Treatment of Acute Amphetamine Toxicity

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Structure-Activity Relationships

Amphetamine
(Alpha-Methyl Phenylethylamine)
Structure-Activity Relationships

Amphetamine

Methamphetamine
Structure-Activity Relationships

Amphetamine

3,4-Methylenedioxymethamphetamine
It Doesn’t Matter What the Drug is or Reported To Be
The Treatment is the Same
Neurotransmitters/Receptors

- **Dopamine & Histamine**
  - Cognition (Mental Alertness)
    - Work Memory: Compulsion*
    - Clarity: Sedation^
    - Motivation: Apathy~
  - Appetite
  - Intuition

- **Norepinephrine & Acetylcholine**
  - Vigilance (Sustained Concentration)
    - Transition: Obsession*
    - Recall Memory: Doubt^
    - Perseverance: Hesitation~
  - MOOD
  - Deficits
    - *Distraction
    - ^Impairment
    - ~Fatigue

- **Serotonin & Glutamate**
  - Perception (Sensory Satisfaction)
    - Learning Memory: Paranoia*
    - Pleasure & Pain: Insensibility^
    - Relaxation: Anxiety~
Why are they so Good?

- Euphoria
- Stimulant + hallucinogenic
- Elevated mood
- Appreciation of music
- Increased sexual function.
- Improved mental function.
- Empathogen
- Entactogen
Why are they so Bad?

- Tachycardia
- Hypertension
- Agitation
- Seizures
- Anxiety

- Arrhythmias
- Paranoia / hallucinations
- Bruxism
- Movement disorders
- Hyperthermia
General Management
Agitation +/- Paranoia, Hallucinations
Benzodiazepines
Hyperthermia (Temp > 39-40°C)
Benzodiazepines
Hypertension
Benzodiazepines
Tachycardia
Benzodiazepines
Seizures
Benzodiazepines
Vascular Complications
Suspect a vascular catastrophe if a significant headache or chest pain
Dopamine Antagonists
Excited Delirium

‘Crazy then Dead’
Triad:

Delirium
Psychomotor agitation
Physiological excitation
Urgent Chemical Take-Down

If someone had treated my excited delirium with droperidol, I wouldn't be here.
Case 1

21M
Taking ‘LSD’ at a party.

Agitated, hallucinating, tachycardic
Punched his grandmother in the face when got home
Benzodiazepines +/- Dopamine Antagonist
Case 2

21M
Took ‘ice’ at a party.

Bizarre behaviour
HR 180 STc
T-40
Sweating profusely
Benzodiazepines +/- Chemical Takedown
Aggressive rapid cooling
+/- Muscle Paralysis
Case 3

21M
Took ‘legal ecstasy’ at a party.

Presents with a seizure.
Benzodiazepines
General Management - Summary

- ABC
- **Benzodiazepines** first line for agitation, paranoia, hyperthermia, hypertension, tachycardia, seizures
- May need Dopamine blocker
- Aggressive cooling
- Check electrolytes early
- CT brain in all cases where there is not rapid full neurological recovery after seizure
- Beware the severe headache or chest pain
Conclusions

• Similar structures lead to common clinical effects
• The nuances of each individual amphetamine – like drug is not important in the acute setting – treat recognizable adverse effects the SAME in all
• Benzodiazepines are mainstay

Questions?