

Amphetamines

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- Ice, Krystal, Speed
- Methamphetamine, meth.
- *Amphetamine (illegal in Poland, Germany)*
- drugs: Ephedrine, pseudoephedrine, phentermine, phenmetrazine, methylphenidate^[1]

Pharmacology

- *Mechanism of action – structural similarity to dopamine – phenylalkylamines*
- Indirect sympathomimetics - noradrenaline- like effects
- *Amphetamines release or replace neurotransmitters on the nerve endings*
- Amphetamines - agonists of dopamine, noradrenaline, serotonin

Abuse

- Salts (HCl) – p.o., sniffing, i.v.
- Base – inhalation, smoking
- Usual daily doses 2-100 mg
- Repeated doses in chronic conditions, whiplash, up to 5 g/day
- Symptoms
 - euphoria, increased performance (doping)
 - risky behavior, spurts of thought at the expense of accuracy, impaired judgement
 - aggressiveness, irritability, psychological lability, anxiety
 - hypertension , anorexia nervosa – suppression of the feeling of hunger
- *Duration of stimulation: 2-4 hours*
- Overdose: restlessness, inability to concentrate, hallucinations, convulsions

Chronic abuse

- weight loss
- damage to the cardiovascular system, development of hypertension, cerebral hemorrhage
- psychoses, *punishments* , depression , suicidal tendencies
- the development of psychological dependence
- development of tolerance

Enantiomer selectivity

- Catecholamines (dopamine , ...) and amphetamines - asymmetric atom C*
- Number of asymmetries – number of enantiomers
- Endogenous adrenaline and noradrenaline are levorotatory and have higher affinity for receptors and transport proteins than dextrorotatory enantiomers
- Amphetamine acts as an indirect sympathomimetic. It has one asymmetric carbon. The dextrorotatory enantiomer (dextroamphetamine) has about 4 times stronger CNS stimulatory effects than the levorotatory isomer
- Ephedrine contains 2 centers of asymmetry and therefore has 4 possible optical isomers:

- (+) a (-) ephedrine
- (+) a (-) pseudoephedrine
- The most biologically effective is (-) ephedrine^[1]

=== Ephedrine, Pseudoephedrine ===

- The plant *Ephedra vulgaris* – a thousand-year tradition of use in China
- Ephedrine is found in a number of plants
- Synthetic ephedrine, pseudoephedrine
- Ephedrine, pseudoephedrine components of composite medicinal products:
 - broncholytics
 - antitussive
 - antipyretics
 - analgesics (NUROFEN)
 - venopharmaceuticals
 - anorexic (norpseudoephedrine)
- Ephedrine – direct and indirect sympathomimetic
- Psychostimulant chronic effect - addiction
- Ephedrine, pseudoephedrine – precursors of the illegal synthesis of methamphetamine

[1]

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- The leaves of the *Catha edulis* plant are chewed - Arabia
- They contain cathinone and nor-pseudoephedrine
- Cathinone is metabolized to norephedrine^[1]

MDMA, XTC, ECTASY

- 3,4-methylenedioxyamfetamin
- MDMA and similar derivatives – entactogens, stimulants
 - en (Greek) – inside
 - tactus (Latin) – touch
 - gen (Greek) – to produce
- MDMA – pleasant empathetic feelings, *penicillin of the soul*



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Pharmacology

- MDMA – a serotonin agonist
- Sympathomimetic reaction (hyperthermia , hyperactivity, salivation, mydriasis))
- *Massive release of serotonin from nerve endings into the synapse - decrease in nerve endings - increase in extracellular serotonergic activity, non-specific stimulation of receptors in the CNS - serotonin syndrome*
- MDMA also releases dopamine (cytotoxic) which replaces serotonin in nerve endings – cell damage triggers unwanted biochemical reactions – neurotoxicity of MDMA
- Repeated use – sensitization, allergy
 - prolongation and intensification of serotonergic syndrome
 - increasing the toxicity of further doses

Abusus

- Tablets po – different logos, shapes, sizes, colors, unknown content
- *Effective single doses of 50-200 mg*
- Pleasant desirable symptoms: empathy, stimulation (dance drug)
- Side unpleasant symptoms:
 - dry mouth
 - *trismus (difficulty opening the mouth)*
 - perspiration
 - fainting

Chronic abuse

- depression
- insomnia
- psychosis
- psychological dependence
- tolerance

* *development of sensitization (allergy)*

Health complications

- tachycardia , arrhythmia , cardiac collapse

- serotonin syndrome – sweating, tremors, hyperthermia , rhabdomyolysis, disseminated intravascular coagulation (DIC) – death
- dehydration, hyponatremia , circulatory failure
- liver failure (rare)
- in chronic patients – cognitive disorders, psychoses, hypertension, vascular events

Risk factors

- unknown contents of illegal tablets, drug cocktails, ethanol
- individual state of health, receptivity

Ecstasy tablets

- Tablets po – different logos, shapes, sizes, colors, unknown content
- *Dance drugs, New Synthetic Drugs (NSDs), "Designer drugs"*
- Expected Effect – Stimulant and Psychedelic (Empathy)
- Psychedelics – natural hallucinogens (mescaline, DMT, etc.)
- MDMA, a controlled psychotropic substance

⚠ NSD - small change in structure - other pharmacological action - dangerous !!! ⚠^[1]

Linkes

Related articles

- Substance Abuse • Drug Addiction and Illicit Production and Possession of Narcotic Substances • Opioid Abuse
- Amphetamines • Cocaine • Cannabinoids • Hallucinogens • LSD • Psychotropic drugs • Barbiturates • Benzodiazepines • Ethanol
- Cannabinoid use disorders • Opioid use disorders

References

1. BALÍKOVÁ, Marie. *Abusus a intoxikace* [online]. [cit. 2012-03-09]. <<https://el.lf1.cuni.cz/p56355604/>>.