Case Report

Toxic encephalopathy after *Atropa belladonna* poisoning

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ABSTRACT

An altered mentality is a common medical condition in emergency medicine. Among the causes of this, toxic etiology due to a herbal medicine is not rare. This article reports a case who was brought to emergency department because of the anticholinergic syndrome. He displayed psychomotor agitation, confusion, flushed and warmed skin, urinary retention, dry mouth and dilated pupils within 3 hours of ingesting of a plant, *Atropa belladonna*, which has been used as a traditional folk remedy for relieving peptic ulcer disease. He was discharged with a complete recovery after only receiving supportive therapy. Physostigmine, a cholinesterase inhibitor, was not used because of the self-limiting course. Physicians should be mindful of an anticholinergic syndrome due to herbal medicine when a patient with a history of altered mental status come to emergency department.

KEY WORDS: *Atropa belladonna*, Anticholinergic agents, Plant poisoning, Neurotoxicity syndromes, Toxic encephalopathy.

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INTRODUCTION

Plants from the Solanaceae group have been used as cosmetic, traditional medicine or poison since ancient times. Deadly nightshade (*Atropa belladonna*) is one of the plant of this group. The name Atropa is thought to be derived from that of the Greek goddess Atropa. The name "belladonna" comes from the Italian language, meaning "beatiful lady" orginating either from its usage as cosmetic for the face or more probably from its usage to increase the pupil size in ladies. Its roots, leaves and fruits contain tropane alkaloids with significant anticholinergic activity in humans.[1]

Atropa belladonna intoxication has been infrequently reported in both children and adults in the literature. The berries pose the greatest danger to children because they look attractive and have sweet taste. The majority of cases occur in children younger than 6 year. Incidental or intentional ingestion of a single leaf of the plant can cause variable anticholinergic symptoms even be fatal.[2]

This article demonstrates a case of toxic encephalopathy developed after taking *Atropa belladonna* to treat peptic ulcer disease.

CASE REPORT

A healthy 40-year-old man without history of addiction was brought to emergency department with the symptoms of sudden disorientation and psychomotor agitation who was not responding appropriately to the questions being asked within 3 hour.

On arrival, vital signs were 180/100 mmHg for blood pressure, 140-150 beats/min for heart rate, 24

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breaths/min for respiratory rate and a temperature of 38°C. The airway was intact and pulse oximetry showed oxygen saturation 98%. The heart rate was fast and regular without ectopic beats or murmurs. There was sinus tachycardia on the monitor. The abdominal exam was significant for hypoactive bowel sounds. Pupils were equal mydriatic with poorly responsive to light. His skin was flushed and warm, the tongue was very dry and chapped. Mild bladder distention was noted. Brain computed tomography taken in emergency room showed no abnormality which may have caused mental change. All laboratory studies were in normal ranges. On neurological examination, the patient was awake but disorientated and no gross neurological deficit was present.

Asking about recent medication history from family members revealed that he used herbal medicine by himself at home for relieving chronic peptic ulcer disease. They brought samples of this plant assuming that the behavior of the patient could be because of poisoning with this plant. It was confirmed as dried leaves of deadly nightshade.

The patient was diagnosed with anticholinergic intoxication. Due to the apparent acute anticholinergic intoxication with the altered mental status, he was initially treated with orally activated charcoal administration (1g/kg). Intermittent intravenous administration of 10 mg diazepam for agitation was given. Following gastric decontamination, supportive treatment, carefully monitoring of the cardiorespiratory status and maintenance of fluid and electrolyte balance were applied. Agitation and confusion incrementally ameliorated. Physostigmine was considered but because of the self-limiting and good clinical course it was not administered. Subsequent biochemical, blood count parameters and vital signs were unremarkable. The patient was discharged without permanent sequelae after a symptom-free period of 6 hours without use of supportive therapy.

DISCUSSION

Atropa belladonna is one of the species of nightshade that contains tropane alkaloids. It has been used in traditional treatments for centuries for an assortment of conditions including headache, chronic bronchitis, menstrual symptoms, peptic ulcer, histaminic reaction, inflammation and motion sickness.

Worldwide incidence of this toxic presentations from this remedy is unknown, with clusters of poisoning cases, mostly among adolescents using plants for their hallucinogenic effects. According to the American Association of Poison Control Center's National Poison Data System Annual Report 2007, 938 exposures to anticholinergic plants were reported and no deaths were documented.[3]

Oral intake of the plant may induce an anticholinergic effects since it includes atropine, scopolamine and hyoscyamine. The estimated lethal dose of atropine and scopolamine in adults are 10 or more and more than 2-4 mg, respectively. Symptoms of toxicity usually occur within 30-60 minutes after ingestion and may continue for 24-48 hours because the alkaloids delay gastric emptying and absorption.

The typical toxic symptoms are similar to that seen in case of atropine poisoning and include both peripheral (dry mucosa, flushed skin, mydriasis and blurred vision, thirst, swallowing difficulty, photophobia, urinary retention and tachycardia) and central (agitation, combative behavior, hallucination, delirium, seizure and coma) anticholinergic manifestations.[4]

Plasma levels of atropine or muscarinic receptor binding equivalent which is used as an index of anticholinergic activity by using radio receptor technique may be useful in confirming the cause and severity of intoxication.[5] However, in this case report, the laboratory confirmation of atropine poisoning could not be done because of the inadequate facilities.

Treatment consists of supportive care and gastrointestinal decontamination such as gastric lavage and taking activated charcoal to prevent absorption for early presentation. Benzodiazepines can be used to treat delirium, agitation and especially tropane-alkaloid-induced seizures.

Clinicians do not recommend routine use of physostigmine in *Atropa belladonna* exposures. Because majority of these intoxications are self-limiting and respond to supportive therapy. Most patients can be safely treated without this antidote like in this case.

Physostigmine, a cholinesterase inhibitor that acts both the peripheral and central nervous systems to antagonize muscarinic inhibition, may be considered for life-threatening anticholinergic crisis. It generally should be used only for the patients who are unresponsive to supportive measures, have tachydysrhythmias with hemodynamic compromise, intractable seizures unresponsive to benzodiazepines or extremely severe agitation or hallucinations unresponsive to other therapy. Physostigmine should be given very slowly because of the potential for life-threatening cardiovascular adverse effects with an initial dose of 1-2 mg for adults. The dose may be

repeated as indicated; clinical effects last 20-60 minutes.[6]

CONCLUSION

This article reports a case of toxic encephalopathy due to herbal medicine, which is presented as typical anticholinergic symptoms after taking dried leaves of *Atropa belladonna*. It is important to understand and recognize the anticholinergic syndrome caused by such intoxication in order to make a proper diagnosis, avoid unnecessary testing and provide expedient appropriate treatment when required. Because of this, physicians of emergency medicine should be alert to the possibility of this condition with a history of a patient with delirious behavior and mental status change come to hospital.

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