

# Hemlock (*Conium Maculatum*) Poisoning In A Child

## Bir Çocuk Hastada Baldıran Otu (*Conium Maculatum*) Zehirlenmesi

Capan KONCA,<sup>1</sup> Zelal KAHRAMANER,<sup>1</sup> Mehmet BOSNAK,<sup>2</sup> Halil KOCAMAZ<sup>3</sup>

<sup>1</sup>Department of Pediatrics, Adiyaman University Faculty of Medicine, Adiyaman;

<sup>2</sup>Department of Pediatrics, Gaziantep University Faculty of Medicine, Gaziantep;

<sup>3</sup>Department of Pediatrics, Gaziantep Children Health and Diseases Hospital, Gaziantep

### SUMMARY

Poison hemlock (*Conium maculatum*) is a plant that is poisonous for humans and animals. Accidental ingestion of the plant may result in central nervous system depression, respiratory failure, acute rhabdomyolysis, acute renal failure and even death. The main treatment of hemlock poisoning is supportive care. The case of a 6-year-old girl who was admitted to the emergency department with complaints of burning sensation in mouth, hypersalivation, tremor in hands and ataxia after ingestion of poison hemlock is presented here with clinical and laboratory features. In this case, we aim to report that accidental ingestion of plants resembling vegetables that are consumed daily can lead to serious complications and even death.

**Key words:** *Conium maculatum*; childhood; poisoning; hemlock.

### ÖZET

Baldıran otu (*Conium maculatum*) insanlar ve hayvanlar için zehirli bir bitkidir. Yanlışlıkla alımı sonucu merkezi sinir sistemi depresyonu, solunum yetersizliği, akut rabdomiyoliz, akut böbrek yetersizliği ve hatta ölüm meydana gelebilir. *Conium maculatum* zehirlenmesinde tedavi destekleyicidir. Baldıran otu alımı sonrası ağızda yanma, tükürük salgısında artış, ellerde titreme ve yürürken dengesizlik şikâyetleri ile acil servise başvuran 6 yaşında kız çocuğu klinik ve laboratuvar özellikleri ile sunuldu. Bu olgu, çevredeki bazı bitkilerin günlük tüketilen sebzelere benzerliği nedeni ile yanlışlıkla alımları sonucu ciddi zehirlenme belirtileri ve hatta ölüme neden olabileceğini vurgulamak amacıyla sunuldu.

**Anahtar sözcükler:** *Conium maculatum*; çocukluk çağı; zehirlenme.

### Introduction

Poisonings are commonly seen during childhood and are associated with a high mortality rate. The vast majority of poisonings in children are due to taking medications; however, they may rarely be caused by petroleum products, caustic substances, and weeds. *Conium maculatum*, known popularly as hemlock in our country, is a poisonous plant belonging to the family Apiaceae, which grows in grasslands in damp places. *Conium maculatum* is poisonous not only for humans, but also for cattle, sheep, goats, pigs, rabbits, deer, poultry, and insects.<sup>[1]</sup> Poisoning in humans can be caused

by ingestion of the plant, but may also be caused by ingestion of meat from the aforementioned animals.<sup>[2]</sup> Piperidine alkaloids, such as coniine and  $\gamma$ -coniceine, contained within the plant play an important role in the development of poisoning.<sup>[2,3]</sup> Coniine is an alkaloid which is neurotoxic for humans and which causes death via respiratory paralysis. Famous philosopher Socrates died from hemlock poisoning in 399 BC.<sup>[3]</sup>

We present the case of a six-year-old female patient who was referred to our clinic with symptoms of hypersalivation and

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**Correspondence:** Dr. Capan Konca. Adiyaman Üniversitesi Tıp Fakültesi, Çocuk Sağlığı ve Hastalıkları Anabilim Dalı Adiyaman, Turkey.

**e-mai:** dr.capan@hotmail.com

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ataxia due to ingestion of hemlock. The hemlock was mistaken for parsley and consumed. The aim of this report was to emphasize that accidental ingestion of some plants in our environment which closely resemble edible vegetables may produce serious signs of poisoning and even lead to death.

## Case Report

In this report, we present the case of a six-year-old female patient. She ingested a weed found in a garden assuming it was parsley. Two hours later, she was referred to our emergency service due to complaints of burning in the mouth, increased salivation, trembling hands, and walking imbalance. Gastric lavage was performed, and activated carbon was administered in our emergency department. She was then hospitalized in the intensive care unit. The plant, which the family brought with her, was sent to the Faculty of Science, Department of Biology and was identified as *Conium maculatum*, known popularly as hemlock. In her first physical examination, she was fully conscious but agitated, and cooperation could not be established. The increased amount of saliva was too much for her to swallow. The patient's vitals were as follows: arterial blood pressure, 105/65 mmHg; heart rate, 125/min; pulse, filiform; and peripheral oxygen saturation (SpO<sub>2</sub>), 97%. Her neurological examination revealed a tremor in both hands, loss of motor function in both lower limbs (4/5), limitations in the movement of tongue, ataxia, dilation in both pupils, and decreased response to light.

The patient was monitored, intravenous (IV) crystalloid infusion was started, and emergent laboratory tests were studied immediately. Complete blood count, arterial blood gases, and biochemical tests did not reveal any pathologies. The results of the first coagulation tests were PTT, 20 seconds; INR, 2; and APTT, 50 seconds. Control coagulation test results were as follows: PTT, 25 seconds; INR, 2.3; and APTT, 54 seconds. Thus, a unit of fresh frozen plasma was administered to the patient. After transfusion, her coagulation test results were normal. Her ECG revealed no abnormalities except sinus tachycardia. Secretion crackles were observed during auscultation in both lungs, however, her chest radiography revealed no abnormalities. Repeated laboratory tests demonstrated no deterioration, and the patient did not develop respiratory distress. The tremor in her hands recovered after 6-8 hours, and the increased salivation diminished after 12-14 hours. Limitations in tongue movement disappeared on the second day, and she started talking again. Difficulty in walking and ataxia disappeared. The symptoms which she presented at admission disappeared completely, her physical examination findings became normal, and she was discharged from the hospital three days after admission with full recovery.



**Figure 1.** *Conium maculatum* plant that the family brought with the patient.

## Discussion

*Conium maculatum* poisoning occurs due to some of its piperidine alkaloid contents which have nicotinic effects, such as coniceine, coniine, N-methyl coniine, conhydrine, and pseudoconhydrine. While every part of the plant is toxic, the highest alkaloid concentration exists in the seeds.<sup>[4]</sup> Ataxia and headache are the symptoms observed in the early stage of poisoning. Increased salivation, tachycardia, and pupillary dilation develop due to the effects of the plant on the autonomic ganglia. Muscle weakness or paralysis, bradycardia, and central nervous system depression may develop in some of the patients due to increased cholinergic stimuli.<sup>[5]</sup> Rhabdomyolysis and acute renal failure have also been reported in some cases as a consequence of *Conium maculatum* poisoning.<sup>[6]</sup> Each of these piperidine alkaloids is a kind of peripheral neurotoxin; the neurotoxins show curare-like effects in neuromuscular junctions and create nicotinic effects in the autonomic ganglia.<sup>[7]</sup>

A previous report of two patients who were poisoned by accidental ingestion of the plant demonstrated that early stage symptoms recovered with symptomatic treatment.<sup>[8]</sup> However, two additional studies conducted in our country observed that respiratory depression developed immediately after early stage symptoms, and patients required mechanical ventilation.<sup>[9,10]</sup> In the present study, nicotinic symptoms, such as hand tremors, difficulty in walking, ataxia, and

excessive salivation were observed on admission. However, our patient did not develop acute kidney failure, rhabdomyolysis, or respiratory failure. Our patient exhibited prolonged coagulation tests, which have not been previously reported in the literature. This abnormality, observed in the early stage, may have developed due to the deterioration of factors in the intrinsic and extrinsic coagulation cascade or in the common pathway coagulation cascade. We did not have the opportunity to measure the patient's blood factor levels and, therefore, could not reach a definitive conclusion. However, careful examination of coagulation tests in similar future cases may be useful.

No specific antidote exists for the treatment of this toxin. Therefore, symptomatic treatment is the main treatment. Basic life support should be provided, followed by the administration of gastric lavage and activated carbon to reduce absorption. Fluid supplements should be administered to the patient via an intravenous access. Benzodiazepines or barbiturates should be used in the treatment if convulsions develop. Fluid supplementation and urine alkalinization should be provided in case of rhabdomyolysis or myoglobinuria. Hemodialysis and hemoperfusion are not reported to be useful in the treatment of rhabdomyolysis.<sup>[11]</sup> Close electrolyte and biochemical examinations and monitoring should be performed during intensive care unit follow-up. Death occurs mainly due to respiratory failure and paralysis of the respiratory muscles, thus continuous respiration should be ensured and mechanical ventilation support should be provided if necessary. Some previous studies in the literature have reported that children and adult patients required mechanical ventilation support after hemlock poisoning.<sup>[9,10,12]</sup> Our patient recovered completely without sequelae after receiving only supportive treatment.

In conclusion, the aim of the present report was to emphasize that accidental ingestion of some plants in our environment which closely resemble edible vegetables may produce serious signs of poisoning and even lead to death.

### Conflict of Interest

The authors declare that there is no potential conflicts of interest.

### References

1. Vetter J. Poison hemlock (*Conium maculatum* L.). *Food Chem Toxicol* 2004;42:1373-82.
2. López TA, Cid MS, Bianchini ML. Biochemistry of hemlock (*Conium maculatum* L.) alkaloids and their acute and chronic toxicity in livestock. A review. *Toxicol* 1999;37:841-65.
3. Reynolds T. Hemlock alkaloids from Socrates to poison aloes. *Phytochemistry* 2005;66:1399-406.
4. Leete EB. Becoming a hospice volunteer. *Am J Hosp Palliat Care* 1994;11:27-32.
5. Ferah AU, Dilek MO, Ercument Y, Oktay D. Hemlock poisoning (case report): die like socrates. *Resuscitation* 2006;70:337.
6. Rizzi D, Basile C, Di Maggio A, Sebastio A, Introna F Jr, Rizzi R, et al. Clinical spectrum of accidental hemlock poisoning: neurotoxic manifestations, rhabdomyolysis and acute tubular necrosis. *Nephrol Dial Transplant* 1991;6:939-43.
7. Krenzelok EP, Jacobsen TD, Aronin JM. Hemlock ingestions: The most deadly plant exposures. *J Toxicol Clin Toxicol* 1996;34:601-2.
8. Colombo ML, Marangon K, Locatelli C, Giacche M, Zulli R, Res tani P. Hemlock poisoning due to plant misidentification. *J Pharm Sci Res* 2009;1:43-7.
9. Erenler AK, Baydin A, Duran L, Yordan T, Turkoz B. A case of respiratory failure due to poison hemlock poisoning presented to an emergency department. *Hong Kong J Emerg Med* 2011;18:235-8.
10. Başgöl A, Burgutoğlu B, Hancı A. Hayatı tehdit eden akut solunum yetmezliği: Yabani ot zehirlenmesi. *Yoğun Bakım Dergisi* 2003;3:204-6.
11. Froberg B, Ibrahim D, Furbee RB. Plant poisoning. *Emerg Med Clin North Am* 2007;25:375-433.
12. West PL, Horowitz BZ, Montanaro MT, Lindsay JN. Poison hemlock-induced respiratory failure in a toddler. *Pediatr Emerg Care* 2009;25:761-3.