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Case Report

A CASE REPORT OF CARDIOTOXICITY DUE TO HOMEOPATHIC DRUG OVERDOSE

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ABSTRACT

Aconite is one of the most toxic plants. Aconitine and related alkaloids found in the *Aconitum* species are highly toxic cardiotoxins and neurotoxins. Severe aconite poisoning can occur after accidental ingestion of the wild plant or consumption of an herbal decoction made from aconite roots. The toxic components of *Aconitum* as aconitine and related alkaloids cause cardiotoxicity, neurotoxicity and gastrointestinal toxicity through their actions on sodium channels. Cardiac manifestations include hypotension and ventricular tachyarrhythmias. Ventricular tachyarrhythmias and refractory cardiovascular collapse, such as in the case of this patient account for life-threatening toxicities in severe aconite poisoning. In general, vagal slowing is seen in 10 to 20% of fatal intoxications. If higher concentrations are present, supraventricular tachycardia, ventricular tachycardia, torsades de pointes, and other conduction disturbances may be seen. Ventricular fibrillation may be seen, and is often the cause of death. Available clinical evidence suggests that drugs like amiodarone and flecainide are reasonable first-line treatment.

Keywords: Aconite, cardiotoxicity, Neurotoxicity, Ventricular tachyarrhythmias.

INTRODUCTION

Aconite has long been used in the traditional medicine of Asia (India, China) *Aconitum ferox* (Vatsanabha) is one of the deadliest poisons in Ayurveda. It is categorized in Mahavishavarg in all Ayurvedic texts¹. In Asia most aconite poisoning cases are related to the use of *Aconitum* rootstocks in traditional medicine². Extracts of the plant are also used in homeopathy to decrease fever, as cardiac depressant, and to treat neuralgia³. There were over 600 reported cases of poisoning in China alone up to 2006, and in Hong Kong It was estimated that 75% of Chinese herbal medicine related hospital admissions were related to aconite toxicity⁴. In this article we

report a case of aconite induced cardiotoxicity that was managed in our hospital.

CASE REPORT

A 35 yrs old female brought by relatives with presenting complaints of nausea, epigastric pain and severe vomiting since morning on the day of admission.. She was referred from surgery OPD as her pulse was rapid and irregularly irregular. Patient advised medicine reference for tachycardia and irregular pulse. On examination, Pulse was 150/min, low volume, irregularly irregular. Blood pressure was 80 systolic mm of Hg. On auscultation S1, S2 heard. No cardiac murmur. ECG suggestive of Bidirectional

ventricular tachycardia(Fig 2). 2DECHO screening done in OPD there was normal. Patient admitted in Intensive care unit. Emergency cardioversion was done with 360 J for ventricular tachycardia but it didn't revert. Inj. Amiodarone 300 mg. iv. bolus was given and sinus rhythm was achieved(Fig 3). patient was then put on i.v. Amiodarone 1gm infusion for 24 hrs. Hypotension responded to fluid therapy and supportive care. However, patient had intractable vomiting for 3 days, which was treated with inj Ondansetron 4 mg and i.v. fluids for dehydration.

Detailed history given by patient suggestive of consumption of Mother Tincture (Aconite Radice Preparation) about two teaspoonful for pain abdomen and gall stones, and followed by above symptoms after 1-2 hour of consumption. (Bottle presented by the patient)(Fig 1b) prescribed by homeopathic doctor. The patient was not advised regarding frequency, quantity and dilution of the drug.

Patient responded to intravenous antiarrhythmic drug (Inj. Amiodarone). But intermittent multiple ventricular ectopics were observed till next day. Fluid resuscitation was done and hemodynamic stability maintained with supportive care.



Fig 1: a) Aconitum Plant b) Mother Tincture presented by Patient

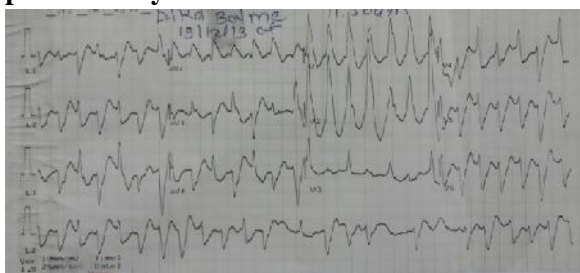


Fig 2: ECG on admission suggestive of Bi-directional ventricular tachycardia

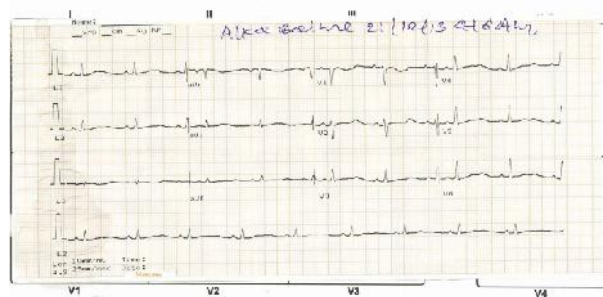


Fig 3: ECG on discharge Normal Sinus Rhythm

Other routine laboratory investigations (LFT, RFT, and Chest X-Ray) are within normal limit. Patient treated successfully and discharged on 5th day.

DISCUSSION

Homeopathy has a holistic approach to healing, with as its central tenet that “like cures like”. Established in 1796 by the German physician Samuel Christian Hahnemann, it treats patients with heavily diluted preparations of substances which in their undiluted form are thought to cause effects similar to the symptoms presented. Homeopathic medicines are in general considered to be safe when administered appropriately, toxicological aspects should not be neglected, especially when using lower dilutions of unsafe starting material⁵.

Aconite is a well known toxic plant of the genus *Aconitum* in the Ranunculaceae family. Aconite related alkaloids such as aconitines, benzoylaconines and aconines, and the aconitines (aconitine, hyaconitine, jesaconitine and mesaconitine) are the causative agents of Aconite poisoning⁶. Aconitum alkaloids are the active ingredients and the source of toxicity. The amount and type of aconitum alkaloids are the main factors determining the severity of intoxication. For the same plant, the level of active ingredient is affected by the time of harvest and method of processing. The tuberous roots of genus *Aconitum* are commonly applied for various diseases. These tubers of *Aconitum* are used in the herbal medicines only after processing⁷. Soaking and boiling during processing or decoction preparation will hydrolyze aconite alkaloids into less toxic and non-toxic derivatives^{8,9}. The detoxification induced a change in the structure of aconitine making it less cardio-toxic¹⁰. However, the use of a larger than recommended dose and inadequate processing increases the risk of poisoning.

Typical manifestations of poisoning are gastrointestinal, neurological, and cardiovascular, with malignant ventricular arrhythmias¹¹. The neurological features could be sensory symptoms like tingling or numbness or motor like weakness in one or all limbs. The cardiovascular manifestations are chest pain, shock and palpitations due to various ventricular and supraventricular tachycardias. The gastrointestinal features are similar to any other toxin like nausea, vomiting, pain in abdomen and diarrhoea. Death occurs usually due to refractory ventricular tachycardia or ventricular asystole. The reported overall in-hospital mortality is 5.5%. Aconitine can also cause BiVentricular Tachycardia¹².

The toxic effects on heart and nervous system of aconitine and similar alkaloids are due to action on voltage sensitive sodium channels of above tissues. Aconitine binds to the open state of the voltage-sensitive sodium channel and inhibits its inactivation. Aconitine will induce arrhythmias after the fiber has been completely repolarised. This arrhythmia is generally facilitated in the presence of high Ca^{++} solution, yet the aconitine-induced arrhythmia occurs even in the presence of low Ca^{++} solutions. Thus intracellular Na^{+} loading plays an important role in the aconitine-induced delayed afterdepolarization and transient inward currents in low Ca^{++} solution. The consequent prolonged inward current of the sodium channel leads to intracellular accumulation of Na^{+} and activates the Na^{+} - Ca^{++} exchanger, causing Ca^{++} overload and delayed afterdepolarization. Several reports suggest that delayed after depolarization has an important role in triggering and maintaining BiVentricular Tachycardia¹².

Management of aconite poisoning is supportive, including immediate attention to the vital functions and close monitoring of blood pressure and cardiac rhythm. Extensive vomiting and diarrhoea may require that fluid and electrolytes be monitored and replaced as necessary. Inotropic therapy is required if hypotension persists. Ventricular arrhythmias caused by aconite toxicity are refractory to both electrical and chemical cardioversion. In such cases it is important to maintain basic life support and early use of cardiopulmonary bypass. Antiarrhythmics like Amiodarone and Flecainide are reasonable first-line drugs as per presently available evidence.¹³

CONCLUSION

This case report emphasises the importance that there may be many more cases of acute aconite toxicity which must be going unnoticed due to consumption of toxin in inappropriate dilution, form or as herbal drug. Homoeopathy is the method of treating an ailment caused by injurious toxic substances with the same or similar substances given in an extremely diluted form. It is absolutely essential that the poison of the like thereof be diluted to the extent that it causes no harm to the body. One should advise patients regarding quantity and dilution of the drug while prescribing homeopathic medication.

Detailed history, clinical examination, early management of ventricular tachycardia and supportive intensive care management in case of aconite induced cardiotoxicity help to treat patients successfully.

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