

Original Research Article

Clinical manifestations in calotropis poisoning: a prospective study in Government General Hospital Nalgonda, India

C. Yadavendra Reddy*

Department of Medicine, Government Medical College, Nalgonda, Telangana, India

Received: 21 May 2019

Revised: 10 June 2019

Accepted: 03 July 2019

*Correspondence:

Dr. C. Yadavendra Reddy,

E-mail: chamareddy_07@yahoo.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: *Calotropis procera* commonly known as Madar is common shrub all over India. Its chemical component Calotropin, which is derived from latex is known to cause injury to eyes and oral mucosa. Toxic manifestations following accidental ingestion are mostly gastrointestinal. This study was aimed at studying the various clinical manifestations of Calotropis poisoning in patients admitted to GGH Nalgonda.

Methods: This prospective observational study was done from Feb 2019 to May 2019. All patients both male and female admitted to GGH Nalgonda during this period were studied. Patients below 12 years, pregnant women and patients with earlier gastritis, hepatitis, stomatitis were excluded from the study. The study was carried out in all patients fulfilling the inclusion and exclusion criteria.

Results: A total of 60 patients 45 females and 15 males presented during the study period. Most of the patients presented with abdominal pain 15 (25%), hepatitis 10 (16.6%), stomatitis 12 (20%), vomiting 8 (13.3%), diarrhea 6 (10%), hyperkalemia 3 (5%), tachycardia 5 (8.3%), convulsion 1 (1.6%).

Conclusions: It was observed from the study that most of the patients had abdominal pain as the major symptom. Stomatitis was the second most common symptom. It was observed consumption of the toxin in lesser quantities produced these symptoms in large quantities produced tachycardia, hyperkalemia and convulsions.

Keywords: Calotropin, Convulsions, Gastritis, Hepatitis, Oral mucosa, Tachycardia

INTRODUCTION

There are two common species of Calotropis namely *C. gigantea* and *C. procera*. Calotropis is the genus of plants that produce milky sap hence also called milkweed. *C. procera* is a poisonous plant in which Calotropin is a compound in the latex is more toxic than strychnine.¹ *C. procera* is a perennial greyish green, woody shrub with broad ovate fleshy leaves that grows wild in tropics and warm temperate regions.^{2,3} Among the two species *C. procera* is more toxic and is assumed even more poisonous than cobra venom. *C. procera* species are found in Nalgonda. The toxic parts are leaves, stem and

roots. The root especially of *C. procera* is a powerful poison. The cobra and other snakes cannot even stand its smell. Hence carried by snake charmers in Bengal to control or tame unruly cobras.⁴ In the leaves, Mudarin is the principle active constituent as well as bitter yellow acid, resin and 3 toxic glycosides calotropin, uscharin and calotoxin. Toxic principles are Uscharin, Calotoxin, Calactin, Calotropin, Calotropage.⁴ Milk being an irritant, neurotoxic and also due to anticholinergic responses cause toxicity and various fatal presentation. Serum containing 3% of Gigantin is highly virulent toxicant.⁴ When taken in large quantities internally Madar juice and latex gives rise to an acrid, bitter taste and burning pain in

throat and stomach. These are followed by salivation, stomatitis, vomiting, diarrhea, dilated pupils, tetanic convulsions, collapse and death. Sometimes delirium may occur. The fatal dose is not determined. The fatal period varies from half an hour to 8 hours.⁵ The patients admitted are generally managed conservatively. Gastric lavage done and demulcent drinks given. Supportive and symptomatic treatment to be administered to maintain vital status, if necessary oxygen inhalation to be given.⁵ The cases admitted in Nalgonda were mostly after suicidal attempts. Patients were treated conservatively and given symptomatic treatment and discharged in stable condition.

METHODS

All patients admitted to GGH Nalgonda during the study period were observed. A Prospective observational study was done in Government General Hospital Nalgonda during the period Feb 2019 to May 2019. A total of 60 patients (male and female) admitted to Medicine Department were studied. All patients aged ≥ 12 years, both sexes and patients admitted immediately were included. Patients excluded were pregnant women, with previous liver failure, stomatitis, seizure disorder and cardiac problem. The statistical software SPASS was used for the analysis of the data and Microsoft word and excel have been used to generate graphs, figures etc.

RESULTS

Out of 60 patients 45 (75%) were females and 15 (25%) were males. Female incidence was more and more of a suicidal tendency. Patients were assessed in different age groups with incidence being more in the age group 20-30 years. The mean age of incidence was around 30 years. Patients were assessed symptom wise with most of the patients complaining of abdominal pain 15 (25%), stomatitis 12 (20%), Hepatitis 10 (16.6%), vomiting 8 (13.3%), diarrhea 5 (8.3%), tachycardia 5 (8.3%), hyperkalemia 3 (5%), convulsions 1 (1.6%).

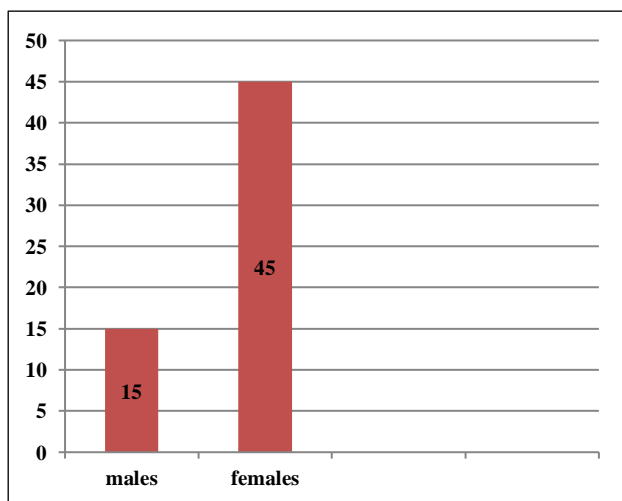


Figure 1: Gender wise distribution.

Figure 1 represents the observation that 45 females consumed calotropis compared to 15 males. The female to male incidence is about 3:1. This observation confirms that it is consumed as suicidal agent by females.

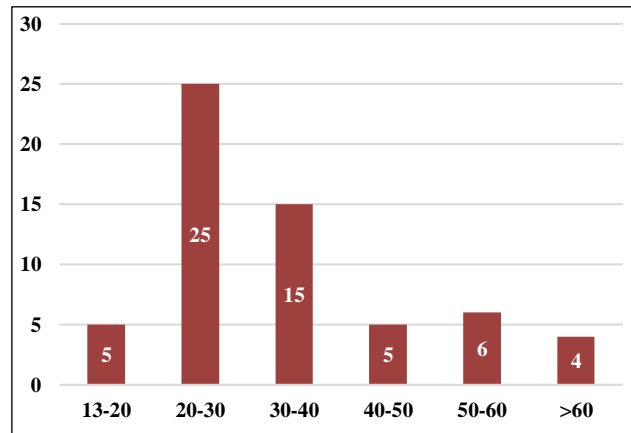


Figure 2: Age wise distribution of patients.

Figure 2 shows that patients are more in the age group 20-30 years. It confirms the observation that the young are more prone to toxic effects of the calotropis. The gradual decreasing trend in the adult groups represents that toxic effects are less in adults. The mean age of incidence was around 30 years.

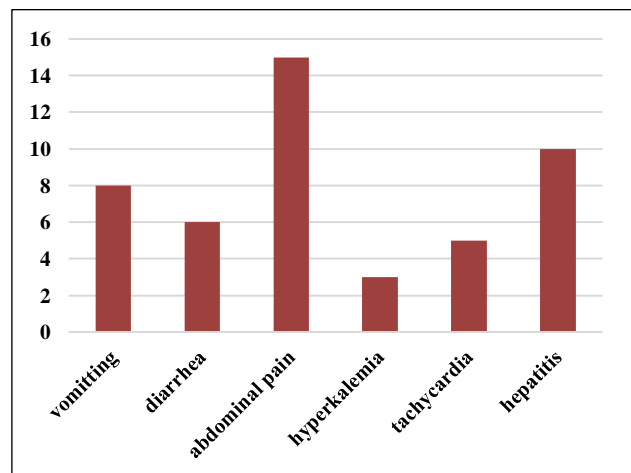


Figure 3: Symptom wise distribution of patients.

Figure 3 shows the symptom wise distribution in the patients. It is observed that 15 patients had abdominal pain. The toxic effect of the calotropin was more on the mucous membranes of the stomach. Life threatening manifestations like tachycardia and hyperkalemia were less indicating that toxin is less dangerous when taken in small quantities.

DISCUSSION

Abdominal pain is the most common symptom in the patients may be due to the toxic effect and corrosive

property of the milk latex. It is known that on crushing the leaves and the stalk a thick milky juice is obtained which on heating produces an extremely toxic serum which at volume of 0.05 ml is enough to kill a frog.⁶ In large doses leaf juices and latex produces toxic symptoms like burning in throat, irritation of stomach, nausea, vomiting, diarrhea, tremors, vertigo and convulsions.⁷ By internal usage it causes vomiting and diarrhea and external use it causes breaking of skin. Due to its caustic effect loss of sight occurs when enters the eyes.⁸ Signs of irritation in stomach and intestine may be seen. In a woman who died due to calotropis poisoning the small intestines, liver, spleen and kidney were congested.⁵ The latex of calotropis contains several alkaloids which caustic and poisonous causing dimness of vision with photophobia are.⁹ Application of latex to the tooth caries resulted in pain, swelling with burning of mucosa and inflammation.¹⁰

Accidental exposure to latex produces dermatitis, keratitis and toxic iridocyclitis.¹¹ The acute inflammation induced by latex involves edema formation and cellular infiltration has been attributed to the presence of histamine in latex and the release of mast cell histamines.¹² Calotropin a compound in the latex is more toxic than strychnine.¹³ Oral mucosa injury immediately following the ingestion of toxic calotropin may be the cause of stomatitis. The toxic element interacting with normal metabolism may be causing the alteration in the liver parameters. The toxic consumption causes the inflammation of the mucous membranes of the stomach causing pain. The toxin causes blisters, lesions and eruptions. Since most of the cases admitted were accidental all patients stabilized with supportive measures and discharged in stable condition.

CONCLUSION

It was concluded from the study that abdominal pain is the most common symptom presentation in Calotropis poisoning. Further it is observed that the toxic compound can cause serious systemic manifestations if taken in large quantities. There is lack of literature regarding details of clinical manifestation following ingestion. This is due to lack of reporting or due to lack of systemic involvement. Calotropis still continues to be used in various herbal remedies and has several medico legal implications. Judicial use, optimization of reporting and facilitating further research is warranted.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Punia PG. A review on varieties of *C. procera* and *C. gigantea*. 2013 May, 2(5).
2. Huber-H Asclepiadaceae. In: A revised handbook of flora of ceylon. Aemrind Publishing Company private limited New Delhi; 1985(4): 73-79.
3. Hussein HI, Kamel A, Zaid MA, El Sabae H, Saleh MA. Uscharin, the most potent molluscidal compound tested against land snails. J Chem Virol. 1994;20(1):135-40.
4. K.R.Srikanta murthy Astanga Samgraha of Vagbhata, Varanasi; Chaukhamb orientalia, 9th edition. 2005.
5. Modi P. Jaising, Medical Jurisprudence and Toxicology 23rd edition first reprint, 2001 Dr. K. Mathiharan and Dr. Amit Patnaik, Lexis, nexis, New Delhi; 2006: 234-238.
6. Tomar VP, Agarwal PK, Agarwal BL. Toxic iridocyclitis caused by Calotropis. Indian J Ophthalmol. 1970;18(1):15.
7. Dr. Dole A.Vilas Rasashastra; Varanasi; Chaukhambha Sanskrit Pratisthan 1st edition. 2004: 423-425.
8. Sathandas Sharma, Mothilal Banarsi das, Rasatarigini, Varanasi; 1st edition. 2015: 743.
9. Samar KB, Arup B, Ayan M, Prashant S. Ocular toxicity by latex of Calotropis procera. Indian J Ophthalmol. 2009;57:232-4.
10. Singh V. Calotropis boon or bane?. Open J Stomatol. 2012;2(02):149.
11. Singh H, Kumar S, Dewan S, Kumar VL. Inflammation induced by latex of Calotropis procera-a new model to evaluate anti-inflammatory drugs. J Pharmacological Toxicological Methods. 2000;43(3):219-24.
12. Shivkar YM, Kumar VL. Histamine mediates the pro-inflammatory effect of latex of Calotropis procera in rats. Mediators of Inflammation. 2003;12(5):299-302.
13. Kupchan SM, Knox JR, Kelsey JE, Renauld JS. Calotropin, a cytotoxic principle isolated from *Asclepias curassavica* L. Sci. 1964;146(3652):1685-6.

Cite this article as: Reddy CY. Clinical manifestations in calotropis poisoning: a prospective study in Government general hospital Nalgonda, India. Int J Adv Med 2019;6:1314-6.