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# Poisoning Watch

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## Aconitine poisoning



### Introduction

In Hong Kong, seeking medical treatment from Chinese medicine practitioners or taking Chinese medicines among the general public is common. According to statistics from the Thematic Household Survey Report No. 45 published by the Census and Statistics Department<sup>1</sup>, about 22% of the general population had consulted a healthcare professional during the 30 days before the survey and 15% of these consultations involved practitioners of Chinese medicine. Chinese medicines are safe under proper use and supervision. Nonetheless, certain Chinese medicines may pose risk of poisoning when used improperly. In this issue, we talk about aconitine poisoning (烏頭鹼中毒) related to improper use of Chinese medicines.



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<sup>1</sup> Available from: [http://www.statistics.gov.hk/publication/stat\\_report/social\\_data/B11302452010XXXXB0100.pdf](http://www.statistics.gov.hk/publication/stat_report/social_data/B11302452010XXXXB0100.pdf)

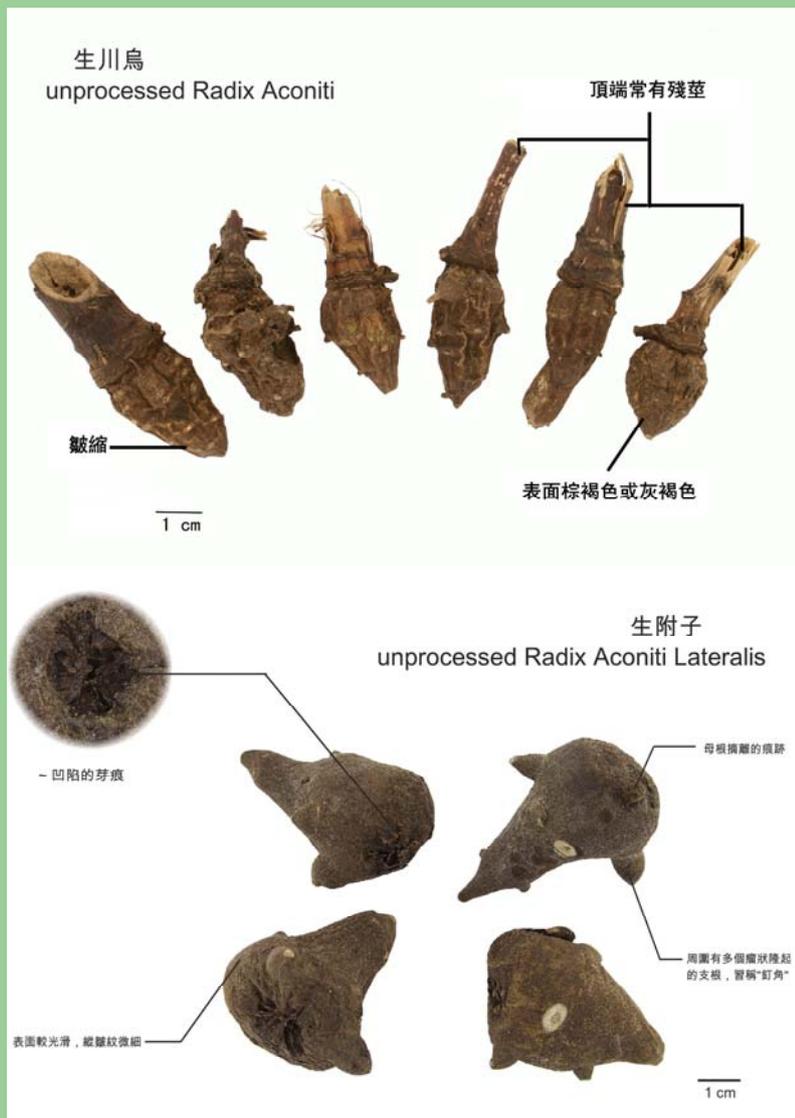




## Which Chinese medicines may cause aconitine poisoning?

Aconitine poisoning may result from improper intake of Chinese medicines containing aconitum alkaloids (烏頭類生物鹼). The commonly encountered aconitum alkaloids are aconitine, mesaconitine and hyaconitine, while yunaconitine and crassicauline A are more potent ones. All can cause toxic side effects on the cardiovascular and nervous systems.

### Unprocessed or raw forms of aconite root tubers



Chinese medicines containing aconitum alkaloids are made from dried root tubers of certain specific species of Aconitum plants. The commonly prescribed Chinese medicines belonging to this genus include Radix Aconiti (川烏), Radix Aconiti Kusnezoffii (草烏) and Radix Aconiti Lateralis (附子). The aconitum alkaloids are the active ingredients but also the incriminated agents for toxicity. The amount and composition of different kinds of aconitum alkaloids vary, depending on the species, medicinal part of plants, place of origin, time of harvest, method of processing, etc.



Unprocessed or raw forms of aconite root tubers are very toxic and must be used with extra caution. In general, unprocessed aconitine-containing Chinese medicines can only be prescribed for external indications under limited dosage. As such, the unprocessed forms of the above three Chinese medicines are listed in Schedule 1 of Chinese herbal medicines under the Chinese Medicine Ordinance (Cap 549), which can only be prescribed and dispensed by a registered Chinese medicine practitioner (註冊中醫). Besides, they are contraindicated in pregnancy. Only the processed forms are safe for consumption but poisoning may still occur if they are used inappropriately.

Certain medicinal plants may contain the more potent aconitum alkaloids, such as yunaconitine and crassicauline A. These include *Radix Aconiti Austroyunnanensis* (小黑牛), *Radix Aconiti Forrestii* (黃草烏), *Radix Aconiti Sungpanensis* (火焰子), etc. However, they are rarely used in Hong Kong.

## What are the indications of processed aconitine-containing Chinese medicines and what precaution measures are required?

Chinese medicines containing aconitum alkaloids have analgesic effects. They are usually used in treating musculoskeletal disorders, painful conditions, etc. According to the Pharmacopoeia of the People's Republic of China 2010, the recommended dosage for processed *Radix Aconiti* (製川烏) and processed *Radix Aconiti Kusnezoffii* (製草烏) is ranged from 1.5 grams to 3 grams (i.e. 0.5 – 1 mace) and that for processed *Radix Aconiti Lateralis* (製附子) is ranged from 3 grams to 15 grams (i.e. 1 – 5 maces). They should be used cautiously among people susceptible to adverse effects, such as pregnant women



and people with chronic diseases. People who are taking antihypertensive agents or drugs for irregular heartbeats should inform their Chinese medicine practitioner to avoid possible drug interaction.

### Processed aconite root tubers

製草烏

Processed Radix Aconiti Kusnezoffii



製附子(黑順片)

processed Radix Aconiti Lateralis



Concerning the preparation process of decoction, the first step is quick washing and adequate soaking of the Chinese medicines in water so as to remove foreign matters and impurities. For aconitine-containing Chinese medicines, additional boiling for prolonged time (at least 1.5 - 2 hours) is necessary before preparing a decoction with other Chinese medicines in order to reduce the toxic alkaloid content. This procedure will hydrolyze aconitum alkaloids into less toxic derivatives. This pre-decoction boiling method is referred as “先煎” in Chinese medicine terminology. It is marked beside the particular Chinese medicines in the prescription sheets and specified in boiling instructions.



## Clinical features and treatment of aconitine poisoning

Patients suffering from aconitine poisoning usually have acute onset of illness within a short period after consumption of the herbal decoction, ranging from half an hour to several hours. The main presenting symptoms are related to the cardiotoxic and neurotoxic effects. Cardiovascular symptoms include low blood pressure, slow heart rate, irregular heart rate (arrhythmia) and palpitation. Neurological features include numbness involving the oral cavity, tongue, face, extremities and body, muscle weakness of the limbs and dizziness. Patients may experience gastrointestinal upset like nausea, vomiting, and less often abdominal pain and diarrhoea. Life-threatening breathing difficulties and arrhythmia might occur in severe cases.

There is no specific treatment or antidote. Patients may be offered supportive management according to the clinical condition. Close monitoring of blood pressure and cardiac rhythm is required. In general, patients who have recovered from the poisoning are expected to be symptom-free and would not develop any long-term consequence.

## Local situation of aconitine poisoning

In 2008, 2009 and 2010, a total of 21, 20 and 17 confirmed cases were reported to the Department of Health respectively. Their age ranged from 13 years to 85 years (median: 52 years). More females were affected than males with a male to female ratio of 1:1.8. Among these 58 patients, 52 (90%) required hospitalization. No fatal case was recorded. The most frequently encountered Chinese medicine was Radix Aconiti Lateralis (附子) which involved about 55% of the cases. The remaining cases were associated with other herbs or proprietary Chinese medicines (pCm). The underlying causes identified included:



- ⇒ factors related to Chinese medicines such as variable content of aconitum alkaloids in the Chinese medicines, contamination, confusion of plant species, etc.;
- ⇒ prescription and dispensing factors such as overdose, misuse, dispensing error, etc.;
- ⇒ inadequate preparation or decoction; and
- ⇒ susceptibility of individual patients to adverse effects.

### What you should do to prevent aconitine poisoning?

Most importantly, people should exercise care in the use of aconitine-containing Chinese medicines because of the narrow difference between therapeutic and toxic dosage levels. Moreover, the appropriate combination of different types of Chinese medicine is of paramount importance. According to the theory of Chinese medicine, aconitine-containing herbs are incompatible with several particular types of Chinese medicines such as *Rhizoma Pinelliae*. Therefore, before purchasing Chinese medicines, people should understand their own health problems and the nature and suitability of the medicines to be consumed by seeking advice from Chinese medicine practitioners. People are advised to strictly follow their Chinese medicine practitioner's instructions on preparation/decoction and consumption of any Chinese medicines and not to adjust the dose, composition and preparatory method by themselves. Besides, they should retain the written prescription/formula after each consultation. If people feel unwell or are in doubt after taking the Chinese medicines, they should consult healthcare professionals immediately.





People should not purchase Chinese medicines or prepare formulation themselves for any illness without consulting a Chinese Medicine practitioner. Also, people should neither consult unqualified Chinese medicine practitioners nor purchase any Chinese medicines/pCm from unknown or doubtful source. All Chinese medicines should be purchased from reliable retailers.

For more information about safe use of Chinese medicines, please visit the website of the Chinese Medicine Division of the Department of Health at [http://www.cmd.gov.hk/html/b5/health\\_info/health\\_info.html](http://www.cmd.gov.hk/html/b5/health_info/health_info.html).



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