

**Common poly-substance abuse:
MDMA, Ketamine, &
Methamphetamine
Clinical detection and management**

Prepared by Dr. S.P. LEUNG
Castle Peak Hospital
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Medical practitioner should provide care and treatment for drug misusers, which includes:

- **identification** of drug abuse -
empathic, non-judgmental attitude
to encourage disclosure
- promotion of **harm minimization**-
 - include health, social, legal and financial problems
till drug users is ready and able to come off drugs
 - through education with **accurate information**
- **referral** to specialist drug service
- **share care** with service specializing in treatment

MDMA

(methylenedioxyamphetamine)

On the site or at emergency service:

1. Side effects of the drug include mild psychomotor restlessness, bruxism, trismus, anorexia, diaphoresis, hot flashes, tremor, palpitation, dry mouth and piloerection. These are transient effects experienced by healthy, occasional users ingesting relatively moderate dosages. There were more dangerous sequelae reported to occur in a small minority of individuals taking it, often in the context of significant premorbid pathology (physical or psychiatric), adverse settings, polysubstance and alcohol use, and excessive dosing.

2. Case reports over the past years of isolated instances of **catastrophic hyperthermic reactions** leading to **disseminated intravascular coagulation (DIC)**, **rhabdomyolysis**, **acute renal failure**, and, on occasion, death. All cases occurred in the setting of prolonged vigorous dancing in poorly ventilated environments and were associated with inadequate fluid replacement.

3. The **premorbid physical conditions of the users definitely added risks**. Deaths induced by cardiovascular collapse in those with ischemic heart disease, cardiac conduction defects, cardiomyopathy, and mitral valve prolapse. Cerebrovascular accidents apparently induced by MDMA were reported, and pre-existing neurological vulnerabilities noted.

Treatment:

The acute MDMA reactions with dehydration and hyperthermia may be life threatening, which resemble the combination of **serotonin syndrome** and **neuroleptic malignant syndrome (NMS)**. The detailed treatment recommendation is referred elsewhere.

Doctors should be alerted to the possibility in any patient who exhibits confusion or impaired sensorium, hyperthermia, muscle rigidity, and fever. If it can be established that the patient has been to a rave, or some similar event, this should raise the clinician suspicion that MDMA was ingested. Diagnosis of brain infection, trauma and other drug intoxications should be excluded. Effective hydration using IV fluids and lowering the temperature of the patient with cooling blankets or an ice bath should be attempted. Standard gastric lavage should be used.

Medications commonly used for NMS and serotonin syndrome, like **dantrolene sodium** (a skeletal muscle relaxant that lessens rigidity and hyperthermia), or **bromocriptine** (dopaminergic agonist) that can be concurrently used with the former, and **benzodiazepines/ anticonvulsants** may be used if clinically indicated. Caution should be exercised in the use of **neuroleptics** for physical restraining, because these can exacerbate the syndrome.

At the clinic:

1. Common after-effects can be pronounced, sometimes lasting 24 hours or more. The most dramatic hangover effect is a severe anhedonia. User experiences lethargy, anorexia, decreased motivation, depressed mood, fatigue, and insomnia. This can last for days.
2. MDMA induced **hepatotoxicity** been reported, though considered rare. This may be idiosyncratic toxic to MDMA or its contaminant.

3. **Panic disorder, depression, paranoid psychosis** have been reported. With significant premorbid psychopathology, and often in combination with other drugs or alcohol, frequent use of high dose MDMA does appear to heighten risks for deterioration of psychiatric status.

Treatment:

Psychiatric symptoms like anxiety, panic and depression are usually short term sequelae and subside in a matter of days. Support and reassurance, with brief use of benzodiazepines is all that's required.

Although dependence on MDMA does not occur, some individuals may use the drug compulsively, and they should be referred to substance abuse services for treatment and rehabilitation.

Ketamine

On the site or at emergency service:

1. **Neurotoxic effects** as reported in a survey of recreational use:

- . ataxia
- . slurring of speech
- . dizziness
- . convulsion
- . blurred vision
- . anxiety
- . insomnia

2. The K-hole

- **Catatonic state** with a mask face, an open mouth, fixed staring with dilated pupils, and rigid posturing.
- Social withdrawal, autistic behaviour, and an inability to maintain a cognitive set, impoverished and idiosyncratic thought patterns, and bizarre responses.

3. A **psychotic state** can be induced that resembles closely schizophrenia and incorporates not only positive symptoms, but also negative symptoms and cognitive dysfunction.

4. A case series reporting on ketamine abusers presenting to emergency department (Weiner et al):

- Anxiety, chest pain, and palpitations.
- Tachycardia and nystagmus.
- Severe agitation and rhabdomyolysis.
- Symptoms appeared short-lived and almost all cases were discharged in 5 hours.

Treatment:

Diagnosis should be suspected in patients, especially young ones, who presents with agitation, tachycardia, and either visual hallucination or nystagmus. Symptomatically, patients should be given standard supportive care, as the effect of ketamine is usually short lived. Keep patient in a quiet room, with a minimum of external stimuli, which may prevent agitation. Benzodiazepine should be used for sedation in agitated patients who are at risk for self injury, hyperthermia and rhabdomyolysis. IV fluid should be given to agitated patients at a generous rate till laboratory testing has ruled out rhabdomyolysis. Vital signs and mental status are observed till normalized. If symptoms are not improving after 2 hours of presentation, search for other drugs of abuse or another disease.

At the clinic:

1. **Long term use** has the following adverse effects reported:
 - . decreased sociability
 - . impaired memory and attention
 - . alteration in vision
 - . mental and emotional problems
 - . tolerance and dependence(though no physical withdrawal noted)
2. Ketamine produced a **formal thought disorder**, as well as impairments in working and semantic **memory**. Findings indicate that frequent use of ketamine produces **long-lasting impairments** and users should be informed of these persisting, detrimental effects.

Treatment:

Dependence of ketamine should be referred and treated by drug abuse treatment services.

There is no available treatment for **long-term effects** on memory dysfunctioning and flashback.

Methamphetamine

On the site or at emergency service:

1. Toxic side effects include the following-

Anxiety, restlessness

Sweating, palpitation

Chest pain

Dizziness, hypertension, may be hyperthermia

Cardiac arrhythmias

Hallucination

Violence to self or others

Convulsion, coma and death can occur

2. Physical complications:

- Including catastrophes of the cardiovascular system, e.g. intracranial haemorrhage, arrhythmias, acute cardiac failure.
- As a result of amphetamine's ability to release NA, dopamine and serotonin and to raise blood pressure.

Treatment:

Where a patient exhibits persistent anxiety and agitation, doctor should attempt to focus on stress reduction procedure. Patients who display persistent and severe psychotic symptoms require admission and treatment in a psychiatric unit.

At the clinic:

1. Chronic intoxication associated with **psychosis** that resembles schizophrenia:

paranoid delusion

hallucination

overactivity

repetitive behaviour

aggression

This usually occurs if it has been taken for a long time and the dose has been escalated. This occurs in clear consciousness usually. Usually this **remits within days or weeks of drug cessation.**

2. **Withdrawal**

Fatigue, hunger, depression are experienced when chronic large quantity users withdraw the use.

Depression and suicide is a real risk.

3. **Dependence:**

Intense craving and drug seeking behaviour occur in chronic users.

4. Chronic methamphetamine psychosis (MAP)

Methamphetamine abusers can have episodes of violent behaviour, paranoia, anxiety, confusion, and insomnia. Heavy users also show progressive social and occupational deterioration. Psychotic symptoms can sometimes **persists for months or years after use has ceased**. The paranoia can result in homicidal as well as suicidal thoughts.

5. Other psychiatric disturbances may occur in association with abuse:

- . intoxication delirium
- . mood disorder
- . anxiety disorder
- . sleep disorder
- . sexual dysfunction

Because abuse can be associated with increased sexual activity, often accompanied by poor judgement, abusers are at elevated risk for venereal diseases, including infection with HIV.

6. Abuse during **pregnancy** may result in prenatal complications, increase rates of premature delivery and altered neonatal behaviour patterns.

7. Neurotoxicity

Methamphetamine damages dopamine nerve terminals and kills other neurotransmitters in additional brain pathways. Loss of cells in the hippocampus and cortex could damage memory, cognitive function and decision-making capacity. Loss of striatal cells could lead to serious movement disorders that resemble tardive dyskinesia and Huntington's chorea.

Treatment:

- Currently no medications are available to treat methamphetamine addiction or overdose.
- However, **antidepressant medications** can be prescribed which can serve to combat the depressive symptoms frequently experienced during methamphetamine withdrawal. Antidepressant like Fluoxetine can be effective but care should be taken if SSRI are prescribed while amphetamine continues to be taken, as toxic reactions have been described. Such agents might also be useful in countering exaggerated mood lability or impulsivity associated with postulated decreases of serotonin levels that be caused by high-dose amphetamine abuse.

- **Cognitive behavioural interventions** that help modify a patient's thinking and harmful behaviours and teach skills to cope with stressful situations have been effective.
- Medications are being developed to repair the cognitive impairment due to chronic amphetamine abuse at the present.