Toxicologic Emergencies

Outcomes for Unit 2 - Toxicology

At the completion of this lecture, the learner will be able to:

- Describe the incidence, morbidity and mortality of toxic emergencies (5-8.1)
- Identify risk factors predisposing to toxic emergencies (5-8.2)
- Discuss the pathophysiology of the entry of toxic substances (5-8.7)
- Discuss the assessment findings associated with various toxidromes (5-8.8)

Outcomes, cont.

- Correlate abnormal findings with clinical significance in patients with the most common poisonings (5-8.23)
- Identify the need for rapid intervention of a patient with a toxic emergency (5-8.9)
- Discuss the management, in general, of toxicologic emergencies (5-8.10)
- Integrate the pathophysiology with the signs and symptoms of the most common poisonings by overdose (5- 8.18)
- Discuss the contraindications and disadvantages of inducing vomiting (5-8.17)

Epidemiology

- Annually 1.8 million reported poison exposures. Roughly 764 reported fatalities.
- Children < **6** years of age - involved in **60** % of reported exposures, but only **6** % of reported fatalities.
- The most common pharmaceutical ingestion leading to death in this age group was ***iron***.
- Suicide attempts accounted for only slightly more than **6** % (7.2%) of reported exposures
- but were responsible for almost **60** % (53.4%) (408/764) of all ***fatalities***
- Overall, the greatest overall number of poisoning deaths are due to cyclic ***antidepressants*** (CAs) and analgesics
- The most common pharmaceutical prescription leading to death in adults was ***TCA*****s**

Epidemiology

Agent ingested by child	Deaths
Iron	~ 32 %
Hydrocarbons	~ 24 %
Pesticides	~ 24 %
Antidepressants	~ 20 %
Alcohols	~ 14 %
Salicylates	~ 12 %

Epidemiology

Agent ingested by adult	Deaths
• Analgesics (often as coingestion)	~ 26 %
• Antidepressants	~ 26 %
• Sedative/| Hypnotics	~ 13 %
• Stimulants and street drugs	~ 12 %
• CV drugs	~ 12 %
• Alcohols	~ 10 %

Management Approach

- A/C
- B
- C
- D
- E

Toxicology Management

Approach to the Management of the Poisoned (or Possibly Poisoned) Patient

Primary Survey - as for all emergency conditions, immediate life-threats must be sought and treated as they are discovered.

A Airway (maintain C-spine control if anv possibility of neck injury).
Suction secretions.
No gag = ET

B Breathing
assess adequacy and assist if necessary
RR : 12, unless otherwise indicated *
* known acidosis

Toxicology Management

Initial Approach to Management

C Circulation
- check pulse and
- skin: color, T^0

D Disability
- assess neurologic status using AVPU.
- check and document pupillary size and reactivity

E Expose.

Toxicology Management

Approach to Management- Resuscitation Phase

Accomplished simultaneously with the primary survey.

Initiate *B* 0_2 : 100 % NRB

Initiate *C* M_3 : ECG monitor, pulse oximetry monitor, BP monitor .

B : blood draw

IV : if any question of need for BP support:
2 IV , large bore , NS
treat hypotension aggressively with fluids (and usually not vasopressors)

G : glucose check

Toxicology Management

Resuscitation Phase (cont.)

D

$D_{50}W$, naloxone, (thiamine if indicated) - for **any** depressed level of consciousness.

D etective work: before leaving the scene, collect pill bottles,...

E

Elimination Phase

Toxicology Management

Elimination Phase

- *E* limination
  - activated charcoal 1 **gram** / kg
  - Ipecac - only if ordered and no contraindications are present
  - disrobe and wash if indicated
  - NG lavage and suction (only after airway is secured)
  - antidotes - to follow
- Initiate emergency antidote if indicated for suspected specific life-threatening toxins:
  - cyanide kit (see text: p.586, bottom of table 110-4).
  - additional antidotes - see text (pp. 514-515), and handouts to follow

Airway

- Check for gag reflex
- Assess the need for intubation
- Initially and serially
- R/O causes of airway compromise include:

Airway

Causes of airway compromise include:

- Posterior displacement of the tongue
  [e.g. CNS and respiratory depressants]
- Oropharyngeal mucosal injury or edema
  [e.g., from caustic ingestions]
- Angiodema
  [e.g., angiotensin- converting enzyme (ACE) inhibitors]
- Trauma

Breathing

- Assess adequacy of oxygenation and +/ - ventilation with pulse oximetry (and arterial blood gas (ABG) determinations)
- Breathing may be compromised by the following:
  - Hypoventilation
    - (CNS or respiratory depressants, peripheral muscle toxins)
  - Aspiration
    - (CNS or respiratory depressants, peripheral muscle toxins)
  - Pulmonary edema
    - (inhalation injuries, heroin, salicylates)

Circulation

Assess

- rate
- rhythm
- adequacy of perfusion
- BP

Circulation may be compromised :

- by multitude of medications and toxins
- by interfering with:
  - Pipes
    - ↓ PVR (smooth muscle paralysis)
  - Pump
    - Arrhythmia
    - Negative inotrope (pump muscle paralysis)

Patient History

Patient may not be cooperative,
or may be unable to give accurate history of ingestion or exposure.

Other sources of information include :
family members, friends, coworkers,
rescue personnel,
patient's physician or pharmacist

Questions to ask include the following:

- What ?
- How much ?
- When ?

What ?

- What drugs is the patient ***taking***?
- What drugs or chemicals are ***available*** to the patient?
- What chemicals or toxins is the patient exposed to at work?
- What was present at the ***scene***?
  - (e.g. pill bottles, chemical containers, drug paraphernalia)
- What events have occurred ***since*** the ingestion or exposure?

How much ?

- How much of the drug was initially ***available***?
- How much of the drug is ***remaining*** in the bottle or container?

When ?

- When was the patient ***last observed*** to be at his or her baseline?
- ***Onset*** / When did the patient ingest or become exposed to the drug, chemical or toxin?

Is History Suggestive of the of Dx. and Treatment

- Rarely the History is suggestive of the diagnosis / toxin
- Toxidrome
  - when a typical pattern of symptoms of a toxicologic syndrome may aid in the diagnosis

PE is often Suggestive of Dx. and Treatment

- VS
- Neuro
- Toxidrome
  - Physical signs of a toxicologic syndrome that may aid in the diagnosis