



TOXTALKS

A BULLETIN FOR HEALTHCARE PROFESSIONALS WHO MANAGE POISONED PATIENTS

Blue Ridge Poison Center

University of Virginia Health

September 2020

OLEANDER AND COVID-19: TOXIN OR TREATMENT?

The global medical community has been racing to find effective treatments for the SARS-CoV-2 (COVID-19) virus. In July 2020, Phoenix Biotechnology began to promote oleandrin as potentially effective treatment for COVID-19 despite there being no published, peer-reviewed animal or human studies demonstrating the safety or efficacy of this proposed treatment. Many medical professionals immediately raised alarm, as oleandrin is a known lethal toxin.

What is oleandrin?

Oleandrin comes from the *Nerium oleander* (common oleander) and *Thevetia peruviana* (yellow oleander) plants. Both are used in the United States as decorative plants. All parts of the shrub (leaves, flowers, branches, stems, flowers, fruits, seeds, and roots) are toxic. They contain oleandrin which is a toxin categorized as a cardiac glycoside. Other notable cardiac glycoside toxins include digoxin, ouabain, and bufalin (a toxin in the *Bufo* toad).

What does the toxin do?

Oleandrin has the same mechanism of action as digoxin. It inhibits the sodium/potassium-ATPase pump in cardiac muscle cells. When inhibited, the cells are unable to extrude sodium, and potassium is unable to enter the cell. Consequently, the sodium concentration inside the cell increases, while the potassium level of the blood increases. The increased sodium level inside the cell inhibits the sodium-calcium antiporter, which prevents calcium from exiting the cell. As a result, the calcium level inside the cell increases. The greater calcium level in the cell increases the strength of cardiac contractility (positive inotropy). However, the increased calcium concentration can lead to cardiac arrhythmias. In addition, the elevated potassium level in the blood increases the risk for cardiac arrhythmias. Oleandrin also increases the

Continued next page

NEWS AND NOTES:



WELCOME to Dr. Aaron Frey, DO, the newest member of our clinical team. Dr. Frey is

beginning his two year fellowship in medical toxicology at University of Virginia Health. He graduated from the Edward Via School of Osteopathic Medicine and completed his residency at Lehigh Valley Health Network, Allentown, PA. Dr. Frey's professional interests include hazardous materials; chemical, biological, radiological, and nuclear agents; prehospital disaster response; and critical care. He enjoys mixed martial arts, hiking, history, and learning foreign languages. He is the author of this month's article on Oleander.

**Free. Fast. Expert help.
24 hours a day, 7 days a week.**



BRPC STAFF

Director

Christopher Holstege, MD

Nursing Director

Beth Mehring, MSN

Medical Toxicologists

Andy Baer, MD
 Heather Borek, MD
 Nathan Charlton, MD
 Justin Rizer, MD

Medical Toxicology Fellows

Aaron Frey, DO
 Avery Michienzi, DO
 Jennifer Ross, MD, MPH

Epidemiologist

Saumitra V. Rege, MS, PhD

Poison Specialists

Andre Berkin, BSN, CSPI
 Michael Brookshire, BSN, RN
 Jenni Goodwin, BSN, CSPI
 Jennifer Horn, BSN, CSPI
 Sue Kell, Ph.D, M.Ed, CSPI
 Teresa Kinzie, RN, CSPI
 Kathy Mayo, RN, CSPI
 Lisa Turner, RN, BSN
 Scott Wiley, BSN, CSPI
 Steven Yoder, BSN, CSPI

Public Health Educator

Kristin Wenger, MA, BS

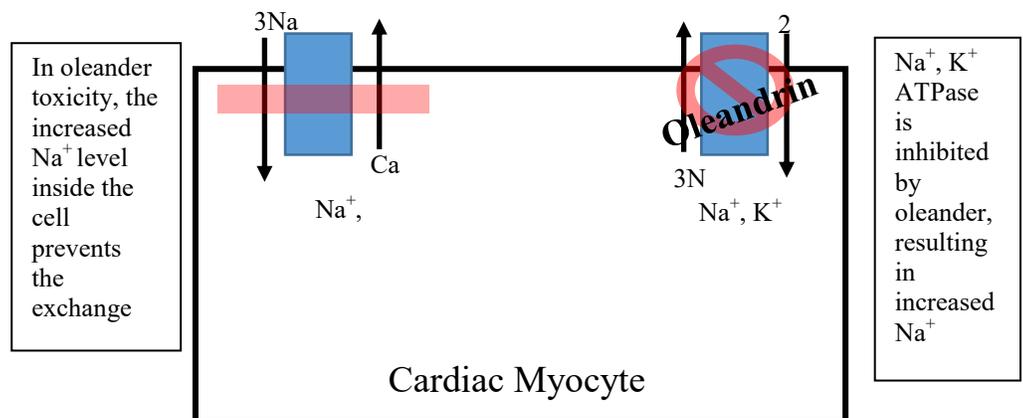
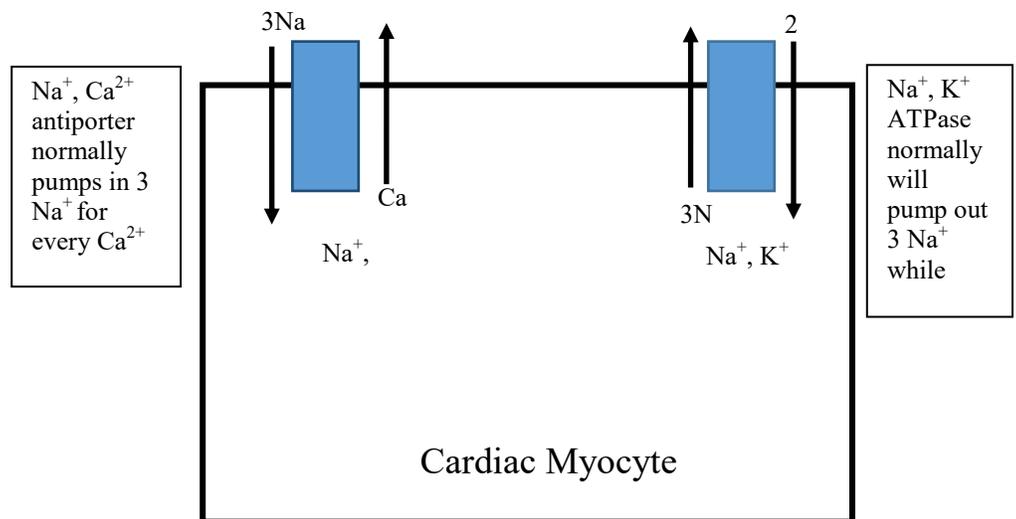
Administrative Specialists

Heather Collier
 Teresa Dorrier

parasympathetic innervation of the heart (vagal stimulation), which decreases the heart rate.

What are the symptoms of oleandrin toxicity?

When ingested, various symptoms can result, all of which mimic digoxin toxicity. There is usually nausea, vomiting, diarrhea, and abdominal upset. Patients are often bradycardic, but may have frequent premature ventricular contractions, junctional rhythms, or ventricular tachycardia. These cardiac manifestations can be lethal.



What is the treatment?

Treatment of poisoning requires hospital-based care. In addition to supportive care, specific treatments may be required if the patients has elevated potassium levels. Some may benefit from the administration of digoxin specific Fab fragments, which have the ability to bind the cardiac glycoside toxins.

What is the take away from this?

At this time there is insufficient evidence to support the use of oleandrin for the treatment of COVID-19. It is not recommended to use oleandrin in any formulation for the prevention or treatment of COVID-19 due to the risk of potentially lethal effects.



Oleander in bloom.
Photo courtesy of Dr. Heather Borek, Blue Ridge Poison Center

If questions arise on this or any other poisoning, the clinical staff at the Blue Ridge Poison Center would happy to assist. Free medical consult is available 24 hours a day, every day: 1-800-222-1222. (Healthcare providers may also call the dedicated HCP line: 1-800-451-1428).

The Blue Ridge Poison Center receives funding from University of Virginia Health, the Virginia Department of Health, and the U.S. Health Resources Services Administration (HRSA). We are accredited by the American Association of Poison Control Centers. We've been proudly serving the Commonwealth since 1978.

Poison safety tips, free materials, & more:

