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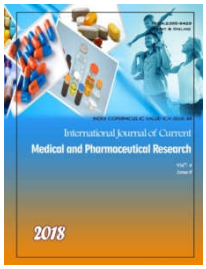

OUTCOME OF GLORIOSA SUPERBA POISONING

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ABSTRACT

Background: The prevalence of Gloriosa superba poisoning is highest in South Eastern Asia and Southern parts in Tamil Nadu where it is one of the frequent causes of death in plant poisonings especially its tubers.
Aim: To study the outcome of Gloriosa superba with regard to survival and hospital stay.
Methods: Patients with history and evidence of consumption of Gloriosa superb poisoning were included while those discharged against medical advice were excluded from the study. Patients were managed symptomatically and supportively according to Annamalai University - Rajah Muthiah Medical College and Hospital protocol. Parameters like age, sex, onset time, severity on admission, presenting time after consumption of poison to hospital, consumed with or without mixing with other substances, progression of severity, complications met during treatment, duration of ventilator requirement (if intubated), ICU stay and in hospital stay, condition at discharge, expenditure for treatment and mortality were studied.
Results: On observing the duration of ventilator requirement, ICU stay and in hospital stay it was found that an average of 10 days was required for mechanical ventilation with a range of 8 to 12 days, ICU stay with a an average of 13 days was required with range of 6 to 20 days and an total stay in the hospital with an average 16 days was required which ranges from 8 to 24 days. Among the thirteen patients, those who presented to hospital early and with fewer tubers consumed showed early recovery, decreased complication and duration of hospital stay. Those patients presented late to hospital developed few complications and showed delay in recovery and increased duration of hospitalization including ICU stay. No mortality was found during this study. All patients were discharged with complete recovery. The approximate expenditure in rupees for each patient ranged from 15,000 to 30,000.
Conclusion: The survival of Gloriosa superba poisoning is as high as 100%, when presented within 12 hrs to hospital and early aggressive management was initiated in the Emergency room.

INTRODUCTION

Gloriosa is a genus of five species in the plant family colchicaceae from tropical Africa and Asia (1). The most common English names are flame lily, fire lily, gloriosa lily, superb lily, climbing lily and creeping lily. They have showy flowers, distinctive because of their pronouncedly reflex petals, like a Turk's cap lily, ranging in colour from a greenish-yellow through yellow, orange, red and sometimes even a deep pinkish-red. Their native range is Africa, Southeastern Asia and parts of Malaysia, but they are now widely cultivated. It can be grown throughout the tropical India from the Northwest Himalayas to Assam and the Deccan peninsula.

In India, the herb is largely cultivated in Tamil Nadu particularly in Karur and Moolanur region. Various preparations of the plant are used in traditional medicines for a variety of complaints in both Africa and India. *Gloriosa superba* is the national flower of Zimbabwe. It is also the state flower of Tamil Nadu.

The juice from the leaves has been used for poisoned arrows by some African tribes and the gorgeous flowers are used in religious ceremonies. Juice from the leaves kills lice. This is also used as a cure for snake bites and scorpion stings. Crushed roots are used in water as a cure for baldness; the tuber is used for bruises and sprains and to cure colic, chronic ulcers, cancers, impotence and leprosy in parts of Africa. In traditional Ayurvedic medicine, the plant is used as a remedy for stomach pains, inflammations & itching. All parts of plants, especially the tubers are extremely poisonous. The tuber of the glory lily contain about 0.02-0.3% colchicine. (About l0gm fresh tubers contain 6mg of colchicine. FATALDOSE-0.8mg/kg.

***Aim*:** To study the outcome of *Gloriosa superba* with regard to survival and hospital stay.

METHOD: It's a prospective observational study done from October 2014 to January 2017. All patients with history and evidence of consumption of *Gloriosa Superba* poisoning were

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included in the study. Patients discharged against medical advice were excluded from the study. All patients were managed according to Annamalai University – Rajah Muthiah Medical College & Hospital protocol. AII patients were stabilized in emergency room and when ever needed airway was protected and mechanically ventilated. All patients were given gastric lavage and no cathartics were used, as the poisoning is characterized by spontaneous diarrohea. Parameters like sugar levels. Complete hemogram, Arterial blood gas, Electrocardiogram, Electrolytes, Renal function test, Liver function test, Enzymes such as CKMB, Troponin, Amylase were ordered on admission and when ever needed or at regular intervals and corrected appropriately. Urine output monitored closely. Adequate rehydration was maintained with plenty of intravenous fluids (2). Hemorrhagic manifestations were treated with vitamin K and blood components. Arrythmias were treated as per ACLS protocol. Fever was treated symptomatically. Fever is not a specific sign of infection because colchicine intoxication produces elevated temperatures (3). Nutrition requirement was calculated appropriately and supplemented with high proteins. Other complications during treatment were managed appropriately. All the patients were taken care of supportive measures like bed sore prevention, nosocomial infections prevention, deep venous thrombosis prophylaxis, stress ulcer prophylaxis, oralhygiene, fluids and electrolytes, physiotherapy. They were followed up until discharge.

Parameters like age, sex, time of consumption of poison, Presenting time to hospital, severity on admission, progression of severity, complications met during treatment, duration of ventilator requirement (if intubated), duration of ICU stay, duration of in hospital stay, condition at the time of discharge, expenditure for treatment and mortality were collected. Presenting time to hospital was taken as time Interval between consumption of poison and presenting to hospital, severity on admission was scored as per classification of severity of *Gloriosa superba* poisoning, duration of ventilator requirement considered from the day of initiation of ventilation to till weaning from ventilator, condition at the time of discharge was considered as recovered completely when the patient does not have any residual problem at the time of discharge and considered as improved when the patient is weaned from ventilator but have some weakness at the time of discharge. Severity of poison was graded according to signs and symptoms developed following admission to grade I, II, III. (4,5). Patients with Gl tract involvements alone like nausea, vomiting, anorexia, abdominal pain, diarrhea, pancreatitis, liver dysfunction, electrolyte imbalance and hypovolemia were considered grade I.

Patients presenting with multi system involvement like cardiogenic shock, ARDS, pulmonary edema, muscle weakness, respiratory depression, hypoxia, hypotension and myoglobinuria neurological signs and symptoms like confusion, delirium, papilledema, seizures, cerebral edema, coma, polyneuropathy and renal symptoms like dysuria, hematuria, proteinuria, renal failure, hematologic manifestations like severe leukopenia, thrombocytopenia, decreased fibrinogen, prolonged coagulation profiles, bone marrow suppression were categorized as grade II (1,5,6). Grade III is the recovery phase and the patients used to have rebound leukocytosis, alopecia, neuropathy- muscle weakness persisting for few years, myopathy persisting for 3 months, and fever persisting for several weeks but rarely exceeds 102°F (3,6).

Total expenditure includes money spent for drugs, Investigation in our medical college. All data were compiled into Microsoft Excel 2017 spread sheet and statistical analysis was accomplished using statistical method for calculations provided within "Statistical package for social science" software [versionll.5]. The range, mean and standard deviation were calculated for the studied parameters.

RESULTS

A total of 13 patients were diagnosed to have been consumed *Gloriosa superba* Poison, of which 38.46% were male and 61, 53% were female. The mean age was 39.69 years. The time of presentation (time between consumption of poison and appearance to hospital) ranged from 5.84 hours. Most of the patients presented with grade 1 severity and rarely grade II.

The presenting symptoms and it frequency were listed out in table 2. Among these thirteen patients, two patients (15.38%) underwent intubation and required mechanical ventilation for 8 and 12 days respectively, discharged from hospital after two weeks of hospital stay. One patient (7.69%) developed occasional ventricular premature contraction; another patient (7.69%) showed T wave inversion with increase in CKMB levels. On patient (7.69%) had hyponatremia; One Patient (7.69% developed hypokalemia.

S. No	1	2	3	4	5	6	7	8	9	10	11	12	13
Age	44	29	56	18	38	4S	36	64	22	24	53	48	39
Sex	M	F	M	F	F	F	M	M	F	M	F	F	F
Time of presentation	4 hrs	9 hrs	7 hrs	5hrs	8 hrs	10 hrs	2 hrs	6 hrs	4 hrs	3 hrs	5 hrs	12 hrs	1hrs
No ofseeds	5	8	10	6	8	12	7	9	4	8	6	8	4
Abdominal pain	no	No	Yes	<10	yes	NO	no	Yes	no	no	yes	no	No
Vomiting	yes	Yes	Yes	yes	no	Yes	no	Yes	no	Yes	NO	yes	No
Loose stools	no	No	Yes	no	no	Yes	no	No	no	yes	No	yes	No
Giddiness	no	NO	NO	no	no	No	no	No	no	no	No	yes	No
Chest pain	no	No	No	no	no	No	no	No	no	no	yes	yes	No
Dyspnoea	no	No	No	no	no	Yes	no	Yes	no	no	No	yes	No
Intubation	no	No	Yes	no	no	Yes	no	NO	no	no	No	no	No
CBG	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
ECG	WNL	WNL	WNL	WNL	Occ.Vpc's	WNL	WNL	WNL	WNL	WNL	WNL	T inversion	WNL
ABG	(N)	(N)	(N)	(N)	(N)	Met.acidosis	(N)	(N)	(N)	(N)	(N)	Met.acidosis	(N)
CBC	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
Electrolytes	(N)	(N)	Hyponatremia	(N)	hypokalemia	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
Urea	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
Creatinine	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
Lft	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
Ckmb	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	increased	(N)
Duration of hospital stay	9 days	17days	20 days	12days	14 days	24 days	10 days	15 days	9 days	10days	13 days	15 days	8 days
Prognosis	good	Good	Good	Good	good	Good	good	Good	good	good	good	good	good

S.no	Symptoms	Frequency (n)	Percentage (%)
1.	VOMITING	8	61.53
2.	ABDOMINAL PAIN	4	30.76
3.	LOOSE STOOLS	4	30.76
4.	DYSPNOEA	3	23.07
5.	CHEST PAIN	2	15.38
6.	GIDDINESS	1	7.69
7.	NO Symptom	1	7.69

Symptoms of Gloriosa superba Poisoning

An average of 13 days was required in ICU stay with a range of 6 to 20 days and an average 16 days was required for total stay in the hospital until discharge with a range of 8 to 24 days. Most of the studied patients developed complication. The complications were acute respiratory distress syndrome, nosocomial infections, respiratory failure, electrolyte imbalance, ICU psychosis, cardiac arrhythmias.

Among the thirteen patients, those patients who presented to hospital early and with less seeds consumed showed early recovery, less complication and decreased duration of hospital stay. Those patients presented late to hospital developed complications, delay in recovery and increased duration of hospital stay including ICU stay. No mortality found during this study. All patients were discharged with complete recovery. Two (15.38%) patients developed muscle weakness, recovered completely following conservative management. Approximate expenditure of each patient ranged from Rs.15,000 to Rs. 30,000 with a mean of Rs.22,500.

DISCUSSION

The incidence of *Gloriosa superba* poisoning is found to be more prevalent in the lower socioeconomic group. Among the plant poisonings the incidence is approximately around 11%. Both male and female predominance is observed in all age groups exposed to consumption of poison. The time of consumption of poison and presenting to the hospital decides the prognosis, hospital stay.

Colchicine produces gastrointestinal dysfunction leading to significant water loss and sequestration of fluid. The probable mechanism of toxicity is neurogenic rather than direct irritation. Although depressed myocardial function occurs in patients with normal right-sided filling pressures hypotension probably results from hypovolemia (1), Almost all patients developed GI symptoms within 2-6 hours of ingestion. Occasionally patients had bloody stools or hematemesis. Volume depletion, electrolyte imbalance and hypotension may occur. Life threatening complications often develop 24 - 72 Hours after ingestion. Respiratory insufficiency may op from multi-organ failure, pancreatitis, sepsis, muscle weakness or ARDS. Sudden cardiac arrests have been reported between 36 and 54 hours after ingestion and deaths were secondary to cardiogenic shock within 72 hours (l).

But none of our cases except one had cardiac complication. The one who had cardiac complications had his CKMB raised and had T inversion, which responded to supportive treatment. Electrolyte abnormalities were reported during various stages of poisonings includes hypocalcaemia, hyponatremia hypokalemia, hypophosphatemia, hyperkalemia (rare) (7) in our study we had one hyponatremia and one hypokalemia which were treated medically.

Also patients are reported to havehyper - bilirubinemia, hyper amylasemia, elevated hepatic aminotranferases, thrombocytopenia and leucopenia, but none of our cases had any such complications. Two cases of metabolic acidosis were seen which were secondary to hypovolemia or shock and responded to hydration. Rhabdomyolysis and myoglobinuria, during acute poisoning were reported but were not seen in our patients.

Various complications were noticed during the course of the treatment and were managed accordingly. The outcome based on the severity at the time of presentation was remarkable with aggressive emergency and efficient critical care management; we found a successful outcome in *Gloriosa superba* poisoning patients. Follow up of these patients revealed that they were back to routine life.lt was observed that the earlier the presentation, faster was the outcome and lesser the incidence of multisystem failure & complications.

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