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Inside This Issue

Welcome to the first issue of the Poisoning.Comm! Poisoning.Comm is a new online publication by the Department of Health. It is dedicated to raising the awareness amongst local healthcare professionals on poisoning. It will be published quarterly. The theme of this issue is poisoning in children. Do you know what medications can cause fatality to children on accidental poisoning? Is Quinine the same as Quinidine? What to do if a baby is poisoned with a nose drops? We invite you to read on and find out!

Dr TH Leung
Deputy Director of Health

Hong Kong Poisons Information Centre

The Hong Kong Poisons Information Centre (HKPIC), jointly established by the Department of Health, Hospital Authority, and the Drugs and Poisons Information Bureau of The Chinese University of Hong Kong, has commenced operation since July 2005. Manned by medical personnel specially trained in clinical toxicology, the HKPIC provides health care professionals with information and advice on the diagnosis and management of acute and chronic poisoning by drugs, chemicals, household products, health products, herbal medicines or natural toxins.

In its initial stage of operation, the HKPIC provides urgent consultation service by phone during the operating hours, while non-urgent consultations and enquiries can be made by facsimile or E-mails at any time.

The hours of operation and contact details of the HKPIC are as follows:

Operating hours	9 am to 9 pm Daily
Telephone	2635 1111
Facsimile	3513 5649
E-mail	poisoninfo@ha.org.hk

Please feel free to contact Dr FL LAU, Director of the HKPIC at 35135089 for matters related to the HKPIC.

衞生署
Department of Health

醫院管理局
HOSPITAL AUTHORITY

Small Doses, Big Problems - Medications That Are Highly Dangerous To A Toddler

Professor Thomas Y.K. Chan, Director of Centre for Food and Drug Safety, Faculty of Medicine, The Chinese University of Hong Kong

In accidental poisoning in children, the 2-year-olds are the most commonly involved. Exposure to poisons occurs predominately at home. Product accessibility is by far the most important factor. Easily visible or accessible storage locations such as the floor, table top, fridge, kitchen cupboard and handbag increase the risk of accidental poisoning. Medications should always be safely packed and stored. The giving of precautionary advice to parents should also help reduce the incidence of childhood poisoning. The list of medications that can cause fatalities in toddlers with 1-2 dose units includes antimalarials, calcium channel blockers, tricyclic antidepressants, antipsychotics, narcotic analgesics, bronchodilators, sulphonylureas and topical analgesics (see Table below). Physicians should be familiar with this list of medications which are extremely dangerous for toddlers, as well as the management of such poisoning.

Table - Medications that can be fatal to a 10 kg toddler upon ingestion of a small dose.

Medication	Pharmacological classification or Indication	Major toxic effects
Chloroquine Hydroxychloroquine	Antimalarial	Cardiac arrhythmias, seizures, coma, respiratory arrest
Quinine	Antimalarial Nocturnal leg cramping	Cardiac arrhythmias, seizures, coma, hypoglycaemia, visual damage
Quinidine (d-isomer of quinine)	Anti-arrhythmic Antimalarial	Cardiac arrhythmias, seizures, coma
Verapamil Diltiazem	Calcium channel blocker	Hypotension, bradycardia, heart block, cerebral hypoperfusion
Amitriptyline Desipramine Imipramine	Tricyclic antidepressant	Cardiac arrhythmias, respiratory failure, coma, anticholinergic effects
Chlorpromazine Thioridazine	Antipsychotic	Cardiac arrhythmias, seizures, dystonic reactions
Codeine Methadone Morphine	Narcotic analgesic	Coma, respiratory depression
Theophylline	Bronchodilator	Cardiac arrhythmias, seizures, profound hypokalemia
Chlorpropamide Glibenclamide	Long-acting sulphonylurea	Prolonged hypoglycaemia
Camphor	Liniment for muscle aches	Rapid-onset neurotoxins with both excitatory and depressant actions
Methyl salicylate	Topical analgesic	Rapid-onset, severe salicylate poisoning
"Red Flower Oil" (contains methyl salicylate)	Topical analgesic	Rapid-onset, severe salicylate poisoning

Toxicity Arising From Confusions – Quinine vs. Quinidine

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"Look-alike / Sound-alike"

Toxicity of drugs does not always arise from overdosing, but also from occasions when a wrong drug is erroneously prescribed or dispensed to a patient. Many errors are caused by confusions dealing with look-alike and sound-alike drugs. Quinine and Quinidine are look-alike (when written) and sound-alike (when pronounced) medications. When we mistakenly add an **"id"** to Quinine, it becomes Quin-**id**-ine. Despite the similarity in their names and pronunciations, their usages are entirely different. Quinine is commonly used for malaria and leg cramping, and Quin-**id**-ine is an anti-arrhythmic agent. Erroneous substitution by one or the other in prescribing or dispensing can lead to not just medication errors, but also serious toxicities.

Both Quinine and Quin-**id**-ine are highly toxic compounds. They can cause adverse effects in susceptible patients even in therapeutic doses. For instance, if a prescriber mistakenly prescribes "Quin-**id**-ine bisulphate 250mg to be taken 3 times daily" instead of "Quinine bisulphate 300mg at bedtime" for leg cramps to a patient with heart failure or heart block, this can result in life-threatening consequence.
The summaries of the toxicities of Quinine and Quin-**id**-ine are appended below as quick reference.

Quinine (1,2,3)

Indications:
★ chloroquine-resistant and multidrug-resistant falciparum malaria
★ nocturnal leg cramps (night cramps)

Clinical features in overdose:
★ Cinchonism: nausea, vomiting, tinnitus, deafness, headache, vasodilatation and slightly disturbed vision.
★ Quinine blindness (amblyopia) appears in 20 – 40% of acute overdoses with a mean time of onset of 9 hours post-ingestion.(2)
★ CNS depression, coma and convulsions.
★ In general, the cardiac effects of Quinine in overdose are less severe than those of Quin-**id**-ine (its optical isomer).

Commercial products:
★ Quinine sulphate 200mg and Quinine bisulphate 300mg

Toxic dose:
★ Adults: 2.5 – 4gm
★ Children: >25mg/kg
(In fact, Quinine is one of the very few drugs that can cause **potential fatality for a 10kg toddler** on ingestion of only **"one dose"** of commercially available product.(2) Thus, parents are reminded to store this drug in child-proof containers and keep away from the reach of their children when they have elders at home taking Quinine bisulphate 300mg at bedtime for night cramps.)

Quin-id-ine (1,2,3)

Indications:
★ maintenance of sinus rhythm, in patients with atrial fibrillation
★ prevention of recurrence of ventricular tachycardia or ventricular fibrillation
★ Treatment of malaria when quinine is not immediately available (4)

Clinical features in overdose:
★ Cardiac effects: bradycardia, prolongation of the PR interval, lengthening of the QT interval, widening of the QRS with development of an idioventricular rhythm. Ventricular fibrillation may sometimes follow.
★ Blood pressure decreases progressively and hypo-kalemia may occur.
★ Syncope and convulsion.

Commercial products:
★ Quin-**id**-ine bisulphate 250mg in sustained release form

Toxic dose:
★ Adults: 3 – 4gm (40 – 50 mg/kg)
(Doses over 1gm may cause symptoms, especially in chronic heart failure. Concurrent use of beta-blockers and tricyclic antidepressants may precipitate Quin-**id**-ine toxicity.)
★ Children: 50 – 100 mg/kg

Management in Quinine and Quin-id-ine Overdose
★ Supportive and symptomatic measures including maintenance of the airway, breathing and circulatory status of the patient and observation for dysrhythmia. Clinical assessment for signs of seizure activity is also important.
★ Gastrointestinal decontamination with activated charcoal should be instituted to all patients in overdose. Repeated doses may increase clearance of the drugs.(1,2)
★ No antidote is available for Quinine and Quin-**id**-ine.

References
1. International Programme on Chemical Safety: INCHEM – Poisons Information Monographs on Quinine & Quinidine
2. Whyte IM. Ch94: Antimalarial agents. In: Dart RC et al (Eds). Medical Toxicology. 3rd edition. Philadelphia: Lippincott Williams and Wilkins; 2004. p466-74
3. Drugs & Therapy Perspectives 2004: Volume 20, Number 12
4. Martindale: The complete drug reference 34th ed. The Pharmaceutical Press

Nasal Decongestant Poisoning To A Nine-month Old Baby

Case Report

Dr. M L Tse, Senior Medical Officer, Hong Kong Poisons Information Centre

A nine-month old baby became unarousable and pale-looking shortly after he was administered a nasal decongestant at home. He was brought to the Emergency Room immediately. Physical examination revealed a drowsy baby, not responding to verbal and tactile stimuli, with some spontaneous movement of four limbs and withdrawal on pain. Pupils were 2mm in length and sluggishly reactive to light. The capillary refill was delayed. He was clinically in a shock state. His blood pressure and pulse were 80/40mmHg and 70/min respectively. Electrocardiogram showed a sinus rhythm of 70/min, which was slow for his age, whereas QRS and QTc intervals were normal. Oxygen saturation and glucosestix were normal.

This baby was given oxygen and intravenous fluid bolus. His clinical condition improved with better colour and capillary refill. He was then transferred to the paediatric intensive care unit for further care.

Further history revealed that this baby suffered from upper respiratory tract symptoms and was treated by a private doctor. Prescription included a bottle of nasal drops containing oxymetazoline. However, the baby's grandmother inadvertently put half a bottle of the nasal drops (5mls) down the baby's nostrils. Within fifteen minutes, the baby turned sick.

This baby turned out to be fine after admission. No further fluid bolus or pressor support was needed. He regained full consciousness 4 hour after admission.

DISCUSSION

Imidazoline and its derivatives are found in 142 registered pharmaceutical products in Hong Kong, mainly in the form of nose drops, nasal sprays or eye drops. Available ingredients are tetrahydrazoline, naphazoline, oxymetazoline and xylometazoline.(1) They are generally grouped as Imidazolines, a sympathomimetic drug, which share similar therapeutic and adverse effect profiles. They act on alpha-adrenergic receptors and were structurally related to clonidine. Overdosing with Imidazolines can cause central alpha-2-adrenergic stimulation. Children under 2 years of age are particularly susceptible. Typical adverse effects include initial hypertension followed by hypotension, hypothermia, respiratory depression, loss of consciousness and coma. Poisoned patients may have small pupils and may respond to naloxone but the effect is unpredictable.

The mainstay of treatment is supportive. Activated charcoal may be considered if significant amount was ingested and patient presented early.(2,3)

Imidazoline nasal decongestants are commonly prescribed by doctors and are available over the counter. However, in view of its potential toxicity, its use in children, especially those under 2 years old should be cautious. Carers should be informed of its toxic effects. Use in infants needs close supervision.

Contra-indication of Imidazolines includes narrow angle glaucoma. Prolonged use of more than 7 days is not recommended. They should be used with cautions in patients with cardiovascular diseases, hypertension, diabetes mellitus, thyroid diseases, enlarged prostate and patients on monoamine oxidase inhibitors or tricyclic antidepressants.(4)

Patients or their carers should exercise care on administration. As illustrated in this case report, the nose drops were supplied in the form of a small plastic bottle of about 5-ml size. Accurate dose delivery cannot be guaranteed by the elderly carers due to poor dexterity. Prescribers should consider their patient's ability of accurate dosing with such device before prescribing.

References

1. Registered pharmaceuticals in Hong Kong. Department of Health, The Government of HKSAR. www.psdh.gov.hk/pharmsearch Accessed on 19 Oct. 2005
2. RS Weisman, Antihistamines and decongestants. In: Goldfrank's Toxicological Emergencies, Sixth Ed. Stamford, Connecticut: Appleton & Lange; 1998. p.608-12.
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4. DRUGDEX Evaluations. MICROMEDEX Healthcare series. 1974-2005 Thomson MICROMEDEX

Toxicological Surveillance

During the period from 1 July to 30 September 2005, 613 poisoned patients sought medical assistance at the accident & emergency departments of 6 acute regional hospitals (PMH, PWH, PYNEH, QMH, TMH, & UCH) in Hong Kong. The male to female ratio was 1: 1.3. The age distribution of the patients is shown in Figure 1.

Majority (51%) of the poisonings occurred at homes while only 5% occurred at workplaces, the rest of the cases (44%) occurred in other places. Half of the cases were suicidal in nature, accidents accounted for 39% of the cases and 7% were related to recreational activities (Figure 2).

More than 60% of the cases involved western medicines (e.g. paracetamol, benzodiazepines, antidepressants, opioids etc). Insect stings and bites accounted for 16% of the cases while environmental chemicals, Chinese medicines and household products (e.g. disinfectants) accounted for 8%, 6% and 4% respectively (Figure 3).

Two death cases were reported. The first death case involved an 80-year-old woman who committed suicide by concomitant ingestion of a household disinfectant and anti-hypertensives. The other case involved a 27-year-old woman who committed suicide by burning charcoal.

Figure 1: Age Distribution of Patients

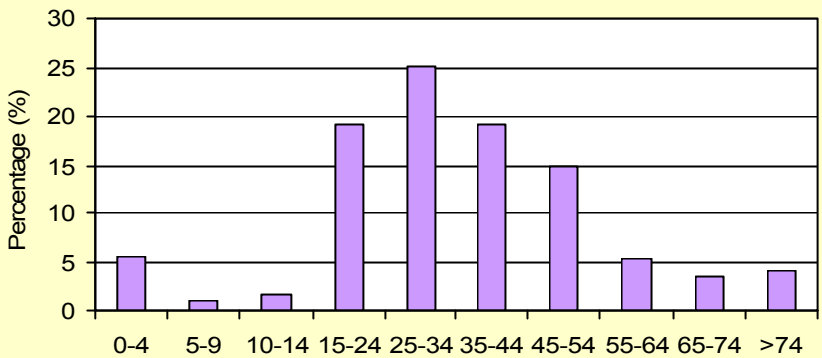


Figure 2: Nature of Poisoning

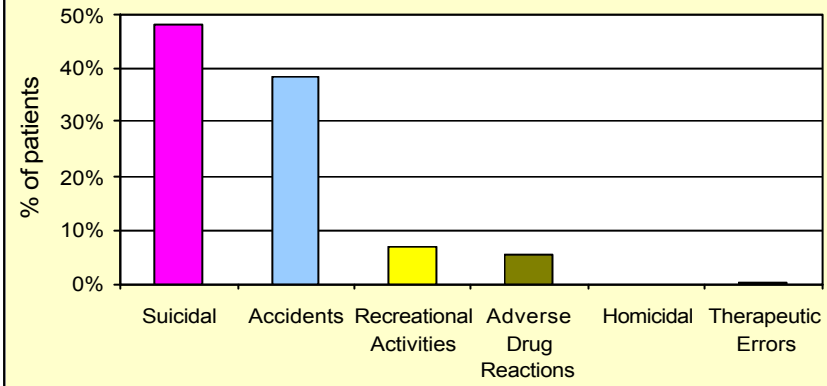
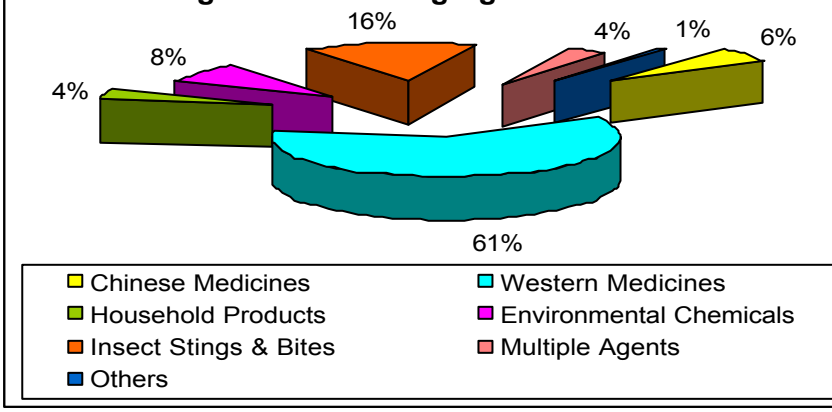


Figure 3: Poisoning Agents Involved



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