

Accidental peroral *Veratrum* tincture poisoning: A case report

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More than 200 alkaloids are found in *Veratrum* species that grow throughout the Northern Hemisphere and in *Zigadenus* species. Steroidal *Veratrum* alkaloids (protoveratrine) mainly belong to three classes: cevanine, jervanine and veratranine.

Sometimes in medical literature *Veratrum* alkaloids are confused with veratrine which is a mixture of alkaloids from the dried ripe seeds of *Schoenocaulon officinale* and resembles aconitine in its action.

Veratrum species are tall perennial herbs that grow up to 1.7 m in height. All parts of these plants are poisonous, the highest concentrations of alkaloids are in the rhizomes and roots (up to 1.5-2%).

V. album (figure 1), *V. nigrum* (figure 2) and *V. lobelianum* grow in Lithuania naturally and are cultivated as medicinal and decorative plants.

Common names: corn lily, earth gall, false hellebore, rattlesnake weed, skunk cabbage, swamp hellebore, tickle weed, weed pepper-root, etc.

Common Lithuanian names: *atgiris*, *čemerys*, *čemeryčia* [tʃemɛˈriːtʃə], *čiaudžolė* [tʃ`eudʒɔlə], etc.

Uses

Historically *Veratrum* species were used for different purposes, e.g. to poison arrows or for the treatment of hypertension, powder from dried roots was used as an insecticide against cockroaches. These plants are used in homeopathic remedies, too.

Veratrum tincture also called *Aqua Veratri* is a naturally based medication for external use only. The constituents of this medication are an ethanolic tincture from the rhizomes and roots of the *Veratrum* species (concentration of *Veratrum* alkaloids 0.065-0.085% in 70% ethanol). It is recommended to be used for the treatment of parasitic skin diseases such as pediculosis, scabies and fleas. In Lithuania accidental peroral poisonings occur because of a very similar packaging to cardiac drops (figure 3).

In folk medicine *Veratrum* extract and *Veratrum* tea are used as external medication for the pain and arthritis treatment and for a better growth of hair. Russian made *Veratrum* tea for the treatment of alcoholism can be found in black market (figure 4).

Veratrum species can be also ingested by mistake.

Toxic dose

Several millilitres of *Veratrum* tincture can cause symptoms, 1-2 g of the powdered rhizome can be lethal for adults.

Mechanism of toxicity

Veratrum alkaloids increase permeability of sodium channels of neurons and cause their depolarization. Very important effect is the stimulation of *n. vagus*, which results in bradycardia and hypotension.

Toxicokinetics

There are very few toxicokinetic data of *Veratrum* alkaloids in the literature. Oral absorption is good and quite rapid, onset of action is after 0.5-4 hours, sooner after the ingestion of tincture. Duration of poisoning is 1-2 days usually, but sometimes it can last longer, even up to two weeks, especially after consumption of the plant. Absorption from airways and dermal absorption are possible, too.

Symptoms of poisoning

Most common symptoms are vomiting, sinus bradycardia and hypotension. Initially poisoning begins from burning sensation of throat, nausea, vomiting, sometimes abdominal pain, followed by bradycardia and hypotension. There can be a lot of alterations in electrocardiogram (ECG): atrioventricular block, dysrhythmias, ST abnormalities, T wave inversions, QT prolongation, etc. Other symptoms include sweating, salivation, paresthesia, dyspnea, muscular weakness, headache, etc. Coma and seizures are common only for severe poisoning, death can occur for the reason of dysrhythmias.

There can be dilated pupils and blurred vision, also. Although there is very little information about disturbed colour perception, in older sources of information and in our practice we met cases of seeing surroundings in yellowish green colour.

Local contact can cause erythema, conjunctival irritation and lacrimation, sneezing.

Interactions

Substances, causing bradycardia and hypotension, can increase the toxicity of *Veratrum* alkaloids.

Treatment

Exposed areas of skin must be washed with soap and water, exposed eyes must be irrigated with copious tepid water or saline.

Gastric lavage usually is not necessary.

Single-dose activated charcoal (up to 4 hours after ingestion) is recommended if there is not significant vomiting 1-2 g/kg for children and 50-100 g for adults.

Enhanced elimination is not recommended.

There is no specific antidote.

Supportive care:

Intravenous injection of atropine for the bradycardia:

- 0.02 mg/kg (0.1-0.5 mg) for children and up to 1 mg for adolescents, injection may be repeated after 5 min.

- 0.5-1 mg every 3-5 min., if it is necessary, for adults (total dose 0.04 mg/kg).

Hypotension responds to intravenous fluids and atropine usually, if it is necessary, vasopressors (e.g. dopamine) can be used.

Prognosis

Most symptoms resolve during 24 hours if patients are treated correctly, in any case, patients should be observed at least 24 hours after recovery.

Case report

A 59 year old woman admitted at 6 a.m. in Emergency department of LUHS Hospital Kaunas Clinics and was hospitalized for observation. Her main complaints were general weakness, breathing difficulties, fingertips numbness. Case history: she felt discomfort in her chest and elevation of blood pressure early on that morning and asked her husband for cardiac drop medication. *Veratrum* tincture was taken by mistake because of very similar packaging. The nausea, vomiting and abdominal cramps appeared shortly after. She arrived to hospital approximately 2 hours post ingestion. Her clinical examination in admission was normal: she was conscious, felt weakness, heart rate (HR) rhythmical, 72/min., blood pressure (BP) 100/70 mmHg. ECG on admission revealed sinus rhythm and right bundle branch block (RBBB). Her clinical and biochemical blood tests were normal. She received an intravenous infusion of fluids and cardiovascular monitoring was started. Severe hypotension 70/40 mmHg and sinus bradycardia 44-45/min. developed 4 hours later (figure 5). A bolus of 0.5 mg atropine sulphate intravenously was given. The BP and HR rose to normal ranges (90/60 mmHg and 77/min. respectively). Cardiovascular monitoring was continued and the hypotension and bradycardia episode repeated 4.5 hours later. Repeated dose of atropine bolus was given intravenously. She underwent inpatient observation for more than 24 hours and no more episodes of cardiovascular disorders were observed. ECG findings: RBBB disappeared. The patient was discharged without any clinical, ECG and laboratory changes 30 hours post admission.

Conclusion

This case illustrates the possibility of delayed and repeated nature of cardiovascular disorders in *Veratrum* alkaloids poisoning and demonstrates the importance of prolonged cardiovascular monitoring in such poisonings.

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1 *Veratrum album* (de.wikipedia.org)



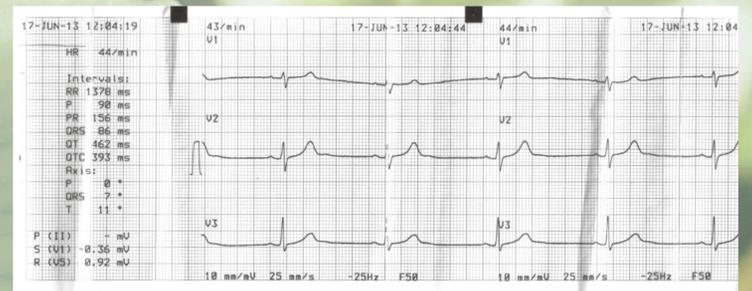
2 *Veratrum nigrum* flowers (pl.wikipedia.org)



3 Bottles of cardiac drops and *Veratrum* tincture



4 Russian made *Veratrum* tea for the treatment of alcoholism



5 ECG (sinus bradycardia)