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Maryland Poison Center
UNIVERSITY OF MARYLAND SCHOOL OF PHARMACY
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The Maryland Poison Center's Monthly Update: News, Advances, Information

Dialysis of gabapentin and pregabalin

Gabapentin and pregabalin, collectively called the gabapentinoids, are approved for neuropathic pain, postherpetic neuralgia, fibromyalgia, adjunct therapy for focal seizures, and are also prescribed for migraine, restless leg syndromes, and other indications. Their structures resemble gamma aminobutyric acid (GABA). However, they have little or no activity on GABA receptors. Instead, they inhibit the alpha2-delta subunit of voltage-gated calcium channels, thus reducing presynaptic calcium influx, and reducing excitatory neurotransmitter releases such as glutamate and substance P (Am J Kidney Dis. 2022 Jan;79(1):88-104). The absorption of gabapentin decreases with increasing dose (Epilepsy Res. 1998 Jul;31(2):91-9). The bioavailability of pregabalin is independent of dose. Pregabalin is thought to be 2.5 times more potent than gabapentin and has a quicker absorption (Drugs. 2017 Mar;77(4):403-426). Both undergo little to no metabolism and are excreted in the urine unchanged. The elimination half-lives of gabapentin and pregabalin are 5-8 hours and 4-9 hours, respectively (Am J Kidney Dis. 2022 Jan;79(1):88-104). In patients with renal dysfunction, the half-life is prolonged and both gabapentin and pregabalin require dosage adjustment in impaired renal function. Poisoning may occur with intentional overdose or inadequate dose adjustment for decreased renal function.

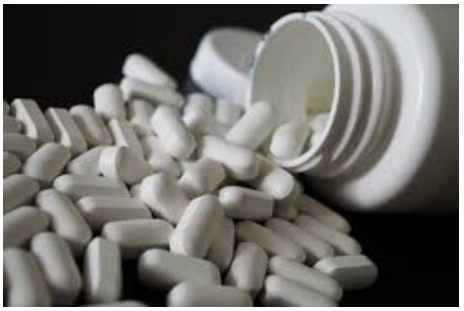
Symptoms of gabapentinoid poisoning include sedation, encephalopathy, ataxia, nystagmus, and GI distress. Severe toxicity may include profound CNS depression and respiratory depression requiring intubation. Treatment is primarily supportive.

Both gabapentin and pregabalin have small molecular weight, low protein-binding, and small volume of distribution, making them ideal candidates for extracorporeal treatment (ECTR) when necessary. Clinical data shows that approximately 30% of gabapentin is removed with a 2–4-hour session of hemodialysis (HD) in patients with renal impairment. One study showed a mean 55.6% removal of pregabalin with 4 hours of HD in patients with end-stage renal disease (ESRD) (J Clin Pharmacol. 2003 Mar;43(3):277-83).

The EXtracorporeal TReatments In Poisoning (EXTRIP) workgroup suggests ECTR in patients who are severely poisoned **and have coexisting kidney impairment**, especially in the presence of associated coma requiring mechanical ventilation (Am J Kidney Dis. 2022 Jan;79(1):88-104).

EXTRIP recommends intermittent HD over any other types of ECTR. It also recommends to terminate ECTR based on clinical improvement and to monitor patients for possible signs and symptoms of withdrawal. These recommendations are based on weak evidence. Conversely, patients with normal kidney function are unlikely to benefit from dialysis in the setting of gabapentinoid poisoning, as hemodialysis clearance of gabapentinoids is only slightly faster than normal urinary elimination of the drugs.

Contact your local poison center at 1-800-222-1222 for patient specific treatment recommendations for gabapentin and pregabalin poisoning.



Did you know?

Pregabalin and gabapentin might be drugs of abuse.

During pregabalin clinical trials, a small number of participants reported euphoria effects. It is a schedule V controlled substance in the U.S. Gabapentin can also be abused for euphoria and other reasons such as potentiating opioid effects, reproducing cocaine-like effects, reducing alcohol cravings, and promoting sedation and sleep (Am J Health Syst Pharm. 2021 Dec 24).

Gabapentin was the 15th most commonly prescribed medication in 2019, with a doubling of prescription volume between 2011 -2017 (Pharmacy Today. 2021;27(10):33). As of 2020, it is a schedule V in these states: Alabama, Kentucky, Michigan, North Dakota, Tennessee, Virginia, and West Virginia. Additional states have mandatory gabapentin prescription monitoring.

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