



COMMON FOOD POISONING IN HONG KONG

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Food poisoning is defined as **acute** illness with **gastrointestinal** or **neurological** manifestations affecting two or more persons who have shared a meal

during the previous 72 hours. In contrast, food borne disease means illness caused by food consumption (Table 1).

Table 1

Bacterial	Viral	Biotoxin	Chemical
<i>Vibrio parahaemolyticus</i>	Norovirus	Ciguatera fish	Clenbuterol
<i>Salmonella</i>	Rotavirus	Puffer fish	Insecticide
<i>Staph aureus</i>		Shellfish	Heavy metal
<i>Clostridium perfringens</i>		Scombroid	
<i>Shigella</i>		Mushroom	
<i>Campylobacter</i>		Botulism	
<i>Enteropathogenic E. Coli</i>			
<i>Vibrio Cholera</i>			

Onset

In general, illness caused by bacterial or viral origin tends to have longer incubation period and the causative agents can be eliminated by adequate cooking, whereas biotoxin and chemical poisoning will have shorter or no incubation period and the agents are mostly heat resistant.

Summary of Common Aetiological Agents in Hong Kong

In the year of 2002, a total of 671 food poisoning outbreaks were reported and the causative agents are listed in Table 2.

Clinical Presentation

The clinical picture consists of GI tract symptoms, with or without neuropathic or paralytic manifestation

Table 2

<i>Vibrio parahaemolyticus</i>	50%
<i>Staph aureus</i>	14%
<i>Salmonella</i>	14%
<i>Norovirus</i>	6%
<i>Clostridium perfringens</i>	3%
<i>Clenbuterol</i>	1%
<i>Ciguatera</i>	1%
<i>Pesticide</i>	0.2%

depending on cause. Cues can be deduced from the length of incubation period: **short interval means pre-formed biotoxins or chemicals** being the causative agent, whereas **longer period of incubation period is suggestive of bacterial/viral infection**. The type of ingested food can also point to the most likely agent: *Vibrio parahaemolyticus* in undercooked seafood, *Staph aureus/clostridium/salmonella* in meat, dairy product, *clenbuterol* in pig offal, *Pesticide* in vegetable, *Ciguatoxin* in coral fish and botulism in canned food.

Clinical Examples

Case 1

In July 1995 six hundred staff of a public hospital suffered from abdominal pain, vomiting and diarrhoea 8-36 hours after a meal served in canteen; and the food in question included sausage, jellyfish and baby octopus.

Discussion

What is the likely agent? For GI symptoms beyond 8 hours the most likely cause is gut infection due to *Clostridium perfringens* (presented 8-16 hours after meal with toxin production in the body), salmonella, shigella, *Vibrio parahaemolyticus*, campylobacter (presenting 12 to 36 hours with gut infection \pm tissue invasion). These patients may have fever, blood and mucus in stool if tissue invasion has taken place.

Alternatively certain mushroom poisoning (*Amanita* species) has onset of GI symptoms 6-12 hours after ingestion to be followed by liver failure.

(Answer: see bottom of page 4)

Case 2

18 firemen had oral numbness and rasping, burning sensation in the throat immediately after taking some vegetables for lunch.

Discussion

For GI symptoms occurring within 6 hours, biotoxin or chemical agents (*e.g. preformed bacterial toxin, metal ions, plant irritant and some toxic mushrooms*) should be considered.

Bacterial toxin from cooked food contaminated with organism producing heat-resistant toxin (for example *Staph aureus* in meat and dairy products, *Bacillus cereus* in fried rice) gives rise to early abdominal pain, vomiting and diarrhoea within 6 hours of consumption of the contaminated food.

In case of metal ions (*copper, zinc, tin ion formed in acidic beverage in metallic container*) GI irritation is the main symptom resulting in abdominal pain, vomiting and diarrhoea within 1 hour of ingestion.

Some irritant plants (*e.g. Alocasia odorata* "Elephant's ear, 假芋頭" and related species) contain insoluble calcium oxalate crystals, which

irritate mouth and throat, giving rise to swelling of mucous membrane with burning pain, skin rash and itchiness. This irritant plant is found mixed in Tung Choi (通菜) during typhoon seasons, because of its look-alike appearance it can be mistaken for the real thing.

Many mushrooms species contain GI irritants that cause vomiting and diarrhoea within 2 hours of consumption. These include the inedible *Clitocybe species* (漏斗菇) that are often confused with the edible species (猪肚菇).

(Answer: see bottom of page 4)

Case 3

Seven friends shared a dinner and two hours later, one person died and another developed ventilatory failure requiring intubation. The other had weakness and limb numbness requiring admission to hospital.

Discussion

In general, for food poisoning with neurological symptoms, the following comes into consideration (Table 3).

(Answer: see bottom of page 4)

Case 4

All three members of a family developed palpitation, headache, dizziness, tremor and flushing 1 hour after dinner; one of them had in addition hand numbness and chest pain.

Food poisoning with anaphylaxis-like presentation could be due to *Clenbuterol*, *Scombroid* or Chinese Restaurant Syndrome (Table 4).

(Answer: see bottom of page 4)

Management of Food Poisoning

1. Collection of evidence – High index of suspicion is required when dealing with suspected cases; detailed food history and similar symptoms in meal sharers must be looked for. Diagnosis of specific food poisoning (together with poison/agent/source) must be reported to Food and Environmental Hygiene Department (FEHD) & Department of Health (DH) immediately. Samples (residual food/vomitus/stool) should be saved for further investigation.

Table 3

<i>Ciguatera Poisoning</i>	<ul style="list-style-type: none"> * Heat stable <i>ciguatoxin</i> * <i>Dinoflagellate gambierdiscus toxicus</i> * Big coral fish (snapper, garoupa) through food chain * Sodium channel opener causing permeability disturbance * Lasts for days to months * Initial GI symptoms 1-6 hours after ingestion * Numbness of mouth * ± headache, dry mouth, metallic taste * Pruritis, muscle and joint pain * Photophobia, blurred vision, transient blindness * Characteristic shooting pains in legs & teeth * Severe cases: reversal of hot/cold sensation * Bradycardia, hypotension, cranial nerve palsy, respiratory failure
<i>Vegetable-borne Pesticide</i>	<ul style="list-style-type: none"> * Methamidophos (organophosphate) in flowering vegetable (choi sum) * Anticholinesterase: muscarinic/nicotinic/CNS effect * Nausea/vomiting/abdominal pain/diarrhoea * Headache/dizziness/lacrimation/small pupil/sweating/fasciculation/weakness * Dose ingested usually small, development of paralysis very rare * Incubation time: half to 4 hours
<i>Paralytic Shellfish Poisoning</i>	<ul style="list-style-type: none"> * Neurotoxin in <i>dinoflagellates</i> – heat stable <i>Saxitoxin</i> * Concentrated in viscera of bivalves * Sodium channel blocker in nerve & muscle * Common in summer/red tide season * Numbness of mouth/limbs/dyspnoea/dysphagia * Muscle weakness/ataxia/respiratory failure * Incubation 5 minutes to 4 hours * Duration hours to days
<i>Puffer Fish Poisoning</i>	<ul style="list-style-type: none"> * Poisoning common in Japan (eaten as fugu) * Tetrodotoxin in puffer fish (mainly in viscera) * Heat stable potent neurotoxin blocking Na Channel * Nausea/vomiting/abdominal pain * Headache/numbness/dysphagia * Weakness/co-ordination problem * Hypotension/cardiac arrhythmia/paralysis/respiratory failure * Onset: 10 minutes to 4 hours
<i>Food-borne Botulism</i>	<ul style="list-style-type: none"> * <i>Clostridium botulinum</i> grows anaerobically * Home made smoked/canned food * Producing potent heat-labile botulinum neurotoxin * Inhibits acetylcholine release causing motor weakness * Initial GI & non-specific symptoms * Motor weakness occurs 18-36 hours later * Eye & bulbar weakness * Descending flaccid paralysis, respiratory failure * Weakness lasts for weeks to months
<i>Methanol</i>	<ul style="list-style-type: none"> * Outbreaks of mass poisoning in India, Cambodia, China, Iran & Pakistan * Adulterated home-made liquor * Latency up to 30 hours * Presented with shortness of breath (metabolic acidosis), blindness, seizure, coma
<i>Tetramine</i>	<ul style="list-style-type: none"> * Rat poison popular in China * Potent GABA antagonist – status epilepticus * Usually fatal * Antidote: DMPS (<i>dimercaptopropane-1-sulphonate</i>) * Mixed with food – ideal homicidal agent * Causes 100 deaths in hundreds of poisonings

Table 4

Agent	Symptoms
<i>Clenbuterol</i>	<ul style="list-style-type: none"> * Long acting beta-agonist (half life ~ 30 hours) * Induces muscle hypertrophy & reduces fat deposition * Used by farmers as animal feed & also by body-builders * Frequent outbreak recent years from eating pig's offal, pig lung, liver and pork * Incubation 15 minutes to 8 hours * Most patients have palpitation, headache, tremor, some also have dizziness, weakness, GI symptom, flushing, numbness and weakness * Watch out for hypokalaemia and hyperglycaemia * Diagnosis: food sample or patient's urine * Treatment: β-blocker
<i>Scombroid</i>	<ul style="list-style-type: none"> * Ingestion of preformed histamine on fish skin * Enzymatic decomposition of fish by marine bacteria releases fresh histamine * Burning of mouth/flushing/headache/dizziness \pm GI symptoms \pm urticaria, bronchospasm * Incubation period 5 minutes to 1 hour and the duration lasts only few hours
<i>Chinese Restaurant Syndrome</i>	<ul style="list-style-type: none"> * Lightness and burning sensation in upper body, headache, flushing, lacrimation, weakness, nausea, thirst * Cause: excessive monosodium glutamate in foods * Onset: 5 minutes to 1 hour and lasts for hours

2. Supportive treatment (*fluid replacement for dehydration, symptomatic treatment for GI symptoms*) is the only treatment needed in most cases.

3. Specific treatment –

- Antibiotic is indicated for shigellosis, cholera and typhoid fever (ciprofloxacin). Monitoring of respiratory function (PFR in paralytic type) is essential in case ventilatory support may be required for paralytic poisoning by shellfish, ciguatera, puffer fish, botulism.
- Activated charcoal or gastric lavage may be considered if patients present for treatment early (1-2 hours after ingestion).

- Anti-toxin (botulinum antitoxin) for botulism and antihistamine for scombroid can be used.

- As for Ciguatera, mannitol 1 gm/kg in 30 minutes may be given for pain relief, but efficacy of such treatment is disputed.

Important links:

Hong Kong Poison Information Centre

Poison information hotline:

26351111 (9 am to 9 pm daily)

(24 hours service starting 1/7/07)

Email: hkpic@ha.org.hk

Answers:

Case 1

Vibrio parahaemolyticus in jellyfish and baby octopus

Case 2

Irritant plant is found mixed in Tung Choi

Case 3

Puffer Fish Poisoning

Case 4

Clenbuterol in pork