

Anaphylactic shock and lethal anaphylaxis caused by *Houttuynia Cordata* injection, a herbal treatment in China

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Key words: anaphylactic shock; herbal treatment; *Houttuynia Cordata* injection; lethal anaphylaxis.

Houttuynia Cordata injection (HCI) is the administration of a herbal extract of sterile volatile oils from distillation of fresh *H. Cordata* with a milliliter equivalent to 2 g of herbal materials(1). It

Severe allergic shock and fatality caused by the herbal treatment with *Houttuynia Cordata* injection.

was widely used in China to treat various diseases because of its antibiotic, anti-viral, anti-inflammatory and immunity-improving effects (1). *Houttuynia Cordata* injection was estimated to have been used 280 million times in China in 2005 (1). This extensive herbal treatment is accompanied by a substantial incidence of life threatening anaphylaxis (1).

We analyzed 30 articles describing cases of anaphylactic shock and lethal anaphylaxis caused by HCI. The articles were collected from medical journals published in China from 1980 to 2007. Collectively, they report 39 episodes of anaphylactic shock and five deaths (2–6).

Four of the five lethal anaphylaxis incidences occurred following intravenous injection (IVI) and one following intramuscular injection (IMI). The patients' ages ranged from 5 to 57 years (Table 1) (2–6). They were hospitalized for upper respiratory tract infection

(URTI, $n = 3$), bronchitis ($n = 1$) and chronic eczema ($n = 1$) (2–6). When allergic reactions to HCI occurred, epinephrine was injected immediately; however, it failed to save their lives (2–6). The interval between HCI and the time of death ranged from 0.25 to 72 h (2–6).

Among the 39 anaphylactic shock cases, eight (20.5%) patients were given an IMI and 31 (79.5%) were given an IVI. Their ages ranged from 2.4 to 75 years. They were seeking treatment for URTI ($n = 19$), acute bronchitis ($n = 7$), tonsillitis ($n = 7$), acute gastroenteritis ($n = 2$), pneumonia ($n = 1$), acute pelvic inflammatory disease ($n = 1$), otitis media ($n = 1$) and chickenpox ($n = 1$). Abnormalities were noticed from several seconds to 20 min post-HCI.

Among the patients who suffered anaphylactic shock, a 12-year-old girl

Table 1. Five cases of fatal anaphylaxis caused by HCI in China

References	Sex: age (years)	Date	Allergy history	Presenting condition	Mode of delivery	Post-HCI symptoms	Onset of symptoms (min)	Diagnosis	Timely epinephrine	HCI to time of death interval
(2)	1 female: 5	9/1/2006	Yes	Bronchitis	IVI	AP, DH, D, FC, H, HS	2	anaphylactic shock	Yes	30 min
(3)	1 male: 26	–	None	upper respiratory tract infection	IVI	DH, D, H, V, UC	60	anaphylactic shock	Yes	< 2 h
(4)	1 male: 57	29/9/2005	None	chronic eczema	IVI	MN, PR, F, LC, CE, H	1	anaphylactic shock	Yes	100 min
(5)	1 male: 46	3/1/2004	–	upper respiratory tract infection	IVI	LLP, LN, FS, CE, UC, H	120	allergic thrombocytopenic purpura, acute liver/renal dysfunction and intracranial hemorrhage	Yes	72 h
(6)	1 male: 54	27/3/2003	–	upper respiratory tract infection with fever (38°C)	IMI	D, V, HA, H, P	< 0.5	anaphylactic shock	Yes	15 min

(–), data not shown; AP, abdominal pain; CE, cool extremities; D, dyspnea; DH, dysphoria; F, fainting; FC, facial cyanosis; FS, facial suffocation; H, hypotension; HA, headache; HCI, *Houttuynia Cordata* injection; HS, hyperspasmia; IMI, intramuscular injection; IVI, intravenous injection; LC, lip cyanosis; LLP, lower limb pain; LN, limb numbness; MN: mouth numbness; P, pale; PR, pruritus; UC, unconsciousness; V, vomiting.

with an URTI had no reaction following one IMI, but then presented with anaphylactic shock just 15 min after receiving a second injection. In another case, a 12-year-old boy with an URTI showed no allergic reaction after two IMIs, but then presented with anaphylactic shock just 5 min after receiving a third injection. A 26-year-old pregnant woman at 29 weeks gestation with an URTI and no history of drug allergies presented with anaphylactic shock just 5 min after HCI. Likewise, a 22-year-old Iranian woman with no history of drug allergies was seeking treatment for an URTI when she suffered severe anaphylactic shock just 2 min after receiving intravenous HCI. She was rescued by epinephrine within 10 min and was the first known foreign victim of HCI-induced anaphylaxis in China. All 39 patients were rescued without sequelae.

The instability of houttuynate, a major active ingredient in HCI, may underlie HCI hypersensitivity (1). The human metabolism patterns of numerous other potentially allergenic constituents such as lauryl aldehyde, caryophyllene, linalool etc., in HCI have not been defined (1). Furthermore, interactions with other medicines or impurities within the extract may play a role in HCI-induced allergic reactions (1).

The Chinese National Adverse Reaction Monitoring Center reported over 5000 adverse reactions to HCI from January 1988 to April 2006 including 222 serious cases. The State Food and Drug Administration of China (SFDA) halted the use of HCI in hospitals in June 2006. After re-examining HCI manufacturing conditions and quality control, the SFDA gave permission to few manufacturers to recommence HCI production. An allergen-warning label was added to the product. The SFDA is developing an HCI fingerprint to control its production quality and thus improve its safety.

In summary, our findings suggest that HCI should not be given to children, pregnant women, or patients only with common colds. A skin test may help in identifying allergic patients. It would be of interest to examine HCI in diseases with no definitive cure, such as severe acute respiratory syndrome.

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Accepted for publication 29 September 2008
Allergy 2009

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DOI: 10.1111/j.1398-9995.2009.01942.x

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