

Received: 2011.09.14
Accepted: 2011.11.03
Published: 2012.01.19

Severe uvular edema and resulting hypoxemia due to single use of *Ecballium elaterium* extract

Pappas Apostolos¹, Panoutsopoulos Athanasios¹, Gemenetzis Georgios², Seretis Charalambos², Lagoudianakis Emmanouil², Dimitriadis Ioannis¹, Chrysikos Ioannis¹, Kaperoni Anastasia¹, Andrianopoulos Georgios¹

¹ Department of Internal Medicine, General Hospital of Argos, Argos, Greece

² 2nd Department of Surgery, 401 General Military Hospital, Athens, Greece

Summary

Background:

Ecballium elaterium (also known as squirting cucumber in the Mediterranean countries) is a weedy plant that belongs to the Cucurbitacea family. The roots and juice of its fruits were used traditionally against a wide range of diseases and symptoms, since it was known for its anti-inflammatory and analgesic effects. The use of the extract, though, has been linked to allergic reactions and toxic effects. In this report, we present a case of severe uvular edema and hypoxemia due to a single use of *Ecballium elaterium* extract, and we discuss the possibility of life-threatening conditions resulting from the utilization of this particular plant as a remedy.

Case Report:

A male Caucasian presented to the ER with complaints of troubled breathing and retrosternal discomfort that started a few hours before arriving at the ER. The patient's medical history revealed the use of *Ecballium elaterium* extract. Clinical examination confirmed severe uvular edema and hypoxemia. Administration of oxygen and IV drugs (Hydrocortisone) relieved the symptoms and improved the patient's condition. After a 24-hour hospitalization the patient was discharged without further complaints.

Conclusions:

The use of *Ecballium elaterium* extract as a remedy can cause severe adverse effects that should not be ignored. Uvular edema is one of the most common and can lead, as shown above, to hypoxemia, which is a potentially life-threatening condition.

Key words:

***Ecballium elaterium* • uvular edema • hypoxemia • allergic reaction • toxic effect**

Full-text PDF:

<http://www.amjcaserep.com/fulltxt.php?ICID=882292>

Word count:

1185

Tables:

–

Figures:

–

References:

7

Author's address:

Gemenetzis Georgios, 69, Thessalonikis Str., 11851, Ano Petralona, Athens, Greece,
e-mail: georgegemen@gmail.com

BACKGROUND

Ecballium elaterium (squirting cucumber) is a weedy oval-shaped plant whose surface is covered with thorn-like hard cilia, widely known in the Mediterranean region. In traditional Mediterranean medicine, the extract of its roots and fruit has been used as a remedy for hundreds of years. It is reported to have cathartic, anti-inflammatory and analgesic effects and has been used with questionable results.

The extract is called *Elaterium*, comes from the fruit, leaves and roots of the plant, and it is obtained with an ethanol-based procedure. Its medicinal effects apply due to a substance called *elaterin* that precipitates over time. The range of clinical conditions treated with *Elaterium* is vast and includes constipation, jaundice, pulmonary edema, ascites and alopecia [1]. Mainly, though, it has been used in a diluted form to treat sinusitis [2].

When used without dilution the *E. elaterium* extract is considered highly toxic and cases of laryngeal edema, sensorineural hearing loss, acute glaucoma crisis, and heart and renal failure have been reported [3]. In this article, we present a case of severe uvular edema followed by hypoxemia due to a single use of *Ecballium elaterium* extract for treatment of sinusitis and we discuss safety issues in the use of this remedy, analyzing findings in the literature.

CASE REPORT

A 52-year-old male Caucasian presented to the emergency department with complaints of uvular edema, troubled breathing and retrosternal discomfort, which started a few hours before coming to the ER. The patient's medical history revealed the use of *Ecballium elaterium* extract in an undiluted form the same day. The patient used the extract once in the form of nasal drops in an unknown quantity, since it was presented to him from his social environment as a remedy for sinusitis. Further questions revealed that the patients suffered from chronic paranasal sinusitis. He has been treated during the previous year with antibiotics (macrolide) without a significant relief of his symptoms. The patient was asked if he had used that specific or any other similar non-prescribed substances in the past and he responded negatively. He also did not mention any previous allergic reactions to drugs whatsoever.

During the clinical examination a severe uvular edema was noted. The breathing sounds were normal in both lungs. There were not any other pathological findings in the systemic evaluation. Vital signs presented as follows: blood pressure 150/85 mm Hg, heart rate 90 bpm, temperature 37.2°C, respiration rate 16/min, and SatO₂ 87%. Due to low SatO₂ levels, a blood gas examination was performed. The results showed low pO₂ at 58 mm Hg, pCO₂ 35 mm Hg, pH 7.35 and HCO₃⁻ 25 mmol/l. As concluded from the lab results shown above, the patient had not established respiratory alkalosis, but had already shown the first signs of hypoxemia due to the uvular edema. Serological and chemical tests were also conducted and did not indicate any pathological values. The clinical status of the patient called for immediate treatment in order to reverse the effects of this particular substance and protect his respiratory function.

The patient was administered 35% O₂ through a Venturi mask to improve SatO₂ and pO₂ levels. Simultaneously, we administered 250 mg of Hydrocortisone (Solu-Cortef), 4 mg of Dimethindene Maleate (Fenistil) and 50 mg of Ranitidine (Zantac) intravenously. Through the Venturi mask, 1 dose of Salbutamol and Ipratropium (Berovent) and 1 dose of Budesonide (Pulmicort) were also administered to the patient in order to relieve the bronchial spasm. Almost half an hour later, the patient's clinical status had improved. He did not complain about troubled breathing and SatO₂ reached 92%. However, the uvular edema had not resolved fully. Due to the persistence of the edema, the patient was administered 25 mg Prednisolone (Prezolon) and 2 mg of Adrenaline through the Venturi mask in the form of an inhaled solution.

One hour after attendance to the ER, the uvular edema had significantly resolved and the patient's SatO₂ levels were back to normal (96%). Blood gas tests confirmed the improvement, with pO₂ levels at 82 mm Hg. The patient was admitted to the hospital for 24-hour surveillance. During his hospitalization, the patient was stable without any deterioration of his respiratory function or recurrence of the uvular edema.

DISCUSSION

Extract of *Ecballium elaterium* has been known as an anti-inflammatory agent in the Mediterranean region for many centuries and it has been used as a remedy against a vast spectrum of diseases, mainly against chronic and acute sinusitis. The effects of this particular extract are known empirically through time. The first attempt to prove *Ecballium elaterium*'s healing effect was made by Sezik et al. [4] who used it in a diluted form in a group of 49 volunteers with paranasal sinus infections. An appreciable percentage showed improvement of the symptoms (56–71%). In a later report Yesilada et al. [5] stated that the root of *Ecballium elaterium* had an inhibiting effect on the *in vitro* biosynthesis of IL-1 and TNF, which are known to be pro-inflammatory mediators.

The positive effects of *Ecballium elaterium* are seen only when it is used in diluted form, which reduces its efficacy by almost 10-fold. Use of undiluted extract can cause severe and possibly life-threatening adverse effects. The main mechanism depends on *elaterin* [6], which in high concentrations dramatically increases capillary permeability and causes watery evacuation of the mucosa. This effect can lead to severe edema of the nasal and pharyngeal mucosa and obstruct the respiratory tract. Kloutsos et al. [7] reported 42 exposures to *Ecballium elaterium* and more than 93% of the cases had a previous history of allergic reactions. Even higher concentrations of *elaterin* can cause neurotoxicity (in the form of convulsion or bradypnea), renal or heart failure, and death (doses over 1 g).

In the case presented, the patient did not mention any previous allergic reaction, or any previous use of *Ecballium elaterium* extract. He had used it, undiluted, in the form of nasal drops only once, on that specific day. This single use, though, resulted to a severe allergic reaction. The improvement of the symptoms with anti-allergic treatment indicates that the extract caused persistent irritation and

inflammation of the mucosal membranes. Only after the use of inhaled adrenaline was the patient fully relieved of his symptoms. Apparently, the concentration was not high enough to cause toxic effects, which could not be confronted with the treatment used. It should also be noted that the patient did not know of possible adverse effects from the use of *Ecballium elaterium*.

CONCLUSIONS

The use of *Ecballium elaterium* extract as a remedy can cause severe adverse effects that should not be ignored. Uvular edema is one of the most common of these and can lead, as shown above, to hypoxemia, which is a potentially life-threatening situation. Treatment is necessary and should include the use of high-concentration O₂ and inhaled adrenaline in order to secure the patency of the respiratory tract.

Consents

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Competing interests

The authors declare that they have no competing interests.

REFERENCES:

1. Eray O, Tuncok Y, Eray E et al: Severe uvular angioedema caused by intranasal administration of *Ecbalium Elaterium*. *Vet Hum Toxicol*, 1999; 41: 376–78
2. Satar S, Gokel Y, Toprak N, Sebe A: Life-threatening uvular angioedema caused by *Ecbalium Elaterium*. *Eur J Emerg Med*, 2001; 8: 337–39
3. Koussidis GA, Mountantonakis S, Petrichou CC: Folk remedies still in use: a case of soft palate and uvular edema due to *Ecbalium Elaterium*. *Int J Clin Pract*, 2002; 56: 817
4. Sezik E, Yesilada E: Clinical effects of the fruit juice of *Ecbalium Elaterium* in the treatment of sinusitis. *J Toxicol Clin Toxicol*, 1995; 33: 381–83
5. Yesilada E, Ustun O, Sezik E et al: Inhibitory effects of Turkish Folk remedies on inflammatory cytokines: interleukin-1alpha, interleukin-1beta and tumor necrosis factor alpha. *J Ethnopharmacol*, 1997; 58: 59–73
6. Cenker E, Kerem Ozbek, Canan K, Oktay E: Severe uvular edema and nasal mucosal necrosis due to *Ecbalium Elaterium* (squirting cucumber): an allergic reaction or direct toxic effect? *Clin Toxicology*, 2008; 46: 257–58
7. Kloutsos G, Balatsouras DG, Kaberos AC et al: Upper airway edema resulting from use of *Ecbalium Elaterium*. *Laryngoscope*, 2001; 111: 1652–55