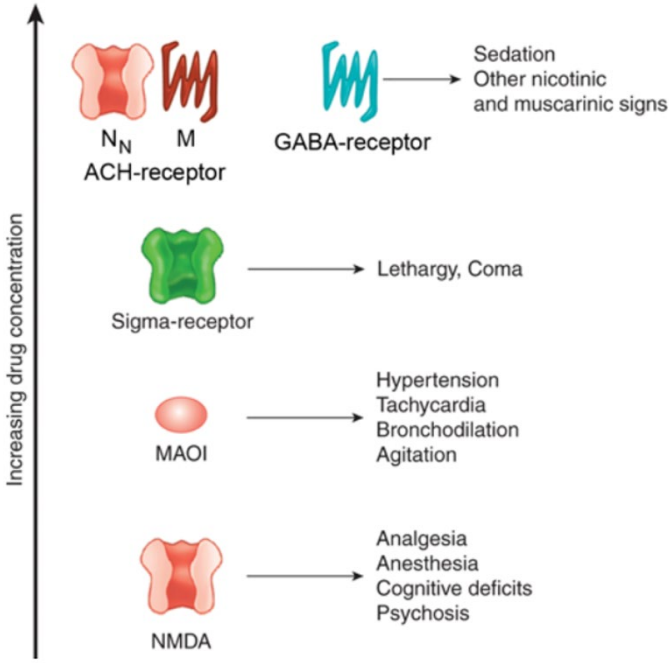
Clinical Pharmacology & Toxicology Pearl of the Week

~ Phencyclidine (PCP) ~

What is PCP?

- ✓ A dissociative anesthetic abused for its psychoactive effects, reaching peak popularity in the 1970's
- ✓ Structurally similar to ketamine, with ketamine having one-tenth the potency as PCP with a shorter duration of action
- ✓ Non-competitive NMDA antagonist
- ✓ At escalating doses, stimulates biogenic amine reuptake complexes to block the re-uptake of dopamine and norepinephrine
- ✓ Can also bind sigma, acetylcholine and GABA receptors at high concentrations
- ✓ Street names: "angel dust", "peace pill", "sawgrass" and "rocket fuel"
- ✓ PCP analogs have been found in recent drug seizures in Alberta.



From Goldfrank's Toxicologic Emergencies, 11th ed.

Clinical Presentation

- ✓ Onset of action is most rapid from the IV and inhalational routes (2-5 minutes), and slowest following gastrointestinal absorption (30-60 minutes)
- ✓ Signs and symptoms of toxicity usually last 4-6 hours, with large overdoses generally resolving within 24-48 hours
- ✓ Wide range of symptoms due to PCP's dissociative, sympathomimetic, muscarinic and nicotinic properties:
    - Neurological → agitation, confusion, hallucinations, delusions, violent behaviours, seizures, ataxia, muscle rigidity, coma
    - Cardiovascular → hypertension (60%), tachycardia (30%), hyperthermia (2.6-4%) or hypothermia (6.4%) depending on degree of agitation and environmental conditions
    - HEENT → nystagmus (60-90%), miosis
    - Psych → feelings of strength, invulnerability, and violence
- ✓ Morbidity and mortality is related to associated trauma, rhabdomyolysis, seizures, and hypertensive crises

Investigations

- ✓ Usually a clinical diagnosis
- ✓ Evaluate for other dangerous effects of PCP: occult trauma, rhabdomyolysis , hypoglycemia, hepatic injury due to hyperthermia, end-organ damage due to hypertensive emergency
- ✓ Urine drug screen:
    - Can detect PCP for 2-4 days after use, and can be positive for > 1 week
    - False positives can result from Dextromethorphan, Chlorpromazine, Methadone, Ketamine, Diphenhydramine, Venlafaxine, Tramadol

Management

- ✓ Gastrointestinal decontamination is generally unnecessary, but activated charcoal may be beneficial with massive ingestions or for dangerous co-ingestions
- ✓ Environmental sensory deprivation by placing the patient in a in a quiet room with dimmed lights may be beneficial
- ✓ Chemical sedation as needed with benzodiazepines for agitation and violence
- ✓ Benzodiazepines are also the first-line treatment for PCP-induced hypertension, seizures, and hyperthermia secondary to psychomotor agitation in addition to cooling
- ✓ Hypertension persisting after benzodiazepines with signs of end-organ damage can further be treated with phentolamine or nitroprusside
- ✓ Treat rhabdomyolysis with adequate hydration with IV fluids

The Calgary Clinical Pharmacology physician consultation service is available Mon-Fri, 8am-5pm. The on-call physician is listed in ROCA. Click HERE for more details.

The Poison and Drug Information Service (PADIS) is available 24/7 for questions related to poisonings. Please call 1-800-332-1414, and select option 1.

References

1. Nelson L, Lewin N, Howland M, Hoffman R, Goldfrank L, Flomenbaum N. Goldfrank's Toxicologic Emergencies. 11th ed. New York: McGraw Hill Medical; 2019
2. Bey T, Patel A. Phencyclidine intoxication and adverse effects: a clinical and pharmacological review of an illicit drug. Cal J Emerg Med. 2007 Feb;8(1):9-14.
3. Journey J, Bentley T. Phencyclidine Toxicity. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan. Available from: https://www.ncbi.nlm.nih.gov/books/NBK507865/
4. Heard K, Hoppe J. Phencyclidine (PCP) intoxication in adults. In: UpToDate, Post TW (Ed), UpToDate, Waltham, MA, 2021.