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FATAL GLORIOSA SUPERBA POISONING – A CASE REPORT

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ABSTRACT

Gloriosa superba also known as glory lily is grown for its medicinal value in various parts of Asia. The incidence of this plant poisoning is relatively rare. All parts of the plant, especially its tubers are considered to be highly poisonous. Toxic effect of this plant is due to the presence of an active alkaloid namely, Colchicine. Colchicine has a selective action on the tissues with high mitotic activity and it inhibits microtubule polymerization. We herein report a case of a 35 year old female who died as a result of acute respiratory distress syndrome and sustained multiple organ dysfunction following ingestion of tubers of *Gloriosa superba*.

Keywords: colchicine, acute respiratory distress syndrome, multiple organ dysfunction.

INTRODUCTION

Gloriosa superba is Zimbabwe's national flower. It is a native inhabitant of tropical Africa but now it is found to grow naturally in many countries of tropical Asia, including Bangladesh, India, Sri Lanka, Malaysia and Myanmar¹ and is one of the utmost important medicinal plants². *Gloriosa superba* is the state flower of Tamil Nadu³. *Gloriosa* derives its name from the Latin word 'gloriosus', which means handsome and *superba* from the word 'superb' means splendid or majestic⁴. *Gloriosa superba* Linn (Colchicaceae) also known as the Malabar glory lily, or "kembangtelang" (Java, Indonesia) is a perennial tuberous climbing herb, with extensive distribution in the tropical and sub-tropical parts of India, including the foothills of Himalayas⁵. It is also known by various indigenous names in states of India, like in Hindi as karihari, languli; In English, Glory lily, tiger claw flower; In Kanada as gowrihoo, akkutangiballi; In Sanskrit, langali, visalya; In Tamil, kalappaikillanku, senganthal poo and as nabhikkodi⁶.

Gloriosa superba is a semi-woody herbaceous branched climber, reaching just about five

meters in height¹. One to four stems arise from a single V-shaped fleshy cylindrical tuber. It is an imperative medicinal plant, all parts of the plant are used in the field of medicine particularly in Ayurvedic and Yunani systems. According to Ayurveda, the tuber is pungent, bitter and acrid, it has a role in curing inflammatory conditions, abdominal pain and also used as a laxative. The plant contains two important alkaloids namely, colchicine and colchicoside and the leaves are used to treat cancer related diseases and various other morbid conditions like ulcers, piles, and scrofula⁷. The white flour prepared from the tubers is bitter and is given with honey in treating conditions like gonorrhoea, leprosy, colic and intestinal worm manifestations. Its warm poultice is locally applied in rheumatism and neuralgic pain⁸. Medicinally, the tuber is used as an abortifacient, and in low doses, it exhibits a tonic action with anthelmintic property. The seeds are highly priced in the world market as a source of colchicine, a chemical that has been used as a remedy against gout, a metabolic disorder caused by the deposition of uric acid within the joints.

Although the plant is known for its medicinal values, the toxicity of this herb cannot be disproved. This case is worth reporting for the reason that of its rarity in occurrence as *Gloriosa superba* poisoning.

CASE REPORT

A female aged 35 years was brought to our tertiary care hospital with the complaints of vomiting, numbness of the mouth, burning sensation and dryness of the throat. On admission, her vitals were found to be stable and her biochemical investigations were within normal limits. Within 2 hours of admission, she developed symptoms of bloody diarrhoea and dehydration. Her blood pressure was 100/70 mm Hg, pulse rate was 112/minute and the respiratory rate was 20/minute. Gastric lavage followed by symptomatic and supportive treatment was given. After 24 hours of admission, serum urea and creatinine levels were found to be markedly elevated (urea: 70 mg/dl, creatinine: 3.5mg/dl) and her gastrointestinal symptoms worsened. The patient ultimately died due to shock and multi organ failure after 30 hours of hospitalization, where the clinical cause of death was attributed as due to multiple organ failure and acute respiratory distress syndrome. History revealed that she had consumed 3 to 5 tubers of an unknown plant poison due to intolerable stomach pain and the attendants of the deceased were asked to bring the samples of the plant that disclosed to be *Gloriosa superba*. The body was kept in a cold chamber and an autopsy was conducted the next day. The deceased was an average built female without any external injuries. Internal examination revealed inflammation and multiple hemorrhagic petechial spots on the wall of the stomach and intestines. Liver and spleen were enlarged and congested, small intestine and colon were distended and multiple petechial hemorrhages were also observed throughout the fatty and subserosal tissues. Also numerous discrete petechial hemorrhages were found over the surface of the lungs, kidneys and base of the heart. The organs and blood

were preserved, and sent for toxicological and histopathological analysis, but the plant poison could not be detected by general toxicological screening. Histopathological examination of liver and kidney revealed features of congestion. No other significant abnormalities were noted.

DISCUSSION

The incidence of poisoning in India ranks the highest in the world, and it is estimated that more than 50,000 people die every year from toxic exposure⁹. Suicide in India is more common, as poison can be easily obtained and various poisonous plants have a wild growth of distribution, eg. *datura*, *oleanders*, *aconite*, *nux vomica*, etc. There are more than 4000 species of medicinal plants growing as herbs, shrubs, and trees in India, many of which are poisonous when administered in large doses¹⁰. The *Gloriosa superba* has been used for suicidal purposes in India, Burma and Eastern Africa^{11, 12}. It has diverse medicinal applications and eventually due to over-exploitation, this plant is facing local extinction. The colchicine, which is a major component of *Gloriosa* is mainly liable for its toxic effects. Gastroenteritis is the commonest clinical presentation of poisoning with colchicine. The most consistent feature is severe vomiting and diarrhea causing fluid loss high enough to produce hypotension, which is seen with the case reported here.

All parts of this plant, especially the roots are highly poisonous. The active principle constituents include highly active alkaloids like Colchicine, Gloriosine, Superbrine (a glycoside), Chelidonic acid and Salicylic acid. The toxins present within the plant have an inhibitory action on cell division, and depressant action on the bone marrow. Colchicine acts by inhibiting the polymerization of microtubules, by binding to tubulin, a major constituent of microtubules. The process of mitosis is inhibited due to non-availability of tubulin, thereby colchicine effectively functions as a mitotic spindle inhibitor. Apart from its antimitotic activity, it

also blocks the motility of neutrophils leading on to an anti-inflammatory effect. The lethal dose is about 60 mg in adults and the fatal period is about 12 to 72 hours¹³. Symptoms of poisoning develop within two hours of ingestion of the tubers. Victims present with vomiting, numbness, severe burning throat pain as well as diarrhea leading on to dehydration. Alopecia and dermatitis are the major late toxic effects of the plant poisoning. Colchicine poisoning following ingestion of *Gloriosa superba* tubers have been reported by various investigators¹⁴⁻¹⁶. Mendis¹¹ reported various toxic effects of the plant in the form of gastroenteritis, acute renal failure, cardiotoxicity and hematological abnormalities. In a study, there were eight deaths reported as due to *Gloriosa superba*, in which the gastrointestinal symptoms along with sweating, hypotension, jaundice and convulsions were noticed after its consumption¹⁷.

CONCLUSION

A literature survey shows that *Gloriosa superba* has been widely used for curing asthma, intermittent fever, leprosy, gout, rheumatism, piles, paralysis and many other ailments. Awareness among the local community is essential in preventing the poisoning of this plant. For this, various activities like poster presentation, mass campaigns, educational pamphlets and slogans must be carried out. The important aspects by which the person can be prevented from the toxic effects includes a high degree of suspicion of poisoning, accurate history, early recognition of its life threatening toxicity and prompt treatment. Consequently, we would like to point out that besides the already well known commonly practiced suicidal methods such as burning, insecticide consumption, hanging etc., in the daily practice, we face unexpected ways of poisoning that can pose a real diagnostic challenge to the forensic expert.

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Figure 1 – *Gloriosa superba*