Physical and psychological effects of methamphetamine use

Amanda Baker PhD
NCETA’s NATIONAL METHAMPHETMINE SYMPOSIUM

Making Research Work in Practice

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Amanda Baker PhD

Amanda.Baker@newcastle.edu.au
Why examine physical and psychological effects?

- Effective public health responses

(Marshall & Werb 2010)
Immediate psychological effects
(Majumder & White 2012)

- Euphoric state
- Increase in energy levels
- Enhancement of mood
- Increased self-esteem
- Alleviation of fatigue
- Increased attention
Immediate physiological effects  
(Majumder & White 2012)

• Signs of activation of the adrenergic system:  
  – Increased HR & resp rate  
  – Hypertension  
  – Decreased appetite  
  – Psychomotor stimulation  
  – Euphoric state  
• NT from hypothalamus  
  – Increase in body temperature
4 broad types of adverse health effects

(Degenhardt & Hall 2012)

(i) Acute toxic effects, OD

(ii) Acute effects of intoxication
  • Accidental injury
  • Violence

(iii) SUD

(iv) Sustained chronic use
  • Chronic disease, eg CVD
  • Blood-borne bacterial & viral infections
  • Mental disorders
Polydrug use
(Darke et al, 2008)

Increases toxicity:

- ETOH/MA \( \uparrow \) HR, BP
- Heroin/MA \( \uparrow \) O\(_2\) demand with \( \downarrow \) respiration
  (cardiac failure)
- MA/cocaine
  \( \uparrow \) vasoconstrictive & cardiotoxic effects

Multiple substances are detected in around half of fatal MA toxicity cases
(i) Acute toxic effects
(Darke et al, 2008)

• Toxic reactions can occur irrespective of
  – Dose
  – Frequency of use
  – Route of administration
  – With small amounts

• No well delineated dose response for MA
  – Dose and frequency may influence likelihood
  – Accumulated damage from L/T use → CHD → MI
(i) Acute toxic effects (cont’d)
(Darke et al, 2008)

• Physical symptoms of toxicity include:
  – Excited delirium
  – Nausea & vomiting
  – Chest pain
  – Tremors
  – Increased body temp
  – Increased heart rate
  – Breathing irregularities
  – Seizures
(i) Acute toxic effects (cont’d)

(Darke et al, 2008)

- Psychological symptoms of toxicity include:
  - Extreme anxiety
  - Panic
  - Extreme agitation
  - Extreme paranoia
  - Hallucinations
  - Excited delirium
(i) Acute toxic effects (cont’d)

(Degenhardt & Hall, 2012)

• Psychostimulant overdoses can trigger fatal:
  – Cardiac arrhythmias
  – Stroke

• Otherwise rare in healthy young adults

• Crude mortality rates similar to opioids
(ii) Acute effects of intoxication
(Degenhardt & Hall, 2012)

• Compared to non-users, more common causes of death include:
  – Road traffic crashes
  – Falls
  – Drowning
  – Injuries
(iii) Substance use disorder

- DSM V: (substance use disorder)
  - Cluster of cognitive, behavioural and physiological symptoms
    - Impaired control (criteria 1-4)
    - Social impairment (criteria 5-7)
    - Risky use (criteria 8 & 9)
    - Pharmacological criteria (tolerance & withdrawal; criteria 10 & 11)
  - Mild (2-3), moderate (4-5), severe (6 or more)
(iii) Substance use disorder (cont’d)

(Degenhardt et al 2013; Darke et al 2008)

• MA use disorder:
  – may be chronic or involve bingeing with brief drug free periods
  – Associated strongly with smoking and injecting (rapid bioavailability) and potency of the drug
(iv) Adverse health effects

(Degenhardt et al 2013; Darke et al 2008)

- BBV transmission
  - Sharing used injecting equipment
  - Sexual risk behaviour
    - MA use ↑ sexual arousal
    - Some people use it to enhance sex
    - Elevated levels of sexual activity & unprotected sex
    - Among homosexual men who use MA there is an elevated incidence of HIV
(iv) Adverse health effects (cont’d)

(Jenner, 2012)

• Other physical consequences
  – Gum disease, teeth grinding and decay
  – Poor sleeping patterns and insomnia
  – Weight loss and under nutrition
  – Dehydration
  – Kidney problems (prolonged constriction of blood vessels & poor hydration)
  – Lowered immunity
  – Skin lesions (associated with repetitive picking)
(iv) Adverse health effects – mental health

(Darke et al 2008)

• MA use associated with elevated rates of
  • Psychosis
  • Mood and anxiety disorders
  • Violent behaviours
  • Cognitive deficits
(iv) Adverse health effects – mental health (cont’d)  (Darke et al 2008)

- Psychostimulant use can induce psychosis
  - Typically transient (hrs - days)
  - Delusions (persecution)
  - Hallucinations (commonly auditory & visual)
  - May be emotionally labile, agitated & hostile
  - Repetitive, stereotyped behaviour & social withdrawal
(iv) Adverse health effects – mental health
(cont’d) (Darke et al 2008; Degenhardt & Hall, 2012)

• Depressive and anxiety symptoms - common
  • Majority report lifetime history of depression
  • Rates of suicidal ideation & attempted suicide are high
  • A quarter of psychostimulant users have a lifetime history of attempted suicide (vs <5% of general population)
  • Depression, suicide and anxiety associated with longer use, frequent use, & dependence.
  • Depression + intoxicating effects of the drugs + stresses of an illicit drug dependent lifestyle ↑ risk.
(iv) Adverse health effects – violence

(Darke et al 2008; Degenhardt & Hall, 2012)

Chronic use of MA can ↑ aggressive behaviour

Acute intoxication can ↑ aggressive response

Psychosis can be accompanied by violent behaviours

High rates of pre-existing conduct disorder
(iv) Adverse health effects - violence (cont’d) (McKetin et al 2014)

• Longitudinal study (n=278): *frequent use* associated with more violence

• *Psychotic* symptoms and heavy *alcohol* use increased the risk of violent behaviour

• Violence was characterised by *interpersonal violence* ranging from altercations to unprovoked physical attacks
(iv) Adverse health effects – Neurotoxicity

(Jenner, 2012)

- Chronic use of MA → neurochemical abnormalities

- Consequences:
  - Concentration
  - Memory
  - Decision-making
  - Irritability, insomnia, mood swings, loss of interest, lack of motivation
Effective responses  
(Degenhardt et al., 2013)

• Behavioural interventions are effective
  – Research into how to scale these up needed

• Needle & syringe programs

• HIV antiretroviral therapy
Health and well-being
(Butler, Wheeler & Sheridan, 2010)

• Health and well-being information:
  – Mental health
  – Diet
  – Skincare
  – Sleep hygiene
  – Smoking cessation /reduction
  – Other drugs
  – Physical activity
Healthy Lifestyles Approach

• Substance users care about their health

• Like the approach

• Dr Pete Kelly (University of Wollongong)
  – Groups or individual
  – Peer delivery
  – Telephone
Cardiovascular Disease

(#1 killer of people who have had substance abuse problems)
Isn’t cutting down / quitting drugs enough???

(what are you trying to do to me!)
Multi-component interventions: feasible, effective, and more efficient (Spring et al 2010)
Healthy Lifestyles Approach

• While addressing substance use
  – Mental health
  – Smoking
  – Diet
  – Physical Activity
  – Others

• Engagement and flexibility
Conclusions

• Address physical AND psychological harms

• Effective public health responses

• Consider a healthy lifestyles approach