

Digitalis and strophantine

Digitalis and strophanthin are plant alkaloids that belong to the group of cardiac glycosides. They are cardiotonics, have positively inotropic effects. Cardiotonics are substances that enhance cardiac activity. Cardiac glycosides are widely used in heart failure or cardiac arrhythmias. In clinical practice, digoxin is the most widely used.

Cardiac glycosides increase the penetration of calcium ions - they work similarly to adrenaline, but are independent of β -receptors. They bind to and inhibit the Na^+/K^+ -ATPase ion pump on the cardiac cell membrane, which increases the Na^+ concentration in the cell. At the same time, it reduces the efficiency of another ion pump, such as $\text{Na}^+/\text{Ca}^{2+}$ -ATPase, which pumps calcium ions out of the cell.



Digitalis purpurea

Digitalis

Digitalis is a plant cardioglycoside that is found in foxgloves (red foxglove or woolly foxglove). These flowers are quite often grown as ornamental flowers, which is highly dangerous to animals and children. Accidental poisonings are the most common.

Digitalis is used to produce digoxin, which is an antiarrhythmic - the therapeutic dose is up to 0.5 mg.

The lethal dose of digitalis is approximately 2.5 g. Intoxication occurs when the plant is ingested, only a few leaves should be enough to cause mild poisoning. The first symptoms do not appear until several hours later. Digitalis is absorbed very slowly, with a latency of 48 hours to several days. Digitalis is also slowly broken down and excreted, it has a cumulative effect.

Clinical signs of poisoning include bradycardia, arrhythmias, vomiting of central origin. Pulse, heart rate and respiration are irregular. The patient is observed drowsiness at other times insomnia, muscle weakness, visual disturbances, anxiety, cold sweat, anuria. Often there is irritation of the stomach wall, an increase in peristalsis, colic, diarrhea, nausea and vomiting occur. The patient may describe hallucinations and various psychoses. Death occurs within 24 hours.

Autopsy shows gastric catarrh, hyperaemia of the organs, and leaf particles with characteristic hairs may be found in the gastric and intestinal contents. In intoxication, the concentration of digoxin in the myocardium is up to 100 times higher than in the plasma.



Digitalis purpurea

Strophanthine

Strophanthin is a plant alkaloid that is found, for example, in liana. It is found mainly in tropical Africa and Asia.

Strophanthin is used by natives as an arrow poison. The ripe dried spindle-shaped seed is used as a drug. The effects are immediate. The lethal dose of strophanthine is over 1 mg.

Clinical symptoms of strophanthin poisoning include anxiety, inability to speak, pallor, sweat, diarrhea, vomiting, choking, weakening of the pulse, miosis or mydriasis, and unconsciousness.



Strophantus gratus

Links

Related articles

- arrhythmias
- cardiac glycosides
- digoxin

References

- ŠTEFAN, Jiří a Jiří HLADÍK, et al. *Soudní lékařství a jeho moderní trendy*. 1. vydání. Praha : Grada, 2012. ISBN 978-80-247-3594-8.
- PILIN, Alexander. *Soudní lékařství*. - vydání. Charles University in Prague, Karolinum Press, 2022. 480 s. ISBN 9788024650135.