

Addictive substances

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Addictive substances are divided into two main groups according to their effect on the CNS:

1. substances causing CNS excitation – hallucinogenic and psychostimulant effect (mydriasis);
2. substances causing CNS depression - addictive narcotics (miosis)

Hallucinogenic substances and psychostimulants

- Cannabinoids (marijuana, hashish);
- amphetamine and its derivatives (Psychoton - amphetamine, Pervitin - methamphetamine, Ecstasy - MDMA), ephedrine, caffeine;
- cocaine;
- LSD;
- psilocybin (psilocybin mushrooms), anticholinergic alkaloids (**Amanita muscaria, jimsonweed**).

Addictive narcotics

- Opiates and opioids (morphine, heroin, codeine, fentanyl, methadone, tramadol).

Psychostimulants

- Psychostimulants are substances with a sympathomimetic effect. They cause CNS stimulation, peripheral catecholamines release, lipolysis stimulation, heat generation, catecholamine reuptake inhibition or MAO inhibition, which is also a mechanism of some antidepressants action. Psychostimulants are used therapeutically for narcolepsy and attention deficit disorders in children, but also as anorexics and illegally produced stimulants (meth, ecstasy).

Effects

- euphoria;
- increased activity;
- confidence and courage;
- removal of barriers;
- reduced need for sleep;
- suppressed feeling of hunger.

Signs of intoxication

- sympathomimetic symptoms (sweating, tremor, tachycardia, mydriasis, hypertension, chills...);
- convulsions and muscle hyperactivity – rhabdomyolysis with renal failure, malignant hyperthermia;
- central respiratory paralysis and pulmonary edema;
- acute myocardial ischemia to heart attack.

Diagnostics

- amphetamines in urine;
- creatinine, CK, myoglobin in blood and urine.

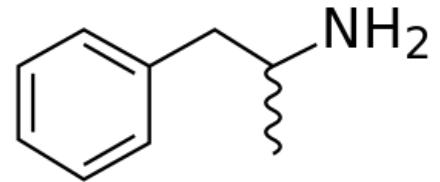
Intoxication management

- do not induce vomiting (risk of convulsions and dysrhythmias), in case of p.o. intake activated charcoal is recommended;
- symptomatic treatment with β -blockers, diazepam, tiapride or haloperidol;
- external cooling or dantrolene, if non-pharmacological method fails;
- artificial ventilation if needed

Cocaine

Cocaine is a psychostimulant with a significant psychostimulant effect (euphoria, feeling of energy and increased productivity). It is used mainly by snorting, smoking or i.v.. It is not that widespread (due to being expensive), its effect is similar to amphetamines, however, it causes a strong psychological addiction without physical dependence (there is no withdrawal syndrome after stopping regular abuse), it has a shorter half-life and therefore shorter-lasting effect than amphetamines.

Intoxication



Amphetamine molecular structure



Cocaine in powder form (as salt)

- hyperkinetic circulation with hyperthermia;
- rhabdomyolysis with renal failure;
- cardiotoxicity (dysrhythmia, ischemia or heart attack);
- hypertension (aortic dissection, intracranial hemorrhage).

Intoxication management

- symptomatic (diazepam, midazolam, nitrates, nifedipine);
- activated charcoal in p.o. administration, other elimination methods are not efficient.

Opiates

By affecting opioid receptors in the CNS, opiates have the following effects:

- analgesic to narcotic effects;
- antitussive effects (depression of the cough center);
- respiratory center inhibition;
- hypothermia, hypotension, bradycardia;
- miosis;
- increase in smooth muscle tone (constipation, gastrointestinal spasms, urinary retention).

Morphine

Basic agonist, administered for its analgesic effects i.m. (onset within 15 mins, lasts 4 hours) and p.o.

Pethidine (Dolsin)

Milder analgesic effects than morphine, shorter-lasting, but doesn't cause such significant respiratory center depression and does not have a spastic effect (can be given for colic)

Fentanyl

Strong analgesic effects, used in neuroleptanalgesia.

Codeine

Central antitussive, 10% is converted into morphine (also analgesic effect).

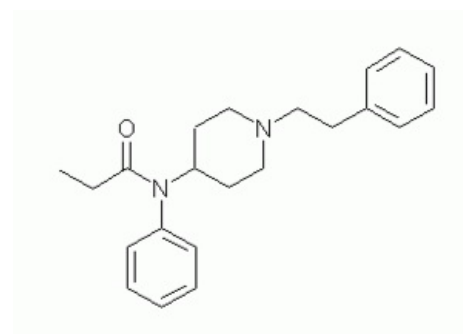
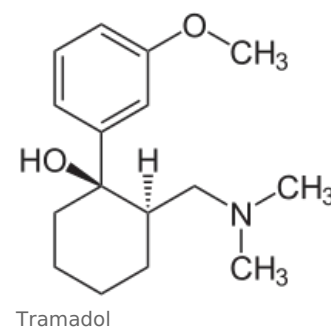
Tramadol (Tramal)

Lower analgesic effect, addictive, is a serotonin and noradrenaline reuptake inhibitor (SNRI (serotonin syndrome risk in overdose)) and acts via binding to μ -opioid receptors on the neuron.^[1] It is metabolized to desmetramadol in the liver, an opioid with stronger binding to μ -opioid receptors.

Methadone

The effects are stronger and longer-lasting than with morphine (including respiratory center depression), although the withdrawal syndrome is not as severe. It is used in morphine withdrawal process (methadone substitution).

 For more information see *Opioid analgesics*.



Links

Related articles

- Substance abuse
- Substance addiction
- Disorders caused by cannabinoids use

Source

- Langenbeck`s medical web page (<https://www.freewebs.com/langenbeck/ostatn.htm>)