Intoxication with local anesthetics

Undesirable effects are caused by the wrong method of administration, the effect of local anesthetics or additives. According to the mechanism of the toxic reaction, we distinguish between ***relative overdose'*** *(in the case of incorrect local anesthetics) intravenously, in the case of a changed effect of the anesthetic due to the patient's health condition (hepatopathy, chronic renal insufficiency, asthenia, liver load from a large amount of other pharmaceuticals, elderly patients and slower metabolism,..)) and* **absolute overdose** *(iatrogenic damage to the patient by administering an excessive amount [[Anesthetics (dental medicine)|anesthetics]]).*

The course of the toxic reaction and its manifestations

The toxic reaction occurs in two phases with different symptoms.

1. phase = ***excitatory, irritating'***

- the patient gives the impression of being drunk, is verbose, speaks chaotically
- paresthesia of the lower limbs
- increased salivation, sweating
- nausea, dizziness, ringing in the ears
- increased pressure and pulse
- twitches mimic muscles

2. phase = ***depressive***

- tonic-clonic convulsions
- metallic taste in the mouth
- depression CNS → failure of vital functions → unconsciousness

Systemic toxicity

LA is absorbed into the bloodstream and thus affects the CNS and Cardiovascular System. Can be solved at ARU by administration of non-specific antidotes (takes the anesthetic out of the blood circulation).

Central effects

- Drowsiness, "drunkenness" or euphoria, nervousness, blurred vision, ringing in the ears;
- at a higher dose − nausea, vomiting, nystagmus (vegetative symptoms);
- in extreme − central tonic-clonic convulsions (like epilepsy) up to unconsciousness, respiratory failure, exitus.

Therapy:

- immediate, symptomatic, need to administer Diazepam in convulsions;
- oxygen against hypoxemia and acidosis.

Cardiovascular toxicity

- The need to support the heart with adrenaline;
- blockade of Na^+ channels causes bradycardia, peripheral dilation, drop in blood pressure, cardiocollapse, exitus;
- LAs cross the placenta and may cause fetal bradycardia.

Therapy:

- cardiopulmonary support, correction of acidosis, SM − adrenaline (ventricular fibrillation may occur at high doses!!!).

Allergic reactions

- They are often formed after esters, which have a small molecule and act as haptens;
- rare after amides;
- manifestations: exanthema, enanthema, edema, asthma attack, anaphylaxis.

Therapy:

- adrenaline, corticoids, midazolam for restlessness.

Vaso additive effect

- Reduces the speed of resorption, prolongs the effect, reduces the dose of LA, reduces the possibility of intoxication, reduces bleeding - **adrenaline**;
- side effects are: ischemia, necrosis, tachycardia, arrhythmia;
- contraindications to adrenaline administration:
  - iMAO − antidepressants/thymoeretics (moclobemide);
  - catecholamine reuptake inhibitors − SSRI (sertaline) − antidepressant;
  - tricyclic antidepressants (imipramine, amitriptyline, dosulepin).

Links

Related Articles

- Local anesthetics

References

- LINCOVÁ, Dagmar, et al. *Basic and applied pharmacology.* 1. edition. GALÉN, 2002. 601 pp. ISBN 80-7262-168-8.
- GROSS, Jan. *General complications of local anesthesia* [lecture for subject Oral surgery 1, specialization Dentistry, 1. LF UK]. Prague. 10/21/2014.