


## CASE REPORT

# Colchicine poisoning treated with hemoperfusion and hemodialysis: A case report

Maral Ramezani<sup>1,2</sup> | Babak Mostafazadeh<sup>3</sup> | Mitra Rahimi<sup>3</sup> |  
Peyman Erfan Talab Evini<sup>3</sup> | Shahin Shadnia<sup>3</sup> 

<sup>1</sup>Department of Pharmacology, School of Medicine, Arak University of Medical Sciences, Arak, Iran

<sup>2</sup>Traditional and Complementary Medicine Research Center, Arak University of Medical Sciences, Arak, Iran

<sup>3</sup>Toxicological Research Center, Department of Clinical Toxicology, Loghman Hakim Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

## Correspondence

Shahin Shadnia, FACMT, Loghman Hakim Hospital & Poison Center, Tehran, Iran.  
Email: [shahin1380@gmail.com](mailto:shahin1380@gmail.com)

## Abstract

This case report described an improved case of colchicine poisoning using hemoperfusion and hemodialysis.

## KEYWORDS

colchicine, hemodialysis, hemoperfusion, poisoning

## 1 | INTRODUCTION

Colchicine is a medicine that can be extracted from plants such as *Colchicum autumnale* and *Gloriosa superba*. Its therapeutic application has been confirmed for familial Mediterranean fever (FMF), gout, amyloidosis, Behcet's syndrome, pericarditis, arthritis, pulmonary fibrosis, vasculitis, biliary cirrhosis, pseudo-gout, and specific spondyloarthropathy.<sup>1,2</sup> The therapeutic index of colchicine is narrow and, therefore, the interval between non-toxic, toxic and lethal doses is short.<sup>3</sup> Colchicine poisoning has no specific antidote. Early detection of poisoning is important because exposure can lead to multiple organ failure and death.<sup>3</sup> We describe a case of colchicine poisoning treated with hemoperfusion and hemodialysis, with recovery and hospital discharge.

## 2 | CASE REPORT

A 36-year-old married woman was referred to Loghman Hakim Hospital in Tehran 2h after taking 10 acetaminophens 500 and 20 colchicine 1 mg tablets. The patient had no history of suicide, psychiatric illness or substance abuse. She had no history of previous illness or liver disease. Colchicine was not a drug used by the patient herself. Vital signs were as follows: heart rate of 73 beats per minute, respiratory rate of 13 breaths per minute, and blood pressure was 110/70 mmHg. On examination, the pupils were symmetrical with an average size of 3–4 mm, examinations of the heart, lungs, skin, and intestinal sounds were normal, and the patient had no trauma, ulceration, or sweating. She had severe nausea and vomiting.

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**TABLE 2** Selected laboratory results 1 and 2 week after poisoning

	Bun	Cr	WBC	Hb	Plt	BS	AST	ALT	ALP
1 week after poisoning	22	0.9	6.1	12.9	113	99	42	118	226
2 weeks after poisoning			5.7	13.2	195		22	28	195

### 3 | DISCUSSION

Colchicine has anti-inflammatory properties. Colchicine can block metaphase due to its anti-mitotic effects. The toxic effects of colchicine are probably due to its anti-mitotic activity in proliferating tissues such as bone marrow.<sup>4,5</sup> The maximum recommended daily dose for colchicine is 1.8 mg per day.<sup>1</sup> Colchicine is rapidly absorbed from the gastrointestinal tract. Serum concentrations peak at 0.5–3.0 h after ingestion.<sup>3,6</sup> It undergoes extensive hepatic first-pass metabolism due to its systemic bioavailability (25% to 50%).<sup>3,6,7</sup> Its protein binding is 10%–50% and volume of distribution ranges between 2 and 12 L/kg but reaches up to 21 L/kg in overdose. Colchicine and its metabolites undergo enterohepatic recirculation.<sup>3,6,8</sup>

Gastrointestinal and coagulation disorders were reported at doses below 0.5 mg/kg, bone marrow aplasia in patients taking 0.5–0.8 mg/kg, and death at doses more than 0.8 mg/kg in acute use.<sup>3,6</sup> The clinical course of acute colchicine poisoning may be divided into three phases. The first (gastrointestinal) phase reflects gastrointestinal mucosal damage (nausea and vomiting, abdominal distress, and diarrhea). The second (multi-organ) phase is characterized by multi organ dysfunction and metabolic derangements are also common (acute kidney injury, sepsis, rhabdomyolysis, electrolyte imbalances & etc). The third phase, which is characterized by recovery of bone marrow depression with rebound leukocytosis, resolution of organ failure, and can be followed by complete recovery.<sup>3,6,9</sup>

Measurement of colchicine concentration in body fluids is not common and no consistent association with disease severity has been reported.<sup>6,9</sup> Although in some studies its concentration in the body has been measured.<sup>10,11</sup> Treatment of colchicine poisoning is supportive. Decontamination is done by gastric lavage and active charcoal. Because the drug and its metabolites have an enterohepatic cycle, multiple-dose activated charcoal (MDAC) is also recommended.<sup>3,6</sup> Many studies have reported that hemodialysis and hemoperfusion are not effective for colchicine poisoning due to their high volume distribution.<sup>3,6,8</sup> In Goldfrank's book, it is stated that due to the large volume of distribution of colchicine, the use of hemodialysis and hemoperfusion are not a viable options except in cases of kidney failure.<sup>6</sup> In the article by Sadiq

et al.,<sup>8</sup> it is mentioned that dialysis does not remove colchicine and that patients undergoing dialysis need a dose reduction due to their impaired renal function. However, in various cases, hemodialysis and hemoperfusion have been used along with other methods to treat colchicine intoxication.

A total of 43 cases of colchicine poisoning in China have been reported that plasma exchange combined with continuous veno-venous hemodialysis filtration can increase survival time.<sup>12</sup> In one case, a 68-year-old woman underwent extracorporeal life support (ECLS) and hemodialysis to treat colchicine intoxication.<sup>13</sup> Hemoperfusion was performed on a 19-year-old woman poisoned with colchicine to remove toxins from the blood.<sup>14</sup>

Our case was a case of poisoning with an oral dose of 20 mg colchicine, which was performed continuous hemodialysis for 8 h and hemoperfusion for 8 h in parallel. Gastrointestinal decontamination was performed for the patient with multiple doses of activated charcoal and sorbitol. The patient eventually recovered and was followed up for up to 2 weeks after intoxication. During treatment, the patient showed an increase in the activity of liver enzymes and hypokalemia, which was treated appropriately.

Colchicine overdose is an uncommon but life-threatening complication that manifests itself with progressive multi-organ dysfunction. Using extracorporeal removal methods such as hemodialysis and hemoperfusion to remove the drug from the blood, although rarely used, can be effective and save the patient.

#### AUTHOR CONTRIBUTIONS

MR collected the data for the study and wrote the manuscript. SS and BM revised the manuscript for grammar and syntax mistakes. MR and PETE corrected the manuscript for its scientific basis and revised the manuscript for grammar and syntax mistakes.

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## CONFLICT OF INTEREST

The authors declare that they have no competing or conflict of interests.

## DATA AVAILABILITY STATEMENT

The data and materials used in the current study are available from the corresponding author on reasonable request.

## CONSENT

Informed written consent was obtained from the patient to publish this case report. A copy of the written consent form is available for review by the journal editor.

## ORCID

Shahin Shadnia  <https://orcid.org/0000-0002-9401-0781>

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