

Case Report

Fatal Poisoning in Man due to Oral Use of *Nerium Oleander* for Medicinal Purpose

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Abstract

Oleander is a part of the most poisonous of commonly grown garden plants. *Nerium oleander* has been used traditionally by herbalists as a remedy for a wide variety of maladies and conditions. Sometimes it may be toxic to humans. However, very few toxic cases in humans have been reported. In present case a 65 year old man having a history of hemiparesis consumed a cupful (approx 100ml) of the 'kada' for alleged curing of his ailment. 'Kada' was a decoction of White 'kaner', (white oleander) leaves. After its consumption he developed unconsciousness, coma and finally was brought in dead on reaching hospital. The present case is reported for its rarity and fatality when the 'Kada', is used orally for medicinal purpose.

Keywords: *Nerium Oleander*; Poisoning; Medicinal purpose; Oral; Man

Introduction

Nerium Oleander is an evergreen shrub or small tree in the dogbane family Apocynaceae, toxic in all its parts. It is the only species currently classified in the genus *Nerium*. It is generally known as oleander, from its superficial resemblance to the unrelated olive *Olea*. It is so widely cultivated that no specific region of origin has been determined, although southwest Asia has been included. Oleander is part of the most poisonous of commonly grown garden plants [1] (Figure 1).

Nerium oleander contains compounds such as oleandrin and oleandrogenin, known as cardiac glycosides, which are known to have a narrow therapeutic index and can be toxic when ingested [2]. The present case is reported for its rarity and fatality when the 'Kada', i.e. decoction is used orally for medicinal purpose.

Case History

A 65 year old man had a history of hemiparesis since 6 months. The deceased was a farmer with known history of hypertension. He was a chronic smoker and chronic tobacco chewer. While at farm one afternoon, he had a sudden history of headache leading to hemiparesis. He did not take any medication even after this episode and relied on local herbal medicines. For alleged curing of his ailment he prepared 'Kada' i.e. decoction of White 'kaner', (white oleander) leaves. He

consumed a cupful (approx 100ml) of the 'kada'. After which he had vomiting, diarrhea, faintness, and delirium. He was brought to a local doctor for treatment who referred him immediately to our tertiary health centre on same day. On arrival to our tertiary health centre, he was reported to have been brought in dead by the attending doctor.



Figure 1: *Nerium oleander* flower and leaves.

On Autopsy

On external examination, the victim was thin and was wearing traditional Indian attire of kurta and dhoti. There was oozing of blood from nostrils. Cyanosis of fingernail, and lips was seen. On internal examination, there was congestion of the brain with focal subarachnoid hemorrhage present. Heart showed congestion with hypertrophy of left ventricle. Coronaries were patent. The oesophageal mucosa showed congestion with a purplish hue. Lung was congested, oedematous with interparenchymal petechial hemorrhages. The stomach contained about 100 cc brownish reddish fluid. The stomach and intestinal mucosa showed congestion, with hemorrhagic areas and gastritis. There was evidence oedema of glottis. All other visceral were intact and congested.

Microscopic examination of the lungs showed features of pneumonitis. Kidneys showed features of acute tubular necrosis. Liver showed periportal inflammatory infiltrates while the heart and spleen showed congestion. Cerebrum showed congestion with inflammatory infiltrate. There was evidence of glottis oedema.

The toxicological analysis did not reveal any toxic substance. Death was attributed to accidental poisoning secondary to consumption of oleander 'kada' (Figure 2-5).

Discussion

Despite the common "poisonous" designation of this plant, very few toxic cases in humans have been reported. Toxicity studies of animals administered oleander extract concluded that the rodent and avian species were relatively insensitive to oleander cardiac glycosides [3]. Other mammals, such as dogs and humans, were quite sensitive to the effects of cardiac glycosides and the clinical manifestations of "glycoside intoxication"[3-5]. However, study by Omidi et al. [6] states

that chickens appear to respond to oleander poisoning in a manner similar to other species.



Figure 2: Oozing of blood from nostril in case of nerium oleander poisoning.



Figure 3: Focal subarachnoid hemorrhage in case of nerium oleander poisoning.



Figure 4: Heart showing congestion with hypertrophy of left ventricle.

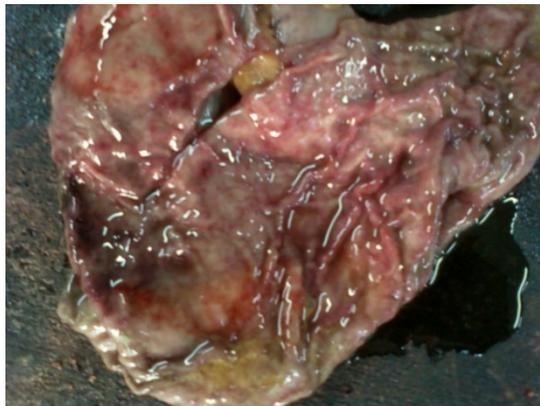


Figure 5: The stomach mucosa showing congestion, with hemorrhagic areas and gastritis.

According to the Toxic Exposure Surveillance System (TESS) in 2002 there were 847 human exposures to Oleander reported to poison centers in the United States [7]. Only three deaths were recorded in the existing literature. One death was caused by the ingestion of oleander leaves by a diabetic man. The total blood concentration of cardiac glycosides was about 20 µg/L, which was well above the reported fatal level [8]. Another reported death was of a woman who self-administered "undefined oleander extract" both orally and rectally and her oleandrin tissue level was 10 to 39 µg/g which was in the high range of reported levels at autopsy [9]. And, the last reported death was of a woman who ingested Oleander 'tea' [10].

There was no toxicity or deaths reported from topical administration of Nerium oleander or specific products derived from them. Human mortality associated with oleander ingestion is generally very low, even in cases of moderate intentional consumption [11]. The deceased of this case ingested the decoction of oleander leaves.

All the previous studies indicate that either administration of *Nerium oleander* extracts as a parenteral or topical preparation is safe when doses anticipated for commercial products are applied [12]. Toxicity studies that have been conducted in dogs and rodents administered oleander extracts by intramuscular (IM) injection indicated that on an equivalent weight basis, doses of an oleander extract with glycosides 10-times in excess of those likely to be administered therapeutically to humans are still safe and without any "severe toxicity observed" [12]. Unfortunately, on toxicological analysis no toxic concentration of *Nerium oleander* was detected. However, this may be explained by the lack of facilities for detection of such toxin in our laboratories.

A study in which concentrated extract of *Nerium oleander* (containing oleandrin and other cardiac glycosides) was administered orally to humans for cancer treatment, concluded that it was "well tolerated up to the 10.2 mg extract/day dosage" with few significant side effects and with evidence of tumor response. Both animal and human studies indicate that dermal application of *Nerium oleander* extract is safe [13].

Nerium oleander has been used traditionally by herbalists as a remedy for a wide variety of maladies and conditions, including dermatitis, abscesses, eczema, psoriasis, sores, warts, corns, ringworm, scabies, herpes, skin cancer, asthma, dysmenorrheal, epilepsy, malaria,

abortifacients, emetics, heart tonics, and tumors. Macerated leaves of oleander have been applied topically for treatment of dermatitis, loss of hair, superficial tumors and syphilis. A decoction of oleander leaves has been used in the treatment of gingivitis and as a nose drop for children [14]. In the present case the deceased was suffering from a chronic disorder of hemiparesis for which he ingested 'kada' i.e. decoction of nerium oleander leaves for allege cure.

The cardiac glycosides are well known for increase cardiac contractility and have been traditionally used for treatment of congestive heart failure [12]. Reactions to ingestion of this plant can include both gastrointestinal and cardiac effects. The gastrointestinal effects can consist of nausea and vomiting, excess salivation, abdominal pain, diarrhea that may or may not contain blood [15]. Cardiac reactions consist of an irregular heart rate, sometimes characterized by a racing heart at first that then slows to below normal further along in the reaction. The heart may also beat erratically with no sign of a specific rhythm. Extremities may become pale and cold owing to poor or irregular circulation. Reactions to poisonings from this plant can affect the central nervous system. These symptoms can include drowsiness, tremors or shaking of the muscles, seizures, collapse, and even coma that can lead to death [12]. Oleander sap can cause skin irritations, severe eye inflammation and irritation, and allergic reactions were characterized by dermatitis [16]. On autopsy, we found congestion and hemorrhagic areas in gastric mucosa suggestive of gastric irritation caused by oral consumption of the 'kada' of oleander leaves. In addition, there was a subarachnoid hemorrhage, which may have led to drowsiness, tremors, seizures, collapse, and coma resulting in death of the deceased in this case. The cyanosis may be due to irregular or poor circulation caused by cardiac reaction as mentioned above.

Poisoning and reactions to oleander plants are evident quickly, requiring urgent medical care in suspected or known poisonings of both humans and animals [16,17]. Induced vomiting and gastric lavage are protective measures to reduce absorption of the toxic compounds. Charcoal may also be given to help absorb any remaining toxins [15]. Further medical attentions may be required and will depend on the severity of the poisoning and symptoms.

Drying of plant materials does not eliminate the toxins. It is also hazardous for animals such as sheep, horses, cattle and other grazing animals, with as little as 100g being sufficient to kill an adult horse [18]. When encountering a plant with this appearance one should exercise great care and caution to avoid ingestion of any part of the plant, including its sap and dried leaves or twigs. Dried or fresh branches should not be used for spearing food, for preparing a cooking fire, or as a medicine without its knowledge. Thus, the present case highlights the importance of knowing the fatality in cases of ingestion of 'kada' of nerium oleander and that too for medicinal purpose.

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