

Pharmacotherapy in emergency resuscitation

Pharmacotherapy

The article is based on the official recommendations of the American Heart Association Guidelines 2010, which are largely compatible with the European Guidelines 2010.

During resuscitation, pharmacotherapy has the task of increasing blood flow to important organs (heart, brain) and inducing the restoration of circulation (return of spontaneous circulation, ROSC). So far, no clinical study has shown an increase of successful survival of patients where pharmacotherapy was used during resuscitation (although there is a slight positive inclination). The main benefit of pharmacotherapy is its positive effect on ROSC, which is sufficiently proven. The pharmacotherapy procedures presented here are general and it should be noted that for specific cases it is appropriate to consider other possible pharmacotherapeutic solutions. The administration of drugs must not result in a delay in indirect cardiac massage.

Possible methods of drug administration during an emergency resuscitation

Intravenous (peripheral) administration (iv)

In the field, this is the optimal choice for drug administration. Each dose of the drug should be followed by a bolus of 20 ml of liquid, accelerating its transport to the central riverbed.

 For more information see *Securing Venous Access*.

Central venous catheter

Theoretically, it will allow a faster effect of the drug, but it can be a contraindication to fibrinolytic therapy, regardless of the difficulty of its insertion.

 For more information see *Central Venous Catheter*.

Intraosseous (IO) administration

This method of drug administration is recommended if it cannot be done in the iv application as well. In this case, the dosage and the effects of the drugs are comparable to iv application.

 For more information see *Intraosseous Infusion*.

Endotracheal administration

Administration is done through an endotracheal tube. The drugs adrenaline, vasopressin, lidocaine, atropine and naloxone have been demonstrably absorbed through the trachea. The necessary data are not available for amiodarone. In the case of endotracheal administration, the dosage should be increased by 2-2.5x and the dose should be diluted in 5-10 ml of sterile water. Current Guidelines for Cardiopulmonary Resuscitation do not recommend endotracheal administration. Intraosseous (IO) administration also comes to the fore.

 For more information see *Endotracheal intubation*.

Drugs recommended for routine use in resuscitation

Vasopressors

- Adrenaline: Vasoconstrictor with an effect on α - and β -adrenergic receptors. It increases the perfusion pressure of the coronary arteries and the perfusion of the brain. Method of administration: iv/io, dose 1 mg every 3-5 minutes.
- Vasopressin : Nonadrenergic vasoconstrictor, its effect is comparable to adrenaline. Method of administration: iv/io, dose 40 units.

Antiarrhythmics

- **Amiodarone**: Given for shockable rhythms after the third shock. Method of administration: iv/io, bolus 300 mg (alt. 5 mg/kg), second dose 150 mg.
- Lidocaine: Considered as an alternative to amiodarone if this is not available. It appears to have a positive effect on ROSC. Method of administration: iv, dose of 1 or 1.5 mg/kg, further doses of 0.5-0.75 mg every 5/10 minutes up to a maximum dose of 3 mg.
- Magnesium sulfate: Its use is recommended only in case of torsades de pointes (a rare form of ventricular

tachycardia).

Drugs not recommended for routine use in resuscitation

- Atropine : A drug previously recommended for PEA bradycardia and asystole. No positive effect on ROSC or patient survival has been demonstrated in clinical studies.
- **Sodium bicarbonate**: This buffer (and buffers in general) has no proven positive effects, on the contrary, it can lead to intracellular acidosis or can suppress the effect of catecholamines when administered simultaneously. Its use is recommended in special cases (e.g. overdose with tricyclic antidepressants)
- Calcium : Has no clear effects.
- Fibrinolytics: Although initial studies were promising, large studies have not proved the effect of fibrinolytics on the rate of successful resuscitation. Their administration is possible in the event of an arrest caused by a pulmonary embolism.

Therapy for shockable rhythm

It refers to ventricular fibrillation (VF) and ventricular tachycardia (VT). The scheme for extended emergency resuscitation is followed . Adrenaline and amiodarone are administered after the third shock and subsequently (dosage and method of administration above).

Therapy for non-shockable rhythm

Immediate administration of adrenaline is recommended, amiodarone is not used in this case.

Links

Related Articles

- Advanced emergency resuscitation
- Equipment for emergency resuscitation
- Emergency resuscitation in childhood age
- Cardiopulmonary resuscitation of the newborn
- Electroimpulse therapy in emergency resuscitation
- Principles of initiation and termination of emergency resuscitation
- Post-resuscitation care
- Cardiopulmonary resuscitation
 - Basic emergency resuscitation
 - Advanced Emergency Resuscitation

External links

- American Heart Association (<https://www.heart.org/en/>); AHA 2010 Guidelines (<https://eccguidelines.heart.org/index.php/circulation/cpr-ecc-guidelines-2/>)
- European Resuscitation Council (<https://www.erc.edu/>); ERC 2010 Guidelines (<https://cprguidelines.eu/2010/>), ERC 2015 Guidelines (<https://cprguidelines.eu/>)
- Česká resuscitační rada (<http://www.resuscitace.cz/>)
- Zachrannasluzba.cz (<https://www.zachrannasluzba.cz:443/>)

References

- FIELD, John M – HAZINSKI, Mary F. , et al. 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science. *Circulation* [online]. 2010, y. -, vol. 122, p. S640-S656, Available from <<https://www.ahajournals.org/doi/full/10.1161/circulationaha.110.970889>>. ISSN 0009-7322. DOI: 10.1161/ (<http://dx.doi.org/10.1161%2F%E2%80%8B>).