Update on Treatment for Methamphetamine Use Disorder

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(for 12 more days)

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Goals and Objectives

01

Briefly review methamphetamine as an illicit substance, its mechanism of action, and intoxication symptoms

02

Discuss evidence for pharmacotherapeutic treatments

03

Discuss evidence for psychotherapeutic treatments

Overview of Methamphetamine

What is Methamphetamine?

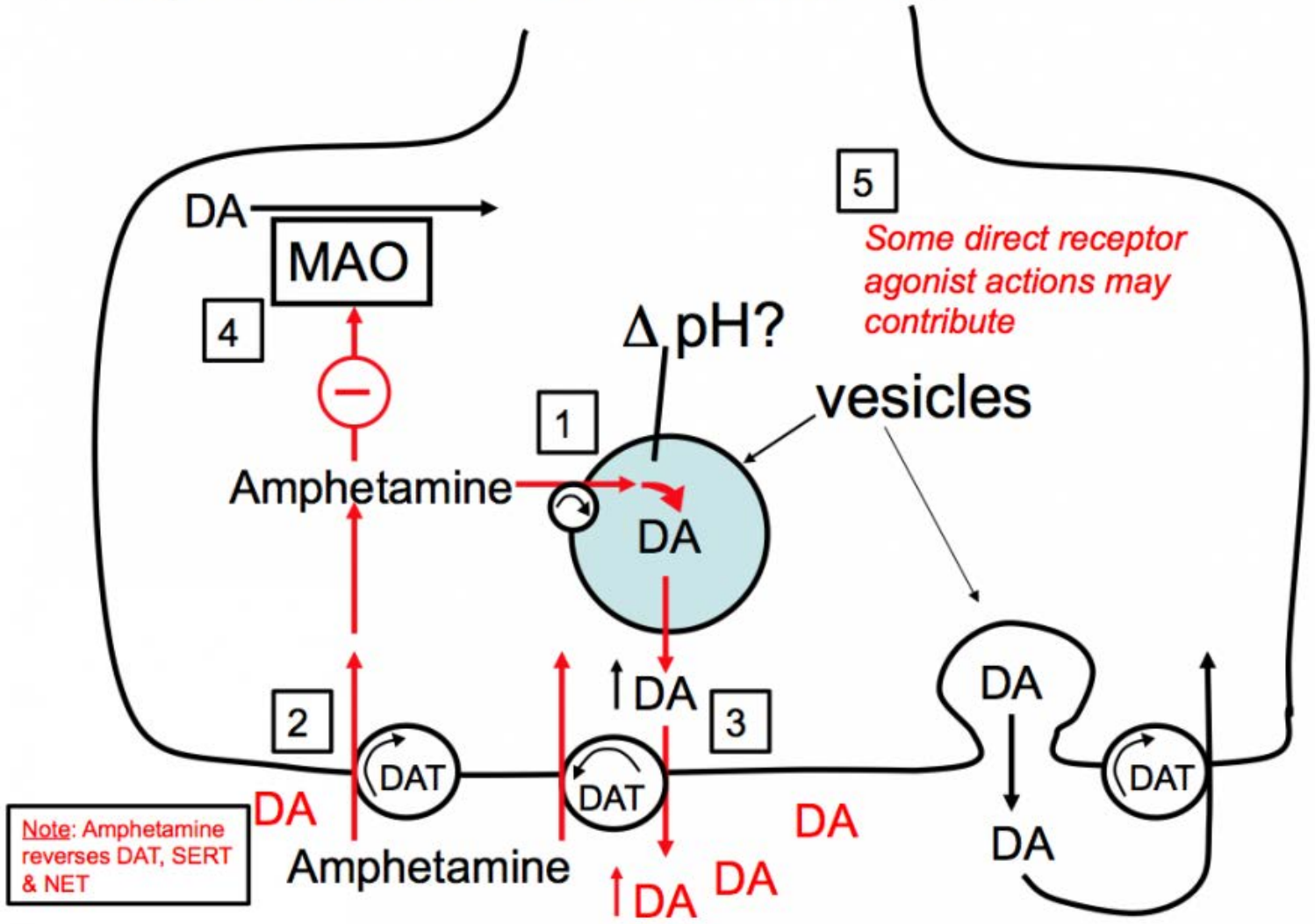
- Typically illicit stimulant
  - Prescription: Desoxyn
  - Treats: ADHD, obesity
- Increases dopamine in the brain
- Methods of Use
  - Snorting
  - Smoking
  - IV
  - Eating

Regular Meth	Powdered form, 50% purity
	Snorted
	Mixed with liquid to inject
	Can be reconstituted to make crystal meth
Crystal or Ice	Highest purity, 94-96%
	Melts when heated
	Smoked
	Injected


HEISENBERG


Breaking
Bad

Amphetamine Mechanism



http://tmedweb.tulane.edu/pharmwiki/doku.php/psychostimulants

Dopamine Release

- Food: 100 units
- Socializing: 100 units

- Alcohol: 100-200 units
- Cocaine: 300 units
- Methamphetamine: 1272 units

Effects of Intoxication

- Euphoria
- Increased energy and alertness
- Decreased need for sleep
- Decreased appetite
- Increased HR and blood pressure
- Pupillary dilation
- Hyperthermia
- Psychomotor excitation
- Analgesia
- Hallucinations
  - Auditory
  - Visual
  - Tactile
- Paranoia
  - “Tweak Peak”
- Agitation
- Violence

Drivers of Meth Use

- Meth is difficult to quit because of positive effects
  - Increases energy
  - Increases concentration
  - Appetite suppressant
- Patients might not want to quit

Pharmacotherapy Treatments

FDA-Approved Medications

- No FDA-approved medications for treatment of methamphetamine use disorder
- Studied medications have limited use

Buproprion + Naltrexone

- Double-blind, randomized control trial in NEJM
  - Moderate or severe SUD, outpatient setting
  - Non-opioid user
  - Did not specify route of administration
- Buproprion 450 mg (Wellbutrin XL) + naltrexone IM (Vivitrol)
- 11% response
  - 3 out of 4 UDS being negative
- No significant difference in depression

Topiramate

- Modest reduction in cocaine cravings
- No significant differences in negative UDS compared to placebo
- No difference in craving, depression, or anxiety
- Treatment arm reduced amount of methamphetamine use in 1 study

Psychostimulants

- Dexamphetamine
  - No difference in negative UDS, severity of use, or treatment retention compared to placebo
  - Reduced severity of withdrawal
- Methylphenidate
  - No difference in abstinence or retention rate compared to placebo
  - Increased retention rate

Mirtazapine

- One study, n=60 reduced use, no change in depressive symptoms
- Another study, n=30 showed no reduction in use, did not improve treatment retention, withdrawal, anxiety, depression

Other Medications Examined

- Bupropion
- Sertraline
  - Inferior to placebo
- Atomoxetine
- Imipramine
- Aripiprazole
  - Inferior to placebo in 1 study
- Topiramate
- Dexamphetamine
- Modafanil
- Gabapentin
- Buprenorphine
- Methadone
- Varenicline
- NAC
- Ondansetron
- Riluzole
- Flumazenil

- None of these medications showed significant effects on methamphetamine use, negative UDS, depression, anxiety, or cravings
- In some cases, doing nothing was better than doing something

Psychotherapy Treatments

Psychotherapy Treatments

- Mainstay treatment of methamphetamine use disorder
- Primary Outcomes: reduction in meth use/negative UDS
- Secondary Outcomes:
  - Treatment retention
  - Reduction in depression or anxiety
  - Reduction in high-risk behaviors
    - MSM population

Contingency Management

- Best evidence for treatment of stimulant use disorder
- Patient receives monetary reward for engagement in treatment and negative UDS
  - Draw for a CHANCE to win
- Very cost effective
- VA and academic centers
- Limitations: effects end when program ends

Contingency Management, cont.

- Improved treatment retention
- Participants in CM arm were 1.5-7.5x more likely to submit a negative UDS
- Some studies have found reductions in high-risk sexual behavior

Matrix Model

- Group therapy course
  - 16 weeks
- Mix of 12-step, CBT, and contingency management
- IOP or PHP
- Designed specifically for stimulant use disorder
  - Can be used for other substances

Matrix Model, cont.

- Reduction in meth use
- Increased abstinence days compared to TAU and control
- Reduction in risky behaviors
- Improved craving management

Other Effective Therapies

- Cognitive Behavioral Therapy
- Motivational Interviewing/MET
- Self-help groups, i.e. Narcotics Anonymous
- Case management

Take Home Message

- Methamphetamine use disorder is very difficult to treat
- Effective treatments are woefully lacking
- Main treatment of methamphetamine use disorder should be focused on therapy
  - Contingency Management
- Buproprion 450 mg + Naltrexone IM is currently our best medication option
  - Response rate was only 11%

Resources

- AshaRani, P. V., Hombali, A., Seow, E., Ong, W. J., Tan, J. H., & Subramaniam, M. (2020). Non-pharmacological interventions for methamphetamine use disorder: a systematic review. *Drug and Alcohol Dependence*, *212*, 108060. https://doi.org/10.1016/j.drugalcdep.2020.108060
- Elkins, A. C. (2020, March 3). *Is Pure Meth Blue?* Drug Rehab. https://www.drugrehab.com/blog/2018/04/11/blue-meth-purity/.
- *Psychostimulants*. psychostimulants [TUSOM | Pharmwiki]. (n.d.). http://tmedweb.tulane.edu/pharmwiki/doku.php/psychostimulants.
- Siefried, K. J., Acheson, L. S., Lintzeris, N., & Ezard, N. (2020). Pharmacological Treatment of Methamphetamine/Amphetamine Dependence: A Systematic Review. *CNS Drugs*, *34*(4), 337–365. https://doi.org/10.1007/s40263-020-00711-x
- *What Does Meth Look Like?* Drug Rehab. (n.d.). https://www.drugrehab.com/addiction/drugs/crystal-meth/what-meth-looks-like/.

Questions?

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Harm Reduction March 2021 – June 2021		
Date	**Topic**	**Presenter**
7.2.21	Microdosing	Melissa Weiner, MPH
7.18.21	Disparities in Treatment of OUDs within the LGBTQ Community	Alex KeuroghlianMD, MPH
8.6.21	COPE: Integrated Mental Health & SUD Treatment	Brian Lazano, PhD
8.20.21	Impaired Professionals	Rebecca Payne, MD

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