K35 Scientific and Careful Setting Up of a Lethal Oleander Leaves Infusion

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Learning Overview: After attending this presentation, attendees will know more about determining suicidal death by poisoning through the autonomous preparation and drinking of a *Nerium oleander* leaves infusion.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing a complete evaluation of the forensic aspects of *Nerium oleander* self-poisoning, analyzing scene investigation, external body examination, autopsy findings, and toxicological and histological analysis.

Suicidal oleander poisoning is uncommon, although some cases are described in the literature.[1]

The uniqueness of this case lies specifically in what the scene investigation findings suggested, namely the scientificity of the act implemented by the man, a laboratory technician, who arranged everything in great detail and in a manner that shows the fully lucid and conscious intention of killing himself. The additional unique element, further supporting full awareness and thorough planning of the act, was the presence on the scene of warnings for "*Poison,*" showing concern for people approaching the scene after his death. Per research, this is the first report of suicide using an infusion of *Nerium oleander* leaves and the first time toxicological analyses have investigated the ratio of oleandrine concentrations in the vitreous humor versus the cardiac/peripheral blood and other biological samples.

Nerium oleander is an indoor and ornamental plant of an evergreen shrub, widespread in Mediterranean countries and one of the most poisonous plants known to humans. All parts are toxic. The effect is primarily due to the cardiac glycosides (oleandrin, nerin, digitoxigenin, and olinerin). Oleandrin is the principal toxin. Clinical manifestations of poisoning appear a few hours after intake and include gastrointestinal, central nervous system, and cardiovascular effects, characterized by nausea, vomiting, salivation, colic, diarrhea, ataxia, drowsiness, muscular tremor, ventricular tachycardia, dysrhythmia, and heart blockage. *Nerium oleander* poisoning can be accidental, homicidal, or suicidal.[2]

Reported here is the case of a suicidal poisoning of a 71-year-old man, which occurred in Castellana Grotte (BA) in March 2019. The scene investigation (the man's house) revealed the presence of a steel pan, with its cover on, sealed with packing tape.

A small piece of white Scotch® tape was on the cover, with a note in pen on it: *Poison. Wash pan and funnel carefully or throw everything away.* Inside the pan, elongated dark green leaves, small trunks, and a plastic funnel were found. A smaller pan and a bottle were also present on the scene, both containing a golden yellow fluid. A piece of white Scotch® tape was also present on the bottle, with the following note: *Poison.* An empty glass was also located at the scene.

The external examination performed on the man's body revealed blood percolation from respiratory orifices. No other significant findings were encountered.

The autopsy findings showed multi-organ congestion, as is common in cases of oleander poisoning.[3] Moderate congestion was present in the kidneys, liver, brain, and lungs. The lungs also showed some indications of hemorrhagic suffusion. Stomach content showed the presence of a brown liquid (0.5cc). The bowel was resected with absence of the distal portion of the small intestine and the right part of the large one, as the man had been previously operated for cecum carcinoma.

The histological examination of the tissues corroborated edema of the kidneys, liver, brain, and lungs with some indications of hemorrhagic infiltration in the latter, as macroscopically observed. No other abnormalities were revealed.

Toxicological investigations performed by Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) on the samples collected during the autopsy (blood, urine, gastric content, vitreous humor, liver) confirmed the presence of toxic levels of oleandrin in all specimens.[4] In detail, the results of oleandrin quantification were: blood 37.5ng/ml; vitreous humor 12.6ng/ml; urine 83.8ng/ml; liver 205ng/mg; and gastric content 31.2µg/ml. Oleandrin was also present into the yellow liquid found at the scene, in a concentration of 38.5µg/ml. Hence, the diagnosis of self-poisoning through the ingestion of an infusion of oleander leaves.

This case is a good illustration of the overall set of forensic aspects relating to self poisoning by means of an infusion of the oleander leaves, with the added detail of the meticulous planning of the suicide.

Reference(s):

1. Azzalini E., Bernini M., Vezzoli S., Antonietti A., Verzeletti A. A fatal case of self-poisoning through the ingestion of oleander leaves. *J Forensic Leg Med*. 2019 Jul; 65:133-136.
2. Julia Radenkova-Saeva, P. Atanasov. Cardiac Glycoside Plants Self-Poisoning. *Acta Medica Bulgarica*. 2014 November; DOI: 10.2478/amb-2014-0013.
3. Seneviratne, S.L.; de Silva, C.E.; Fonseka, M.M.D.; Gunatilake, S.B.; de Silva, H.J. Post mortem findings in yellow oleander poisoning. *Sri Lanka Medical Association*, 21-24 March 2001.
4. Işıl Bavunoğlu, Musa Balta, Zeynep Türkmen; Oleander Poisoning as an Example of Self-Medication Attempt; *Balkan Med J*. 2016 Sep; 33(5): 559–562.

Toxicology, Oleander Leaves Infusion, Fatal Intoxication

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