

ToxTalks: Substances of Use and Misuse Highlights from the Field

A 24 year old male intentionally ingested phenibut to self-treat his anxiety. He became unresponsive and a bystander called EMS. Upon arrival, EMS found the patient with mid-point pupils, marked sedation, and respiratory depression. Naloxone 2 mg was administered without success. On arrival to the emergency

department, his gag was intact and he responded to voice and noxious stimuli,

respiratory rate 12 breaths/min; blood pressure 92/40 mmHg, and temperature

was negative. He was admitted to the intensive care unit for monitoring and he

gradually improved with all symptoms resolved on day 2 of admission. His urine was sent for advanced analytic testing and found to be positive for phenibut.

37.9° C. His basic laboratory tests were unremarkable and urine drug screen

but rapidly drifted back to sleep. His vital signs were: pulse 54 beats/min;

Blue Ridge Poison Center

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University of Virginia Health

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Phenibut

This is a special edition dedicated to substance use & misuse. Look for more of these editions as we encounter emerging and growing concerns. Funding support provided by the CDC's Prescription Drug Overdose: Prevention for States program in partnership with the Virginia Department of Health.



What is phenibut?

Phenibut (4-amino-3-phenyl-butyric acid) is a GABA analog first synthesized in the 1960s in the former Soviet Union. It was previously used as part of the Russian cosmonaut space kit as an anti-anxiety medication to help the astronauts stay calm in space. It is still available by prescription in Russia and is used for anxiety, post-traumatic stress disorder, stuttering and vestibular

Continued next page

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disorders. In the United States (U.S.), phenibut is not available for prescription but it is sold online and in stores selling cannabis and tobacco products, marketed as a stress relieving agent. It is also sold as a *nootropic* substance, which is a substance that enhances one's cognitive abilities. Phenibut is also contained in products sold as nutritional supplements however, it does not meet criteria to be defined as a dietary ingredient by the Food and Drug Administration and thus is not allowed to be labeled as such. There has been an increase in use in the U.S. noted since 2015 with phenibut being widely available for purchase online both in powdered and tablet form.

How does phenibut work?

Phenibut works primarily as a GABA-B receptor agonist. It also has some GABA-A agonism and increases dopamine levels. Other GABA-B agonists include such drugs as baclofen and gamma-hydroxybutyrate (GHB).

What symptoms are caused by phenibut use and how are symptoms treated?

Phenibut is advocated for anxiolytic, euphoric and nootropic properties. It causes symptoms consistent with a sedative/hypnotic toxidrome, including decreased consciousness, stupor, and depressed respiratory drive. Vitals signs may demonstrate bradycardia, bradypnea, hypotension, and hypothermia. It also been reported to cause agitation, hallucinations, seizures and delirium. Seizures may be related to the feedback inhibition of GABA-B receptor on presynaptic GABA-A neurons.

Treatment of symptoms is largely supportive and may include intravenous fluids, airway monitoring and potentially benzodiazepines for seizures. If severe agitation is present, consider withdrawal in the diagnosis and not acute intoxication.

Figures: The bottle pictured was purchased at a store one block from the Blue Ridge Poison Center. Note the product contains both phenibut and tianeptine. The bottle also states that the contents are for "Research Purposes Only", even though the store clerk was willing to give advice on its indications for use if taken by patrons.



BRPC STAFF

Director Christopher Holstege, MD

Nursing Director John Gilday, MSN, NREMT-P

Medical Toxicologists Andy Baer, MD Nathan Charlton, MD Justin Rizer, MD

Medical Toxicology Fellows Ryan Cole, MD Will Goodrich, DO Abigail Kerns, MD David Schaffer, MD

Epidemiologist Rita Farah, PharmD, MPH, PhD

Senior Poison Specialist Jennifer Horn, BSN, CSPI

Poison Specialists Andre Berkin, BSN, CSPI Michael Brookshire, BSN, CSPI Katerina Deasy, BSN Liz Martin, RN

Steven Yoder, BSN, CSPI Public Health Educator Kristin Wenger, MA, BS

Lisa Turner, BSN, CSPI

Administrative Specialist Heather Collier Amanda King

What symptoms are caused by phenibut withdrawal?

Tolerance to phenibut has been demonstrated and thus withdrawal symptoms can occur with cessation of use. Withdrawal from phenibut resembles baclofen withdrawal and may include hallucinations, psychosis, agitation, tachycardia, hyperthermia, seizures, and myoclonus.

Treatment of phenibut withdrawal and treatment can be started with GABA-A agonists (e.g., benzodiazepines). However, because the primary mechanism of phenibut is GABA-B agonism, there are case reports using baclofen, another GABA-B agonist. There is no approved dosing regimen for baclofen for phenibut withdrawal, instead it should be tailored to the patient's clinical effects. Symptoms of withdrawal can be severe and may require management in an ICU setting.

For guidance treating patients with tianeptine toxicity call the Blue Ridge Poison Center at 1-800-222-1222. Medical toxicology experts are standing by for free consultation 24-hours a day, every day.

References available upon request.

