

Treatment of chronic heart failure

Heart failure is a state, when the heart is not able to pump enough blood.

The drugs used for treatment of chronic heart failure are divided into two groups:

Drugs reducing strain on myocardium

- ACE inhibitors,
- AT1 - receptor blockers,
- Other vasodilators,
- Beta-blockers,
- Diuretics.

Drugs with positive inotropic effects

- Heart glycosides,
- Other drugs with positive inotropic effects.

Drugs reducing strain on myocardium

ACE inhibitors

- Angiotensin converting enzyme inhibitors. They work by decreasing the concentration of circulating angiotensin II, leading to reduced degradation of bradykinin, which stimulates vasodilatory NO synthase.
- Simultaneously suppresses the sympathetic nervous system - they are also used in the treatment of arterial hypertension.
- There is an increase in cardiac output, which improves organ perfusion.

Contraindications

Pregnancy, hyperkalaemia, bilateral renal artery stenosis, angioneurotic edema.

Side effects

Irritant cough, skin rash, angioneurotic edema.

Examples

Enalapril, lisinopril, perindopril, ramipril.

AT1 receptor blockers

- They antagonize the action of angiotensin on AT1 receptors (the difference from ACE inhibitors is, that they do not lead to a delayed degradation of bradykinin, which is responsible for ACE inhibitors side effects).
- They are recommended for intolerance to ACE inhibitors.

Contraindications

Pregnancy, hyperkalaemia, bilateral renal artery stenosis.

Examples

Losartan, valsartan, telmisartan, candesartan.

Other vasodilators

- A wide group of substances whose mechanism and site of action differ.
- We divide them into arterial, venous and combined vasodilators (arteries and veins).

Examples

Dihydralazine, nitroglycerin.

Beta-blockers (<https://www.wikilectures.eu/w/Beta-blockers>)

- They suppress the sympathoadrenal system, reduce the heart rate and prolong diastole.
- They are used in stabilized patients.

Contraindications

More pronounced bradycardia, AV conduction disorders, hypotension, bronchial asthma.

Examples

Metoprolol, succinate, carvedilol, bisoprolol, nebivolol.

Diuretics

- Used only with congestion in small or large circulation.
- Indicated especially in mild and moderate heart failure - swelling occurs.

Contraindications

Patients without swelling, circulatory overload and dyspnoea.

Side effects

Hypokalaemia (loop and thiazide diuretics only).

Examples

- *loop* - furosemid,
- *thiazide* - hydrochlorthiazid,
- *aldosterone receptor inhibitors* - spironolacton.

Drugs with positive inotropic effects

Cardiac glycosides

- These are cardiotonics, which are substances that increase myocardial contractility.
- They induce ionic changes caused by inhibition of $\text{Na}^+ / \text{K}^+ \text{-ATPase}$ in cardiomyocytes.
- They alleviate symptoms, but do not improve the prognosis of the disease.

Side effects

They are relatively common - anorexia, nausea, bradycardia, etc.

Examples

Digoxin.

Other drugs with positive inotropic effects.

- These are drugs given for short periods in acute conditions (long-term use has a negative effect).
- Indications are acute heart failure or exacerbation of chronic failure.

Sympathomimetics

Examples

Dopamin, dobutamin.

Inhibitors of phosphodiesterase III

- I.v. application especially in acute heart failure.

Examples

Amrinon, milrinon.

Calcium sensitizers

- They increase the sensitivity of troponin C to calcium.
- They are used as adjunctive therapy in acutely decompensated chronic heart failure.

Examples

Levosimendan.

References

References

1. LINCOVÁ, Dagmar and Hassan FARGHALI, et al. *Basic and applied pharmacology*. 2nd edition. Prague: Galén, 2007. 672 pp. ISBN 978-80-7262-373-0 .

2. PERLIK, Frantisek. *Basics of pharmacology*. 2nd edition. Prague: Galén, 2011. ISBN 978-80-7262-759-2 .

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