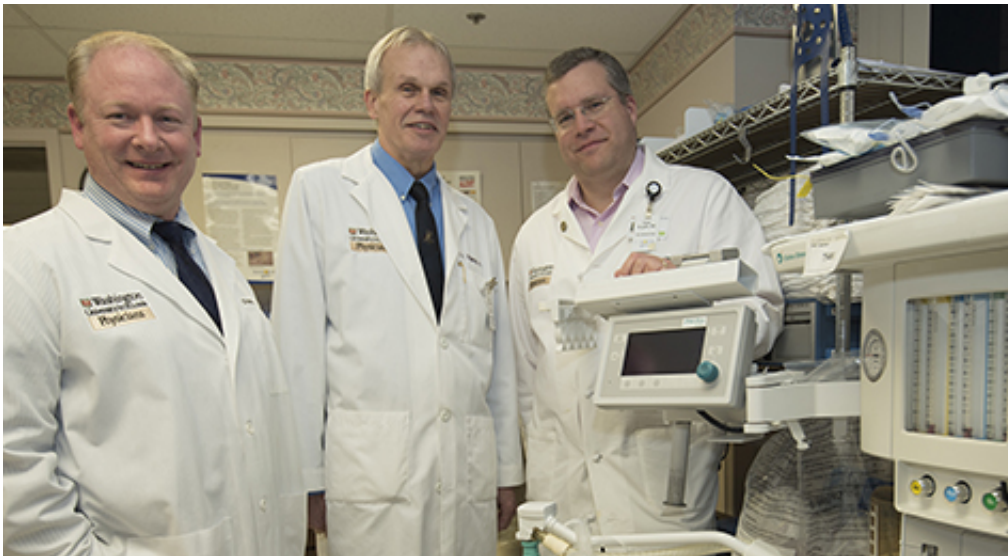


Laughing gas studied as depression treatment

December 9 2014



Psychiatrists Charles R. Conway, M.D., (from left) and Charles F. Zorumski, M.D., worked with anesthesiologist Peter Nagele, M.D., on a small, pilot study in which nitrous oxide was given to patients with treatment-resistant depression. The team plans further research based on results suggesting that the gas may be a possible treatment for depression. Credit: Robert Boston

Nitrous oxide, or laughing gas, has shown early promise as a potential treatment for severe depression in patients whose symptoms don't respond to standard therapies. The pilot study, at Washington University School of Medicine in St. Louis, is believed to be the first research in which patients with depression were given laughing gas.

In 20 [patients](#) who had treatment-resistant clinical [depression](#), the researchers found that two-thirds experienced an improvement in symptoms after receiving [nitrous oxide](#). In comparison, one-third of the same patients reported improved symptoms after treatment with a placebo. The patients were evaluated on the day of and day after each treatment.

The findings, presented Dec. 9 at the annual meeting of the American College of Neuropsychopharmacology in Scottsdale, Ariz., were published online the same day in the journal *Biological Psychiatry*.

Although the researchers, from the university's Departments of Anesthesiology and Psychiatry and the Taylor Family Institute for Innovative Psychiatric Research, evaluated the effects of the treatment only twice over a 24-hour period, they are encouraged by the results.

"Our findings need to be replicated, but we think this is a good starting point, and we believe therapy with nitrous oxide eventually could help many people with depression," said principal investigator Peter Nagele, MD, assistant professor of anesthesiology at the School of Medicine.

As many as one-third of patients with [clinical depression](#) do not respond to existing treatments, which points to the need to develop more effective therapies. Laughing gas is attractive because its side effects are limited—the most common are nausea and vomiting—and it leaves the body very quickly after people stop breathing the gas.

That's why the researchers believe the improvement in symptoms a day later is real and not a side effect of the nitrous oxide. Further, they cite an anecdotal finding from the study that the improvements lasted for at least one week in some patients.

As part of the study, patients received two treatments, but neither the

subjects nor the researchers knew the order in which those treatments were given. In one session, patients were given a gas mixture that was half oxygen and half nitrous oxide—the same mixture dentists give to patients undergoing dental procedures.

In a second session, the patients received a placebo mixture of oxygen and nitrogen, the two main gases in the air we breathe.

Two hours after each treatment, and again the next day, the study subjects were surveyed about the severity of their symptoms, such as sadness, feelings of guilt, suicidal thoughts, anxiety and insomnia. One day after nitrous oxide treatment, seven patients reported mild improvement in their symptoms, while another seven reported significant improvement. Three patients reported that their symptoms had disappeared almost completely. No patients said their symptoms worsened after treatment with nitrous oxide.

Meanwhile, after receiving the placebo, one patient reported worse symptoms the next day, five reported mild improvements, and two reported that they felt significantly better.

"When they received nitrous oxide, many of the patients reported a rapid and significant improvement," said co-investigator Charles R. Conway, MD, associate professor of psychiatry. "Although some patients also reported feeling better after breathing the placebo gas, it was clear that the overall pattern observed was that nitrous oxide improved depression above and beyond the placebo. Most patients who improved reported that they felt better only two hours after treatment with nitrous oxide. That compares with at least two weeks for typical oral antidepressants to exert their beneficial, antidepressant effects."

With standard antidepressants, such as Prozac, Zoloft, Lexapro and other selective serotonin reuptake inhibitors (SSRIs), patients and their doctors

often wait several days or weeks before they know whether treatments are working. The effects of treatments such as cognitive behavior therapy also often aren't obvious for weeks.

"If our findings can be replicated, a fast-acting drug like this might be particularly useful in patients with [severe depression](#) who may be at risk for suicide and who need help right away," said co-investigator Charles F. Zorumski, MD, the Samuel B. Guzé Professor and head of the Department of Psychiatry and director of the Taylor Family Institute. "Or perhaps the drug could be used to relieve symptoms temporarily until more conventional treatments begin to work."

The researchers said more studies are needed to learn whether nitrous oxide has the same benefits in other patients with depression. They also plan to test various concentrations of [laughing gas](#) to see how each influences [symptoms](#) of depression. Those studies will begin soon.

"It's kind of surprising that no one ever thought about using a drug that makes people laugh as a treatment for patients whose main symptom is that they're so very sad," Nagele said.

More information: Nagele P, Duma A, Kopec M, Gebara MA, Parsoei A, Walker M, Janski A, Pahagopoulos VN, Cristancho P, Miller JP, Zorumski CF, Conway C. Nitrous oxide for treatment-resistant major depression: a proof-of-concept trial. *Biological Psychiatry*, published online Dec. 9, 2014.

Provided by Washington University School of Medicine

Citation: Laughing gas studied as depression treatment (2014, December 9) retrieved 5 May 2024 from <https://medicalxpress.com/news/2014-12-gas-depression-treatment.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.