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COMPLEX MEDICAL-PSYCHIATRIC ISSUES (MB RIBA, SECTION EDITOR)

Phenibut (β-Phenyl-γ-Aminobutyric Acid): an Easily Obtainable "Dietary Supplement" With Propensities for Physical Dependence and Addiction

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Abstract

Purpose of Review Phenibut (β-phenyl-γ-aminobutyric acid) is a psychoactive GABA analogue currently being marketed online as an anxiolytic and nootropic dietary supplement. Its use is growing in popularity, but its pharmacological activity is well beyond that of a conventional nutritional supplement, and similar to that of a prescription strength sedative. This review will focus on the potential adversities of phenibut use and will discuss what treatment options may be beneficial to afflicted patients.

Recent Findings Over the last several years, multiple case reports have highlighted phenibut's potential to produce the conditions of physical dependence, withdrawal, and addiction. In cases involving intoxication, patients have presented with a varying degree of mental status changes, from being minimally responsive to manifesting symptoms of an agitated delirium.

Summary Phenibut is a potent psychoactive substance with $GABA_B$ agonist properties, which is emerging as a drug of misuse through growing internet sales. Its marketing as a "dietary supplement" is inaccurate and misleading, given its pharmacological profile and ability to induce the physiological changes associated with withdrawal and physical dependence.

Keywords Phenibut · Nootropic · New psychoactive substance · Baclofen · $GABA_B$ agonist · Dietary supplement

Introduction

Phenibut (β-phenyl-γ-aminobutyric acid) is an analog of the inhibitory neurotransmitter GABA (γ-aminobutyric acid), with potent psychotropic effects. It was first synthesized in St. Petersburg, Russia, in the early 1960s, and was at one time placed in the medical kits provided to Soviet cosmonauts [1]. The drug has been sold under the brand names of Noofen and Anvifen, and produces a wide range of psychological effects, including sedation and purported nootropic (cognitive enhancing) effects. Phenibut is not available for prescribed use in the USA, European Union, or Australia, although it can be legally purchased as a dietary supplement through a variety of online vendors [2]. The drug acts predominately as a $GABA_B$ agonist, although other receptor systems may be involved [1].

Outside of Russia and the former Soviet Republics, phenibut was relatively unknown until 2011, when a quantity of the drug was seized in Sweden, and the European authorities were alerted [2, 3•]. Due to concerns for potential misuse, phenibut was reported to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) and Europol in 2012 [2]. In the EMCDDA–Europol 2012 Annual Report on the implementation of Council Decision, it was noted that phenibut was "being sold both as a 'dietary supplement' and 'research chemical' in a number of EU Member State" [4]. Since that time, the availability of the drug through online procurement has increased, and reports regarding phenibut misuse, intoxication, and physical dependence have been published.

Following the notification to EMCDDA, phenibut was classified as a *new psychoactive substance* (NPS) in 2012 by the United Nations Office of Drug and Crime (UNODC). NPS is defined by UNODC as: "a substances of abuse, either in a pure form or a preparation, that are not controlled by the 1961 Single Convention on Narcotic Drugs or the 1971 Convention on Psychotropic Substances, but which may pose a public health threat" [2, 3•]. The term NPS, however, can be misleading, given that the term "new" does not necessarily infer a new drug discovery, and may indicate the emergence of a

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previously known substance into the arena of drug misuse. Many drugs classified as NPS were first synthesized several decades ago, including phenibut [5].

The appearance of NPS has been rapidly growing over the last several years. According to a 2018 report by UNODC, between 2009 and 2016, 106 countries and territories reported the emergence of 739 different NPS to their office [6]. Since the monitoring of NPS began by UNODC in 2009, new substances have been emerging at a rate one per week [6].

To date, it appears that Australia has been the only country that has taken legal action against the sales of phenibut. In February of 2018, the Therapeutic Goods Administration of Australia officially listed phenibut as a prohibited substance [7].

Despite the modern concerns for misuse, the prescribed therapeutic benefits of phenibut have been shown in Russia, where the drug has been predominately studied since the mid-1960s. In a 2001 review, Lapin described that "phenibut is widely used in Russia" to treat multiple conditions, including anxiety, insomnia, PTSD, stuttering, and vestibular disorders [1].

A Dietary Supplement?

Due to its structural similarities to GABA (an amino acid), phenibut is technically a "food" in the eyes of the US Food and Drug Administration (FDA), and is therefore not regulated as a drug or even as an over the counter (OTC) medication. Based on the Dietary Supplement Health and Education Act (DSHEA) of 1994, amino acids are considered dietary supplements (food) and can thus circumvent the scrutiny of FDA drug regulations [8].

The DSHSEA defines a dietary supplement as: "a product (other than tobacco) intended to supplement the diet that bears or contains one or more of the following dietary ingredients: (A) a vitamin; (B) a mineral; (C) an herb or botanical; (D) an amino acid; (E) a dietary substance used by man to supplement the diet by increasing the total dietary intake; or (F) a concentrate metabolite, constituent, extract, or combination of any ingredient described in clause (A), (B), (C), (D), or (E)" [8, 9].

Some FDA policies regarding dietary supplements can be accessed through the FDA's website. Some relevant points are listed below:

- The FDA is not authorized to review dietary supplement products for safety and effectiveness before they are marketed [10].
- Federal law does not require dietary supplements to be proven safe to FDA's satisfaction before they are marketed [11].
- For most claims made in the labeling of dietary supplements, the law does not require the manufacturer or seller to prove to FDA's satisfaction that the claim is accurate or truthful before it appears on the product [11].
- Dietary supplement manufacturers do not have to get the agency's approval before producing or selling these products [11].

Currently, phenibut can be easily purchased through several online vendors, in the USA and abroad. Sellers offer the drug in several forms: powder, capsules, and "fine crystals." In a 2016 study from the UK, 48 unrelated online retailers were identified as vendors for phenibut [3•]. Similar data related to quantifying phenibut availability and sales in the USA could not be located.

Pharmacology

A thorough review of phenibut's pharmacology was published by Lapin in 2001, who noted that the drug had similar pharmacological activity as GABA, and described it as "GABA-mimetic" [1]. Its primary mechanism of action has been reported as a $GABA_B$ receptor agonist, although its interaction with multiple other receptor systems has been described [1].

Structurally, phenibut is a GABA molecule with a phenyl group attached at the beta carbon (Fig. 1). The addition of this phenyl group gives the drug a greater permeability through the blood brain barrier compared to GABA; however, it does not provide more potent pharmacological effects [1]. The addition of a single chlorine atom to the phenyl ring of phenibut produces the spasmolytic drug baclofen (β-p-Cl-phenyl-γ-aminobutyric acid). Thus, strong structural commonalities exist between GABA, baclofen, and phenibut [1].

GABA is the primary inhibitory neurotransmitter in the CNS and produces effects through the activation of two mechanically different receptors: $GABA_A$ and $GABA_B$ [12, 13]. The $GABA_A$ receptor is an ionotropic ligand-gated chloride channel and provides rapid neuronal inhibition [12]. The receptor is the target for many sedative/hypnotic drugs, including benzodiazepine, barbiturates, and the non-benzodiazepine

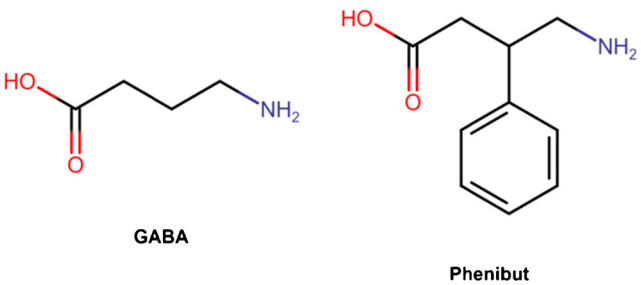

Fig. 1 Molecular structures of GABA and phenibut

Z drugs, such as zolpidem. The $GABA_B$ receptor, contrarily, is a metabotropic G protein–coupled receptor, which mediates slow and protracted inhibitory neurotransmission in the CNS, and maintains an inhibitory tone [12]. Baclofen, which is used to treat muscle spasticity in several neurological disorders such as multiple sclerosis, is a $GABA_B$ receptor agonist [12, 13].

Lapin described other potential pharmacological activity, including activation of $GABA_A$ receptors, activation of dopamine metabolism, and antagonism of phenylethylamine (PEA). More recently, phenibut's activity on voltage-dependent calcium channels (VDCC) was shown in animal models by Zvejniece et al. in 2015, which is the same mechanism associated with the anti-nociceptive properties of gabapentin [14].

Intoxication, Withdrawal, and Addiction

Given the pharmacological and physiological activity demonstrated by phenibut, clinicians should be mindful of 3 potential conditions associated with phenibut use: intoxication, withdrawal, and addiction.

Intoxication In almost all case reports of phenibut intoxication, patient presented to an emergency room with varying changes in mental status, and reported utilizing excessively high doses of phenibut [15–20]. The dangers of phenibut overdose are apparently known to suppliers, considering that dosage recommendations are provided, and some convey warnings against using more than 2000 mg daily. Notwithstanding this information, patients have engaged in self-titration of phenibut to dangerously high dosages, given the relatively ease of availability and the absence of any medical supervision. In several case reports, patient reported using greater than 8 g per day [16, 19, 21•]. However, even while abiding by recommended dosages, some patients have experienced severe withdrawal upon phenibut discontinuation. In one report, a patient presented with tremors, agitation, decreased appetite, and insomnia, only after 10 days of phenibut use at a dose of 1 g daily [22].

The presenting symptoms associated with intoxication and overdose has varied (see Table 1). Several authors have described altered levels of consciousness and somnolence [15, 19], while others have reported aggression, combativeness, and delirium [15–17, 20]. In one case described by Joshi et al., a patient using 16 g of phenibut daily presented with dissociative symptoms, delusions, tangential and illogical thought processes, and aggressive behaviors. The patient necessitated 9 days of inpatient psychiatric care before he returned back to his baseline mental health state [16]. In several cases of phenibut intoxication, aggressiveness and mental status changes have necessitated airway protection with endotracheal intubation [15–17, 20].

Table 1 Comparison of the reported symptoms associated with phenibut intoxication and withdrawal

Phenibut intoxication/overdose	Phenibut withdrawal
Sedation	Anxiety
Decreased level of consciousness	Agitation
Agitation	Tremulousness
Combativeness	Heart palpitations
Delirium	Decreased appetite
Psychosis	Insomnia
	May mimic BZD withdrawal

The physical signs and symptoms attributable to phenibut intoxication appear to be nonspecific and vary. Interestingly, three authors have reported pupillary dilation upon assessment in the emergency department [16, 19, 20]. The relevance of this is unclear, and poly-drug ingestion may be contributing factor. There is no specific treatment or antidote for phenibut overdose, and supportive care and symptom management are the recommended interventions. Death resulting from exclusive phenibut use has not been reported.

Withdrawal Physiological withdrawal symptoms following phenibut discontinuation have been reported and appear to mimic a benzodiazepine withdrawal syndrome. Authors have reported that patients in phenibut withdrawal experience insomnia, anger, irritability, tremulousness, decreased appetite, and heart palpations with phenibut [22, 23••, 24]. In one case report, the patient experienced visual hallucinations [24]. These withdrawal states can be quite distressing, and will typically cause a patient to seek medical or psychiatric services. The mitigation of the withdrawal syndrome has been challenging, and both phenobarbital and baclofen have been studied and found to be beneficial [21, 23••]. Samokhvalov et al. demonstrated a successful 12-week detoxification off phenibut by using baclofen, in a patient using 8 g of phenibut daily [23••]. The authors estimated substituting 8–10 mg of baclofen for every 1 g of phenibut used by the patient. Other authors have published similar successful detoxifications with baclofen [16]. In 2017, Brunner and Levy demonstrated a successful 9-day phenibut detoxification with phenobarbital, at a starting dose of 62.8 mg q.i.d. [21•].

Addiction In addition to the documented cases of phenibut intoxication/overdose and withdrawal, reports of phenibut addiction have been also been described [17, 21•]. Thus, clinicians should be monitoring for behavioral aberrancies in patients who regular report phenibut use. Given the pharmacological properties of phenibut and its effects resembling those of a sedative, *a sedative/hypnotic or anxiolytic use disorder*

would be the most appropriate diagnostic term, based on DSM-5 nomenclature.

While phenibut alone certainly possesses some addictive liability, it has also been misused in patients with other substance use disorders, including heroin [21•], and alcohol use disorders [18, 23••]. Additionally, coingestion with other addictive substances has also been reported. In one case, the use of anabolic steroids and dextromethorphan was noted [17], and in another, alcohol and THC were being used with phenibut [15]. Authors have also reported on the coingestion of unapproved pharmaceuticals. El Zahran et al. showed phenibut to be a common coexposure in patients misusing tianeptine, a tricyclic antidepressant with opioid agonist properties, which is prescribed for use in Europe, Asia, and Latin America [25]. The occurrence of poly-drug ingestions with phenibut is concerning, and is growing evidence for the continued misuse of this substance.

Given phenibut's structural and pharmacological similarities to baclofen, the addictive liability of baclofen was also reviewed for this paper. While the literature is sparse, several case reports of baclofen addiction have been published [26–28].

Patient Assessment

For the clinician, determining if a patient is misusing phenibut (or any other substance) can be challenging. Patients who experience substance use difficulties may be hesitant to share such details with their healthcare provider, due to embarrassment, shame, fear of legal consequences, confidentiality concerns, or any combination of the above. Given this apprehension, a urine drug screen (UDS) is often obtained to augment a patient's self-report, when a substance use disorder is being considered. Unfortunately, phenibut is not detected in a standard immunoassay drug screen, and more advanced laboratory technology is required. In one case report, the authors used liquid chromatography-mass spectrometry (LC/MS) for quantification of phenibut in plasma [15]. Institutions and ambulatory clinics, however, will vary with their ability to detect phenibut through LC/MS and other methods. In many cases, especially in facilities where only basic laboratory services are offered, detection of phenibut will not be possible. Nonetheless, the collection of a UDS is still highly recommended, since it may detect some common substances of misuse and thus aid in the potential identification of an underlying addiction.

In addition to the UDS, clinicians should also review the patient's prescription monitoring report from their state's PDMP. Unanticipated results on either the patient's UDS or PDMP report should raise concern, and further clinical investigation should be undertaken. It is worthwhile to note that any unexpected result on either a UDS of PDMP report does not conclude a diagnosis of addiction. Such a diagnosis should only be made after a thorough assessment and review of the pertinent DSM-5 diagnostic criteria.

Given that addiction is a behavioral syndrome, particular attention should be given to the patient's behavioral patterns related to drug acquisition and use. A clinician should first determine if a patient is making efforts to obtain a potential addictive substance. It is imperative that interviewer be empathetic and nonjudgmental when conducting this type of questioning. This will increase the yield of a truthful and reliable answer. Some examples of questions which may be perceived as judgmental by the patient include the following:

1. Are you currently abusing any drugs?
2. Are you buying any drugs off the street or internet?
3. Are you using drugs that you should not be using?

In general, the term "abuse" should not be used when conducting a substance use assessment. It infers abhorrent behaviors, and may contribute to the patient feeling judged or misrepresented. In some cases, identifying that the patient may be struggling with an underlying mental health condition may soften their defensiveness, and may allow the patient to become less guarded with the clinician. More appropriate questions that may be used in conducting a substance use assessment include the following:

1. Some of my patients use supplements they find online to help with their anxiety. Have you purchased anything like this to help with your symptoms?
2. With some drugs, it can become very easy for you to take more than you should. I am wondering if you ever experienced that, and may be taking more than you would like to?
3. Do you ever look for ways to change the way you feel? What have you looked for in the past, and have you ever used the internet to help you?

If phenibut use is disclosed by the patient, clinicians should explore what is driving the individual's online seeking of mood enhancing substances, in pursuance of ruling out an underlying psychiatric disorder. Turner et al. concluded that between 21.9 and 24.1% of patients use alcohol and/or other substances to help relieve symptoms associated mood and anxiety disorders [29]. Alleviation of social anxiety was found to be one of most common desirable effects of phenibut use, in a 2016 study conducted by Owen et al. [3•].

Treatment

The first step in treatment in phenibut use is to identify the underlying clinical concern or diagnosis. It is important for

clinicians to keep in mind that a presentation involving excessive phenibut use does not necessarily infer a diagnosis of a substance use disorder (addiction). Although that may be the case, it is imperative to thoroughly assess the behavioral patterns and screen for any underlying mental health difficulty. It is not uncommon for patients to misuse substances as a means of self-soothe emotional distress, in the absence of addiction. Thus, clinicians should evaluate for any mood or anxiety disorders and implement the appropriate therapies if such an ailment becomes recognized.

If phenibut addiction is present or highly suspected, the patient should be referred to a substance use treatment facility for further evaluation. There are no specific treatments designated specifically for phenibut addiction, and patients should be treated with the traditional evidence-based SUD psychotherapies along with supportive pharmacotherapies, if indicated.

Given the propensity of phenibut to precipitate states of physical dependence and withdrawal, a medically supervised detoxification may be necessary. Substituting phenibut with either baclofen or phenobarbital has been successfully used in detoxification, as previously stated [21•, 23••]. Having the patient self-taper, their use of phenibut is not recommended for many reasons, but namely because it hinders the clinician's ability to accurately track the amount of drug being used during the tapering process. Additionally, given that most clinicians have no experience prescribing or monitoring phenibut, they will be unfamiliar with dosage requirements, pharmacokinetic or pharmacodynamic properties, and general med management strategies.

Once the patient has completed an initial addiction treatment program, they should be monitored regularly over the long term, in view of addiction as a chronic relapsing-remitting disease.

Conclusion

Phenibut is a highly potent psychoactive substance, which has the potential to produce states of intoxication, physical dependence, withdrawal, and potentially addiction. Each of these drug-induced alterations in physiology can be potentially harmful, but despite this, phenibut is easily attainable without a prescription through online purchase. The drug has been inappropriately marketed as a nutritional supplement, which is misleading to the public. Phenibut acts as a $GABA_B$ agonist, similar to the prescription drug baclofen, and renders psychological effects similar to those of prescribed sedatives. In overdose situations, phenibut has precipitated a wide spectrum of intoxicating states, from somnolence to agitation, and in the most severe cases, delirium. Clinicians should be mindful of these potential effects, and screen patients presenting with phenibut-related concerns for an underlying psychiatric illness and/or substance use disorder.

Given the concerns published in multiple recent case reports, the regulatory authorities should vigorously review the legal status and classification of phenibut, since it does not function as nutritional or dietary supplement as currently advertised.

Although the unmonitored recreational use of phenibut use has led to adverse outcomes, there is evidence to suggest potential therapeutic potential, and this should be explored further. Phenibut is structurally and pharmacologically similar to baclofen, and possesses potential anxiolytic and sedating properties. Some authors have suggested that it may helpful in treating alcohol use disorders and benzodiazepine withdrawal [23••]. As stated, the drug has been used with reported success in Russia, and may provide treatment alternatives for some psychiatric and neurological conditions, in the context of appropriate prescribing, monitoring, and continued research.

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Compliance with Ethical Standards

Conflict of Interest Edward A. Jouney declares no potential conflicts of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

References

Papers of particular interest, published recently, have been highlighted as:
- • Of importance
- •• Of major importance

1. Lapin I. Phenibut (beta-phenyl-GABA): a tranquilizer and nootropic drug. CNS Drug Rev. 2001;7(4):471–81.
2. Van Hout MC. A narrative review of the naturally occurring inhibitory neurotransmitter gamma-aminobutyric acid (GABA) called phenibut in dietary supplements. Perform Enhance Health. 2018;6(1):33–5. https://doi.org/10.1016/j.peh.2018.02.001.
3.• Owen DR, Wood DM, Archer JR, Dargan PI. Phenibut (4-amino-3-phenyl-butyric acid): availability, prevalence of use, desired effects and acute toxicity. Drug Alcohol Rev. 2016;35(5):591–6. https://doi.org/10.1111/dar.12356 **Internet availability of phenibut in the UK is reviewed, in addition to a analysis of the symptoms patients may be attempting to self-soothe. This highlights the ease of availablity through multiple online vendors, and**

providers a glimpse into what may be driving patients to use phenibut.

4. EMCDDA-Europol. New drugs in Europe, 2012, EMCDDA-Europol 2012 Annual Report on the implementation of Council Decision 2005/387/JHA. Luxembourg: Publications Office of the European Union; 2013.
5. UNODC: United Nations Office on Drugs and Crime. UNODC Early Warning Advisory (EWA) on New Psychoactive Substances (NPS). https://www.unodc.org/LSS/Home/NPS. Accessed 10 Sept 2018.
6. UNODC: United Nations Off ice on Drugs and Crime. Global Smart Update. Understanding the synthetic drug market: the NPS factor. Volume 19, March. https://www.unodc.org/documents/scientific/Global_Smart_Update_2018_Vol.19.pdf.
7. Mellor, L. What is Phenibut? The cosmonaut drug that may have caused a school overdose. ABC News. 22 Feb 2019 11:54pm. https://www.abc.net.au/news/2018-02-23/what-is-phenibut-the-drug-suspected-in-school-overdose/9475814. Accessed 10 Sept 2018.
8. Stohs SJ, Preuss HG. What health care professionals should know about the regulation and safety of dietary supplements. J Am Coll Nutr. 2017;36(4):306–9. https://doi.org/10.1080/07315724.2016.1275065.
9. U.S Food and Drug Administration. Dietary Supplement Health and Education Act of 1994. Public Law 103-417, 103rd Congress. http://dshedu.whnlive.com/DSHEA_Legal/dshea.html. Accessed 10 Sept 2018.
10. FDA. Dietary supplements: what you need to know. https://www.fda.gov/food/resourcesforyou/consumers/ucm109760.htm. Accessed 11 Sept 2018; 2018.
11. FDA. FDA 101: dietary supplements. https://www.fda.gov/ForConsumers/ConsumerUpdates/ucm050803.htm. Accessed 13 Sept 2018; 2018.
12. Frangaj A, Fan QR. Structural biology of GABAB receptor. Neuropharmacology. 2018;136(Pt A):68–79. https://doi.org/10.1016/j.neuropharm.2017.10.011.
13. Jacobson LH, Vlachou S, Slattery DA, Li X, Cryan JF. The gamma-aminobutyric acid B receptor in depression and reward. Biol Psychiatry. 2018;83(11):963–76. https://doi.org/10.1016/j.biopsych.2018.02.006.
14. Zvejniece L, Vavers E, Svalbe B, Veinberg G, Rizhanova K, Liepins V, et al. R-phenibut binds to the alpha2-delta subunit of voltage-dependent calcium channels and exerts gabapentin-like anti-nociceptive effects. Pharmacol Biochem Behav. 2015;137:23–9. https://doi.org/10.1016/j.pbb.2015.07.014.
15. Downes MA, Berling IL, Mostafa A, Grice J, Roberts MS, Isbister GK. Acute behavioural disturbance associated with phenibut purchased via an internet supplier. Clin Toxicol. 2015;53(7):636–8. https://doi.org/10.3109/15563650.2015.1059945.
16. Joshi YB, Friend SF, Jimenez B, Steiger LR. Dissociative intoxication and prolonged withdrawal associated with phenibut: a case report. J Clin Psychopharmacol. 2017;37(4):478–80. https://doi.org/10.1097/JCP.0000000000000731.
17. Li W, Madhira B. Phenibut (beta-phenyl-gamma-aminobutyric acid) psychosis. Am J Ther. 2017;24(5):e639–e40. https://doi.org/10.1097/MJT.0000000000000618.
18. O'Connell CW, Schneir AB, Hwang JQ, Cantrell FL. Phenibut, the appearance of another potentially dangerous product in the United States. Am J Med. 2014;127(8):e3–4. https://doi.org/10.1016/j.amjmed.2014.03.029.
19. Sankary S, Canino P, Jackson J. Phenibut overdose. Am J Emerg Med. 2017;35(3):516 e1–2. https://doi.org/10.1016/j.ajem.2016.08.067.
20. Wong A, Little M, Caldicott D, Easton C, Andres D, Greene SL. Analytically confirmed recreational use of Phenibut (beta-phenyl-gamma-aminobutyric acid) bought over the internet. Clin Toxicol. 2015;53(7):783–4. https://doi.org/10.3109/15563650.2015.1059944.
21.• Brunner E, Levy R. Case report of physiologic phenibut dependence treated with a phenobarbital taper in a patient being treated with buprenorphine. J Addict Med. 2017;11(3):239–40. https://doi.org/10.1097/ADM.0000000000000303 **A case of phenibut addiction is described, which is seldom published, and use of phenobarbital as a detoxification strategy is implemented with success.**
22. Magsalin RM, Khan AY. Withdrawal symptoms after Internet purchase of phenibut (beta-phenyl-gamma-aminobutyric acid HCl). J Clin Psychopharmacol. 2010;30(5):648–9. https://doi.org/10.1097/JCP.0b013e3181f057c8.
23.•• Samokhvalov AV, Paton-Gay CL, Balchand K, Rehm J. Phenibut dependence. BMJ Case Rep. 2013;2013:bcr2012008381. https://doi.org/10.1136/bcr-2012-008381 **The use of baclofen in the detoxification off phenibut is described here, and a several week tapering protocol with dosage recommendations is provided. This is only one of a few papers which provides clinical recommendations for managing phenibut discontinuation and withdrawal.**
24. Ahuja T, Mgbako O, Katzman C, Grossman A. Phenibut (beta-phenyl-gamma-aminobutyric acid) dependence and management of withdrawal: emerging nootropics of abuse. Case Rep Psychiatry. 2018;2018:9864285–3. https://doi.org/10.1155/2018/9864285.
25. El Zahran T, Schier J, Glidden E, Kieszak S, Law R, Bottei E, et al. Characteristics of tianeptine exposures reported to the National Poison Data System - United States, 2000-2017. MMWR Morb Mortal Wkly Rep. 2018;67(30):815–8. https://doi.org/10.15585/mmwr.mm6730a2.
26. Das S, Palappalllil DS, Purushothaman ST, Rajan V. An unusual case of baclofen abuse. Indian J Psychol Med. 2016;38(5):475–6. https://doi.org/10.4103/0253-7176.191383.
27. Ghosh S, Bhuyan D. Baclofen abuse due to its hypomanic effect in patients with alcohol dependence and comorbid major depressive disorder. Clin Psychopharmacol Neurosci. 2017;15(2):187–9. https://doi.org/10.9758/cpn.2017.15.2.187.
28. Hamel Senecal L, Chretien B, Jean-Jacques PY, Lelong Boulouard V, Cohen D, Le Boisselier R. A case of drug dependence syndrome to baclofen following high-dose therapy. J Clin Psychopharmacol. 2018;38(3):277–9. https://doi.org/10.1097/jcp.0000000000000886.
29. Turner S, Mota N, Bolton J, Sareen J. Self-medication with alcohol or drugs for mood and anxiety disorders: a narrative review of the epidemiological literature. Depress Anxiety. 2018;35(9):851–60. https://doi.org/10.1002/da.22771.