Stimulant Intoxication

Debby Darmansjah – Psychiatry Registrar (GVAMHS & GVADS)
JAMH ECHO 25/2/21

Objectives

- Definition
- Epidemiology
- Mechanisms of action
- Assessment
- Clinical features of stimulant intoxication
- Presentations of stimulant toxicity
- Investigations
- Management of medical complications
- Management of acute behavioural disturbance
- References

DSM-5 Criteria Stimulant Intoxication

A. Recent use of an amphetamine-type substance (ATS), cocaine or other stimulant

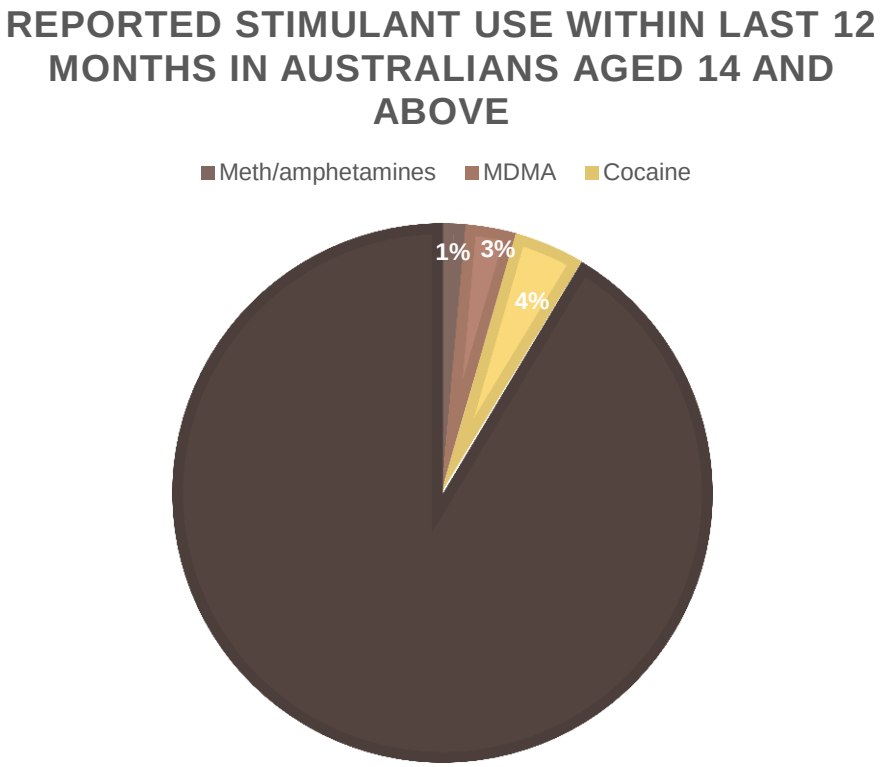
B. Clinically significant problematic behavioural or psychological changes (e.g. euphoria or affective blunting; changes in sociability; hypervigilance; interpersonal sensitivity; anxiety, tension, or anger; sterotyped behaviours; impaired judgement) that developed during, or shortly after, use of a stimulant

C. Two (or more) of the following signs or symptoms, developed during, or shortly after, stimulant use:
   - Tachycardia or bradycardia
   - Pupillary dilation
   - Elevated or lowered blood pressure
   - Perspiration or chills
   - Nausea or vomiting
   - Evidence of weight loss
   - Psychomotor agitation or retardation
   - Muscular weakness, respiratory depression, chest pain or cardiac arrhythmias
   - Confusion, seizures, dyskinesias, dystonias, or coma

D. The signs or symptoms are not attributable to another medical condition and are not better explained by another mental disorder, including intoxication with another substance.

Epidemiology

- National Wastewater Drug Monitoring Program 2019 – Australia has the fourth highest average total stimulant consumption amongst 29 countries
- Stimulant-induced mortality rate 2018 – 1.7/100,000 (4x higher than 20 years ago)
  - Most commonly due to accidental drug toxicity



AIHW, 2019

Mechanisms of action

- All stimulants cause central nervous system arousal, excitation and have sympathomimetic effects similar to noradrenaline. After the acute phase, there is typically a phase of dysphoria ('crash') which is of variable severity.
- Increase in dopamine contributes to central stimulant and rewarding effects, and serotonin to the mood effects.

Time course of pharmacological action of stimulants		
Stimulant	**Onset of action**	**Duration of effect**
Amphetamines	Within minutes (IV); ~20 minutes (PO)	8-36 hours
Methamphetamine	Within minutes (IV); ~20 minutes (PO)	8-36 hours
MDMA (ecstasy)	30-60 minutes (PO)	8-9 hours
Cocaine	½-2 minutes (IV) 5-10 seconds (smoking) 1-3 minutes (intranasal)	Up to 90 minutes Up to 20 minutes Up to 90 minutes

Assessment of acute intoxication/overdose

- What does the patient say?
- What information do the ambulance crew and paramedics have?
- What is the drug? How much has been taken?
- When was it taken? How long has it been?
- What does the Poisons Information Centre advise?
- Where are the family or friends? What do they know?
- Why has this happened? Has this happened in the past?
- What else do we know of the patient?
- What is the expected clinical course?

Clinical features of meth/amphetamine intoxication

General	Sympathomimetic effects	CNS stimulation	Psychiatric complications
-Nausea, vomiting -Jaw clenching/grinding -Stereotypic movements/formication -Hyperthermia	-Tachypnoea -Sweating -Dilated pupils, blurred vision -Tachycardia -Hypertension -Cardiac arrhythmias -Cardiovascular collapse	-Restlessness, hyperactivity -Agitation -Anxiety, panic attacks -Insomnia, sleep disorders -Twitching -Seizures -Cerebral haemorrhage, stroke	-ATS-induced psychosis -Depression during the ‘crash’ phase; suicidality

Clinical features of MDMA intoxication

General	**Sympathomimetic effects**	**CNS**	**Musculoskeletal**
-Fatigue -Nausea -Dry mouth -Restlessness -Insomnia -Jaw clenching -Hyperthermia	-Hypertension -Tachyarrhythmias -Asystole -Arteritis, vasculitis -Cardiovascular collapse	-Restlessness in the legs -Transient gait disturbance -Increased tactile sensitivity -Impaired memory and learning -Cerebral haemorrhage or oedema	-Muscle cramps -Rhabdomyolysis -Dehydration (sweating) -Water intoxication and hyponatraemia
Gastrointestinal	**Renal**	**Neuropsychiatric**	
-Hepatotoxicity	-Acute kidney injury	-Agitation -Hallucinations	

Clinical features of cocaine intoxication

General	Sympathomimetic effects	CNS	Neuropsychiatric symptoms
-Fatigue -Nausea -Dry mouth -Restlessness -Insomnia -Jaw clenching -Hyperthermia	-Tachycardia -Hypertension -Tachyarrhythmias -Myocardial infarction -Peripheral ischaemia, gangrene	-Tics and other stereotyped muscle activity -Seizures -Intracranial haemorrhage -Ischaemic stroke -Cerebral vasculitis	-Paranoia, psychosis -Violent and erratic behaviour -Hypomania, mania -Depersonalisation -Confusion -Delirium
Respiratory	**Gastrointestinal**	**Musculoskeletal**	**Renal**
-Dyspnoea, tachypnoea -Haemoptysis	-Abdominal pain, bloody stools, bowel ischaemia & infarction -Hepatic ischaemia & necrosis	-Muscle cramps -Rhabdomyolysis	-Acute kidney injury

Presentations of toxicity

- Acute behavioural disturbance
- Medical complications
  - Hyperthermia
  - Serotonin syndrome
  - Electrolyte disturbances (hyponatraemia, hypokalaemia), hypoglycaemia
  - Rhabdomyolysis, renal failure
  - Acute cardiac events
  - Acute cerebrovascular events
  - Delirium, seizures, coma, death

Investigations

- Physical observations and examination
- BSL
- Urine Full Ward Test and drug screen
- FBE, UEC, LFT, CK (+ Trop if chest pain)
- ECG (if chest pain, SOB, desaturation, hypertension, tachycardia)
- CTB (if altered conscious state, focal neurological signs, severe headache)

Management of medical complications

DRABC

- Remain with patient
- Minimise stimulation in surrounding area
- Explain what is happening to patient and what they can expect

Requires urgent medical care if:

- BP ≥ 180/120 mmHg
- Chest pain, shortness of breath
- Severe headache
- Seizure
- Sudden neurological changes
- Serotonin syndrome/toxicity

SVHM, 2014

Management of acute behavioural disturbance

- Create opportunity and environment for patient to express fears, frustration, anger etc.
- Explore with the patient what interventions/solutions would assist them to gain control.
- Assess “time out” opportunity for patient to regain control.
- If clinical situation warrants, patient may require restraint.
- If required to place client in a safe environment, seclusion might be considered. Explanation to be given to patient and staff. The patient should be afforded the opportunity to debrief about the episode, at a reasonable interval.

Management of acute behavioural disturbance

STEP 1

- Diazepam, PO, 5-20mg Q2-6h OR
- Olanzapine, PO, 5-10mg Q2-6h

STEP 2

- Diazepam, PO, 5-20mg Q2-6h AND
- Olanzapine, PO, 10-20mg Q2-6h

STEP 3

- Olanzapine, IM, 10mg Q2h OR
- Droperidol, IM, 2.5-10mg Q20m OR
- (Zuclopenthixol Acetate, IM, 100mg)
- Clonazepam, IM, 1-2mg Q2-4h OR
- Midazolam, IM, 0.1mg/kg

SVHM, 2014

References

1. Australian Institute of Health and Welfare. (2020). Alcohol, tobacco & other drugs in Australia. Accessed from: https://www.aihw.gov.au/reports/alcohol/alcohol-tobacco-other-drugs-australia/contents/drug-types/meth/amphetamine-and-other-stimulants
2. American Psychiatric Association. (2013). Diagnostic and Statistical Manual of Mental Disorders (5th ed.). Arlington, VA: American Psychiatric Association.
3. Saunders, J. B., Conigrave, K. M., Latt, N. C., Nutt, D. J., Marshall, E. J., Ling, W., Higuchi, S. (2016). Oxford Specialist Handbooks Addiction Medicine (2nd ed.). New York, NY: Oxford University Press.
4. St. Vincent's Hospital Melbourne. (2014). Guidelines for the acute assessment and management of amphetamine-type stimulant intoxication and toxicity. Accessed from: https://www.svhm.org.au/ArticleDocuments/2140/ATSIntoxicationWithdrawalflowchartNov2014.pdf.aspx?embed=y