

Persistent metabolic acidosis and severe diarrhoea due to *Artemisia absinthium* poisoning

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Abstract

Herbs have long been used in the treatment of various disorders in traditional medicine since ancient age. *Artemisia absinthium*, one of these herbs, has traditionally been used in different societies for antibiotic, antiparasitic, antifungal and antipyretic purposes. Here, we report a poisoning case of a 10-month-old male infant progressing with severe diarrhoea and persistent metabolic acidosis after ingesting home-prepared *Artemisia absinthium* extract which was given for the treatment of common cold.

Keywords: Poisoning, *Artemisia absinthium*, Diarrhoea, Metabolic acidosis.

Introduction

Herbs have long been used in the treatment of various disorders in traditional medicine since ancient age.¹ *Artemisia absinthium* (*A. absinthium*), also known as wormwood, is a herbaceous or glasswort herb growing in arid or semi-arid habitats in both the northern and southern hemispheres (Figure). From the family of daisies (Asteraceae), *A. absinthium* has traditionally been used in different societies for antibiotic, antiparasitic, antifungal and antipyretic purposes.^{2,3}

Forty-nine different compositions of essential oil of *A. Absinthium* have been reported.³ One of these, α -thujone, has an effect on central nervous system (CNS). The effect of α -thujone on CNS takes place by binding γ -aminobutyric acid type A receptors and blocking chloride channels. Due to the effect, *A. Absinthium* is convulsant and was inspirationally used by artists and poets.¹ In addition, some species of Asteraceae family have antioxidant and acetylcholinesterase inhibitory effect.⁴

We report a poisoning case of a 10-month-old male infant with common cold who was given home-prepared extract of *A. absinthium*. Despite the common use, our case is the first poisoning case due to herb overdose.

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Case Report

A 10-month-old male infant was admitted into the paediatric emergency department (ED) with complaints of fever, fatigue, vomiting and severe diarrhoea. His medical history revealed that the infant had been given by his parents home-made *A. absinthium* extract due to sub-febrile state and coughing that had started three days earlier, but experienced vomiting and diarrhoea nearly 50 times within the preceding two days.

On physical examination, as well as the following vital findings: temperature, 37.4°C; pulse rate, 150bpm; respiration, 40 breaths/min; and, blood pressure, 105/70mmHg, such features as poor general appearance, sunken eyeballs, dryness of mucous membranes, decreased skin turgor and abnormal respiratory pattern in acidotic way were also detected.

Laboratory findings revealed that haemoglobin was 15.4 g/dL, and leucocyte count was $14.2 \times 10^3/\text{mm}^3$ with a differential of 55% neutrophils, 40% lymphocytes and 5% monocytes. While serum creatinine and electrolytes were normal, urea was 100mg/dL (normal range 15-55mg/dL). Serum amylase, aspartate aminotransferase, alanine aminotransferase, alkaline phosphatase and gamma-glutamyl transferase levels were within normal limits. C-reactive protein was 24.5mg/dL (normal range 0-10mg/L), and erythrocyte sedimentation rate was 18 mm/h. Severe metabolic acidosis was observed in blood gas analysis (Table). While urine dipstick test and urine sediment microscopy were normal, urine density was 1.038.

The macroscopic appearance of the patient's stool was rather intriguing, yellowish in a slimy manner and relatively odourless. Rotavirus, enteric adenovirus, giardia

Table: Blood gas parameters of the case within the first 4-day follow-up.

	Day 1	Day 2	Day 3	Day 4
pH	7.14	7.26	7.41	7.43
pCO ₂	24.6	16.3	22.3	30.8
HCO ₃ ⁻	8.1	7.2	13.9	20.2

pH: Acidity.

pCO₂: Partial pressure of Carbon di-oxide.

HCO₃: Bicarbonate.

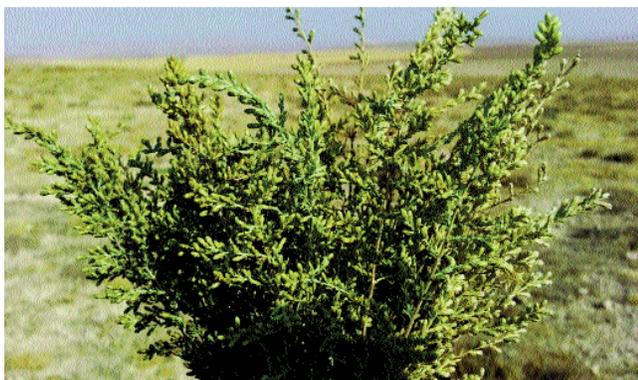


Figure: *Artemisia absinthium*.

lamblia and entamoeba histolytica stool antigen tests were all negative. While stool microscopic examination was normal, cultures of stool and blood were found to be negative.

The patient was presumed as a case of poisoning of *A. absinthium*, based on clinical and laboratory findings. Intravenous (IV) fluid of 3000 cc/m² was administered as 1/3 physiological saline solution along with bicarbonate (HCO₃) treatment. On day 3 after the admission, the patient was started to be orally fed upon the cessation of vomiting. However, due to continuing diarrhoea, IV fluid management was kept on. On day 4 of the follow-up, HCO₃ treatment was stopped after the improvement of blood acid-base parameters. On day 5, because the diarrhoea was soothed, and the colour of stool became normal, IV fluid management was discontinued, and the patient was discharged in good health. The physical examination performed one week later revealed no abnormal findings.

Discussion

Herbs are used widely in alternative medicine in the treatment of numerous symptoms and diseases. In general, herbal medicine is believed to be natural and, therefore, harmless.⁵ However, because such herbal medicine lacks scientifically proven mechanisms of action or using methods and doses, they always have a potential to lead to poisoning. *A. absinthium* has traditionally been used in different societies for antibiotic, antiparasitic, antifungal and antipyretic purposes.² Especially the fact that a Bohemian lifestyle was adopted in the late 19th century, and that *A. absinthium* was started to be used as a source of inspiration among artists and poets led to an increase in its popularity. However, because abusing *A. absinthium* brought about many negative events and ill effects in the early 20th century, *A. absinthium* was banned in many countries.⁶

The first poisoning case due to *A. absinthium* was reported by William Smith in 1863 who noticed that high doses of *A. absinthium* had a stimulatory effect on vasculatory system, and an irritant and vomiting effect on stomach.⁷ Our case had also drunk the extract of *A. absinthium* prepared by boiling at home by the parents. The fact that vomiting attacks and severe diarrhoea started nearly 24 hours after he had ingested the herbal drug, atypical appearance of the stool and its relatively odourless state suggested poisoning. Although the existence of fever on admission, and higher leucocyte count and C-reactive protein level suggested sepsis, due to such factors as non-septic general appearance, body temperature <38.3°C in the follow-up, non-existence of immature leucocytes in peripheral blood smear, normal erythrocyte sedimentation rate (ESR), and lack of positive faecal and blood cultures, the presence of sepsis was ruled out. In spite of suggestive symptoms of gastroenteritis like diarrhoea and vomiting, the diagnosis of acute gastroenteritis was considered to be unlikely because of negative stool examinations and culture.

In a study investigating haematologic and biochemical effects, and weight changes in rats given *A. absinthium* extract at three different doses, it was reported that no significant difference was found between male rats given *A. absinthium* of 1.27g/kg/day and female ones given *A. absinthium* of 2.06 g/kg/day, and those in the control group.⁸ Because any study has yet to be performed related to human beings, we could not evaluate whether the amount of the dose absorbed by our case was high or not. Despite being a traditionally used herbal drug, no standard dose is present for *A. Absinthium*, as with most herbal drugs. In general practice, one to two teaspoonful of *A. Absinthium* extract boiled in water is orally administered whenever pain or common cold is observed, especially in toddlers. However, our case had been given a cup of home-made *A. Absinthium* extract by the parents. However, due to the signs of poisoning, we speculated that our case had absorbed *A. absinthium* extract at a high dose. Unfortunately, being a limitation, no laboratory facilities were present to confirm whether the dose was higher or not.

A. absinthium is reported to have the effects of hallucination, recidivism and derangement on central nervous system.^{1,6} None of such effects were observed in our case probably owing to his younger age. Another study⁴ demonstrated that the extracts derived from Asteraceae family of herbs have acetylcholinesterase inhibitory effect. Therefore, we considered that the cause of the severe diarrhoea witnessed in our case arose from the fact that the increased acetylcholine due to such an

inhibition stimulated muscarinic receptors in intestines.

Conclusion

An antidote for an *A. absinthium* intoxication is not available, nor is there any therapy with proven efficacy, but supportive and symptomatic therapy now seems to be the sole treatment modality. Considering that the use of herbal drugs has recently increased because of false perceptions that herbal drugs are natural and with no adverse effects, poisoning arising from herbal drugs should be considered in patients admitted with unexpected or unexplained symptoms.

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