

## Herbal toxicity: A case report of toxicity with *Colchicum autumnale* in a 44-year-old man

Mitra Rahimi<sup>1</sup>, Fatemeh Razavi<sup>2</sup>, Mahtab Hajian<sup>2</sup>, Amir Noyani<sup>3\*</sup>

<sup>1</sup>Toxicological Research Center, Excellence Center of Clinical Toxicology, Department of Clinical Toxicology, Loghman Hakim Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

<sup>2</sup>Student Research Committee, School of Medicine, Shahrood University of Medical Sciences, Shahrood, Iran

<sup>3</sup>Clinical Research Development Unit, Imam Hossein Hospital, Shahrood University of Medical Sciences, Shahrood, Iran

Received: 11 October 2020

Accepted: 24 August 2021

### Abstract:

**Background and aims:** *Colchicum autumnale* contains an alkaloid called colchicine, which blocks the cell division by inhibiting mitosis. This study investigated a patient who was poisoned with *C. autumnale* in Iran.

**Description:** The patient was a 44-year-old man who came to the emergency poisoning ward after a day of hiking and eating soup. He presented with severe nausea and vomiting. The patient was admitted to the ICU two days later with general toxic conditions, complaining of chest pain, nausea, vomiting and shortness of breath. The laboratory tests showed elevated liver enzymes and pancytopenia. He developed respiratory distress and physician had to intubate him. He was treated with antibiotics, GCSF for pancytopenia and antioxidant to protect the liver.

**Conclusion:** The patient responded to broad spectrum antibiotic, antifungal and GCSF. Paying attention to the patient's history was the key to appropriate diagnosis.

**Keywords:** Toxicology, Poisoning, Colchicinum, Emergency Medicine, Case Report

\*Corresponding author: Clinical Research Development Unit, Imam Hossein Hospital, Shahrood University of Medical Sciences, Shahrood, Iran. Tel: 09118495609. E-mail address: a.noyani@shmu.ac.ir

## INTRODUCTION

Colchicum autumnale is commonly known as autumn crocus, and as 'gowri gedde' in the southern region of Karnataka State, southern India. It contains an alkaloid called colchicine, which blocks the cell division by inhibiting mitosis (1). Colchicine is also a well-known medication for the treatment of gout and fever, whose treatment and toxicity spectrum is unknown. It is taken orally and absorbed by the digestive tract and enters the bloodstream through the liver. At cellular level, colchicine prevents endocytosis and exocytosis of cells and therefore can damage all cells (2) Usually within the first 24 hours, patients present with gastrointestinal complaints such as nausea and vomiting, which over time may take 1-7 days to appear, and proceed to multiple organ damage and even death. The recovery process may take up to several weeks, which may be associated with the use of hepatic drugs such as clarithromycin or the use of herbs containing colchicine (3, 4). In this study, we reported a case of toxicity with a herbal medicine containing colchicine called Soranjan.

## Discussion

The patient was a 44-year-old man who came to the emergency room one day after eating soup. He had mistakenly eaten *C. autumnale* instead of garlic. He told he made the mistake

because they have similar appearance (Fig.1).The patient complained of nausea and vomiting. In physical examination, the patient was alert, the pupil was normal, the lungs were clear, the patient's abdomen was soft, and no evidence of organomegaly was observed. The patient's laboratory tests were normal (Table 1). After six hours, the patient was discharged from the emergency room after symptomatic therapy.

Two days after discharge, the patient returned to the emergency room with general malaise, shortness of breath, chest pain and vomiting. The patient was toxic and complained of chest pain. In examination head and neck showed oral aphthous ulcer. The cardiologist discharged the patient after observing normal ECG (electrocardiogram), administering negative troponin and ruling out cardiac dysfunction. Then, the patient was referred to the toxicology ward because of his history. The patient's breathing worsened. The ABG showed evidence of metabolic acidosis and after few days, the physician observed pancytopenia and multi organ failure (Table 2). The patient's white blood cell count reached to 800. At the same time, as the patient's respiratory condition deteriorated, the patient was intubated and his fever exacerbated after intubation. Internal medicine and infectious and hematology consults were requested and treatment started with a broad-spectrum antibiotic and antifungal agents (meropenem,

vancomycin and amikacin) and GCSF (8MCG/kg/daily). The drugs administration was discontinued after the patient's fever dropped and white blood cell count reached 1500 after approximately one week of antibiotic and GCSF administration. He was transferred to the ward after oral tolerance, and was discharged one week later and was treated with oral antioxidant such as livergoal and zinc. He was followed up by checking the complete blood count and liver enzymes weekly for three months.

### Conclusion

Although colchicinum poisoning is rare, it is important to be aware of its toxicity and to know its symptoms due to its high mortality (5). Gastrointestinal symptoms have been shown in up to 80% of the patients (6), which should be taken seriously and the patients should be evaluated periodically until they are discharged. In our case, nausea and vomiting were reported. In the study of Klintschar et al., a patient came to emergency ward with nausea and vomiting. He died three days later with multi-organ failure (bone marrow suppression, liver toxicity and lung injury) (7). In the study of Zenjko et al., a patient referred to their hospital with multi-organ damage and they admitted the patient to the ICU and started mechanical ventilation (to treat insufficient ventilation and oxygenation), dopamine (to increase blood pressure), noradrenaline (to increase blood pressure), crystalloid solutions and fresh frozen plasma (to treat bleeding). Five days after intoxication, the patient died due to

oliguria and cardiopulmonary insufficiency (8). There is no antidote for colchicine and supportive treatment is the only choice. Aggressive primary decontamination with gastric lavage and activated charcoal is required as early as possible. Hemodialysis or hemoperfusion are not particularly effective due to the cell distribution of the drug (9). Because colchicine poisoning does not have a specific pattern, toxidrome and treatment, it is important to ask for a history of ingesting colchicine-containing plants or food.

### TAKE HOME MESSAGES

With regard to the increasing use of herbal drugs, it is important to pay attention to three points: The first one is the patient's biography. In this case, if we had not asked about ingestion of *C. autumnale*, doctors' diagnosis was wrong. And secondly, all herbal drugs are not safe. Finally, we guess GCSF can be considered to treat pancytopenia in similar patients. However, we need further evidence for approving GCS effect in these patients



Fig. 1: Kingdom: Plantae, Clade: Tracheophytes, Family: Colchicaceae, Genus: Colchicum, Species: Colchicum autumnale (download from: <https://plants.ces.ncsu.edu/plants/colchicum-autumnal>)

Table 1. Laboratory tests on the first day after ICU admission

	Patient	Normal Range
Hemoglobin	11 g/dl	13-18 (male) g/dl
White blood cell count	4500 * 10 <sup>3</sup> /mm <sup>3</sup>	4.3-10.8 *10 <sup>3</sup> /mm <sup>3</sup>
Platelet	290 * 10 <sup>3</sup> /mm <sup>3</sup>	150-450 *10 <sup>3</sup> /mm <sup>3</sup>
LDH (lactate dehydrogenase)	760 u/l	50-480 u/l
Creatinine	1.4 mg/dl	0.6-1.2 (male) mg/dl
AST (aspartate aminotransferase)	123 u/l	Up to 37 u/l
ALT (alanine aminotransferase)	101 u/l	Up to 41 u/l
Total bilirubin	1 mg/dl	Up to 1.2 mg/dl
Na (natrium)	136 meq/l	135-145 meq/l
K (potassium)	3.9 meq/l	3.5-5 meq/l
PT (prothrombin time)	11 sec	10-12 sec
PTT (partial thromboplastin time)	27 sec	30-45 sec
INR (international normalized ratio)	0.7	1-2
Digoxin level	0.17 ng/ml	0.4-2 ng/ml
Cholinesterase	8105 U/grHb	71-292 U/grHb

Table 2. Laboratory tests three days after ICU admission

Lab Test	Patient	Normal Range
Hemoglobin	9 g/dl	13-18 (male) g/dl
White blood cell	800* 10 <sup>3</sup> /mm <sup>3</sup>	4.3-10.8 *10 <sup>3</sup> /mm <sup>3</sup>
Platelet	144000* 10 <sup>3</sup> /mm <sup>3</sup>	150-450 *10 <sup>3</sup> /mm <sup>3</sup>
Lactate dehydrogenase	800 u/l	50-480 u/l
Creatinine	2.3 mg/dl	0.6-1.5 (male) mg/dl
AST (aspartate aminotransferase)	135 u/l	Up to 37 u/l
ALT (alanine aminotransferase)	121 u/l	Up to 41 u/l
Total bilirubin	1 mg/dl	Up to 1.2 mg/dl
Na (sodium)	150 meq/l	135-145 meq/l
K (potassium)	4.3 meq/l	3.5-5 meq/l
PT (prothrombin time)	11 sec	10-12 sec
PTT (partial thromboplastin time)	27 sec	30-45 sec
INR (international normalized ratio)	0.7	1-2
Blood sugar	89 mg/dl	60-199 mg/dl
Troponin	Neg	

## Acknowledgments

The authors of the article would like to thank the Clinical Research Development Unit of Imam Hossein Hospital for funding the project. This article was derived from +6a research project (code of ethics: IR.SHMU.REC.1399.016) at Shahroud University of Medical Sciences.

## Conflict of interests:

Nil.

## References

- 1-Brvar M, Ploj T, Kozelj G, Mozina M, Noc M, Bunc M. Case report: fatal poisoning with *Colchicum autumnale*. *Critical Care*. 2004 Feb;8(1):1-4.
2. Finkelstein Y, Aks SE, Hutson JR, Juurlink DN, Nguyen P, Dubnov-Raz G, Pollak U, Koren G, Bentur Y. Colchicine poisoning: the dark side of an ancient drug. *Clinical toxicology*. 2010 Jun 1;48(5):407-14.
3. Rollot F, Pajot O, Chauvelot-Moachon L, Nazal EM, Kélaïdi C, Blanche P. Acute colchicine intoxication during clarithromycin administration. *Annals of Pharmacotherapy*. 2004 Dec;38(12):2074-7.
4. Akdag I, Ersoy A, Kahvecioglu S, Gullulu M, Dilek K. Acute colchicine intoxication during clarithromycin administration in patients with chronic renal failure. *Journal of nephrology*. 2006;19(4):515-7.
5. Hirayama I, Hiruma T, Ueda Y, Doi K, Morimura N. A critically ill patient after a colchicine overdose below the lethal dose: a case report. *Journal of medical case reports*. 2018 Dec;12(1):191.
6. Maxwell MJ, Muthu P, Pritty PE. Accidental colchicine overdose. A case report and literature review. *Emergency Medicine Journal*. 2002 May 1;19(3):265-6.
7. Klintschar M, Beham-Schmidt C, Radner H, Henning G, Roll P. Colchicine poisoning by accidental ingestion of meadow saffron (*Colchicum autumnale*): pathological and medicolegal aspects. *Forensic science international*. 1999 Dec 20;106(3):191-200.
8. Sundov Z, Nincevic Z, Definis-Gojanovic M, Glavina-Durdov M, Jukic I, Hulina N, Tonkic A. Fatal colchicine poisoning by accidental ingestion of meadow saffron-case report. *Forensic science international*. 2005 May 10;149(2-3):253-6.
9. N. Stern, H. Kupferschmidt, P.J. Meier-Abt, Follow-up and therapy of acute colchicine poisoning, *Schweiz. Rundsch. Med. Prax.* 86 (1997) 952–956.