Case conference

Presenter : Int 張婺婷
Supervisor: F 鄭伯良
Date : 2010-8-31

Discussion

Common herbicide and pesticide intoxication


—Glyphosate(年年春)
—Paraquat(巴拉刈)
—Organophosphate (巴拉松)
—Carbamate(好年冬)

Glyphosate

- **a non-cholinergic**
  - 41% - isopropylamine salted glyphosate
  - **15% - anionic surfactant(polyoxyethyleneamine)**
  - **pH = 4.8**
- Mechanism : unclear, may related to its **anionic surfactant** and **acidity corrosiveness**

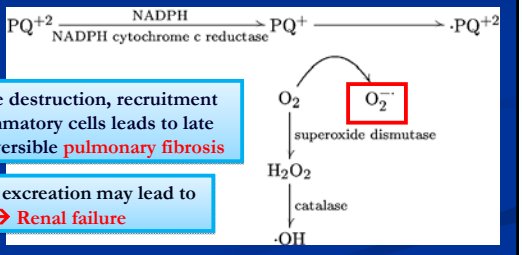
- **Initial presentation : minutes after ingestion**
  oral burning sensation , laryngeal pain, oral ulcer, N/V , abdominal pain, diarrhea→ **respiratory tract injury, hypotention,** dyspnea, cyanosis

⟷ **paraquat ingestion : S/S usually occurr after 1 day**

- Management
  - Oxygen, **hydration, electrolyte supplement**
  - Decrease absorption :
    - poor absorbability to activated charcoal, gastric lavage is not recommended
    - Avoid laxatives
  - No antidote
  - Increase excretion : hemodialysis may use in patient with poor renal function

Paraquat– higher mortality

- Mechanism :



oxidative destruction, recruitment of inflammatory cells leads to late and irreversible pulmonary fibrosis

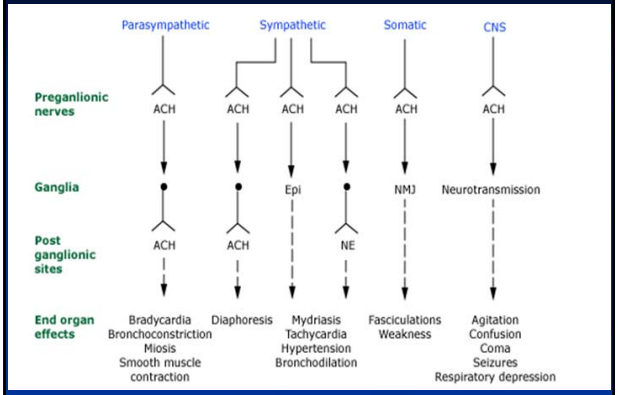
Renal excreation may lead to ATN→ Renal failure

- Direct local toxicity and systemic toxicity
  - GI : burning sensation → N/V, diarrhea → ulcer
  - skin : rash, cracked nails
  - lung : hemoptysis →lung edema → ARDS→ irreversible fibrosis
  - eye : corneal ulcer → fibrosis
  - Renal failure, metabolic acidosis
- Lab evaluation : urine **sodium dithionite test**

- Initial management
  - ABC, **avoid oxygen (oxygen facilitates lung fibrosis)**
  - Remove clothes , wash skin & eyes
  - Decrease absorption : GI removal by gastric lavage with Fuller's earth/Bentonite/activated charcoal、 **laxatives**
  - **No antidote**
  - Increase excretion :
    - Forced diuresis is in effective
    - Blood removal by hemoperfusion、continuous AV hemofiltration in youner patient or ingestion less than 3~4 hrs

Organophosphate and carbamate

- garlic-like odor
- **cholinesterase inhibitors→cholinergic toxicity** following cutaneous exposure, inhalation, or ingestion
- **Carbamate is a transient cholinesterase inhibitor, toxicity is less severe, recovery is faster, avoid PAM use**
- Lab : RBC cholinesterase , plasma cholinesterase (not correlate with severity)



Vital Signs				Mental Status	Pupil	Bowel Activity	Skin
BP	P	R	T				
±	±	–/↑	–	Normal to depressed	±	↑	Wet

- **Muscarinic (DUMBLES)**
  - **D**iarrhea
  - **U**rination
  - **M**iosis
  - **B**radycardia,**B**ronchorrhea, **B**ronchospasm
  - **E**mesis
  - **L**acrimation
  - **S**alivation, **S**ecretion, **S**weating
- **Nicotinic (MTWThF)**
  - **M**ydriasis
  - **T**achycardia
  - **W**eakness
  - **TH**ypertension,Hyperglycemia
  - **F**asciculations

- Management
  - Oxygen , avoid succinylcholine in RSI, fluid resuscitation
  - Remove clothes, seal the bottles
- **Atropine challenge** if diagnosis is in doubt
  - 1 mg IV , absence of anticholinergic signs (tachycardia, mydriasis) suggests organophosphate or carbamate poisoning

Atropine : anti-muscarinic

- Therapeutic goals : keeping HR 80～120/min until bilateral BS clear
- **adjust the dosage by the amount of bronchial secretion (*not by heart rate or pupil size*)**
- atropine IV q2h prn**(bolus)**易使HR>150而容易VT, Vf
- atropine 5mg in N/S 500 cc IVD run 5-10 cc/min **(continuous dripping)**較易控制心跳，及呼吸道分泌物。

- atropine 0.5mg q1h～q6h **inhalation**則使用於心跳很快，但呼吸道分泌物仍很多時

Pralidoxime :
anti-muscarinic and anti- nicotinic

- atropine does not bind to nicotinic receptors, it is ineffective in treating neuromuscular dysfunction
- PAM is a cholinesterase reactivating agents
- should not be administered without concurrent atropine, to prevent worsening symptoms due to transient oxime-induced acetylcholinesterase inhibition

- Initial bolus : 2 g IV over 30 minutes based on severity of symptoms
- Slow administration prevents the muscle weakness that results from the transient inhibition of acetylcholinesterase
- Then, continuous infusion at 8 mg/kg/hour in adults
- **Avoid PAM in carbamate poisoning**
  - PAM did not combine to carbamate
  - PAM has been reported to potentiate the toxic effects of carbamate