Adrenergic Drugs

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What are adrenergic drugs?

Adrenergic drugs are medications that stimulate certain nerves in your body. They do this either by mimicking the action of the chemical messengers epinephrine and norepinephrine or by stimulating their release. These drugs are used in many life-threatening conditions, including cardiac arrest, shock, asthma attack, or allergic reaction.

How they work

Adrenergic drugs stimulate the nerves in your body's sympathetic nervous system (SNS). This system helps regulate your body's reaction to stress or emergency. During times of stress, the SNS releases chemical messengers from the adrenal gland. These chemical messengers act on your body to increase heart rate, sweating, and breathing rate and to decrease digestion. This is sometimes called the "fight or flight" response.

Adrenergic drugs have similar structures as the chemical messengers that your body produces during times of stress, such as epinephrine and norepinephrine. Certain areas called adrenergic receptors receive the messages from epinephrine and norepinephrine that tell your body how to respond. Adrenergic drugs also interact with these receptors. They can mimic epinephrine and norepinephrine and bind with the receptors, causing the fight or flight responses. These drugs can also bind with the receptors to stimulate the release of epinephrine and norepinephrine.

Adrenergic drugs can help do the following:

- increase blood pressure
- constrict blood vessels
- open the airways leading to the lungs
- increase heart rate
- stop bleeding

Types of adrenergic drugs and their uses

Each type of adrenergic drug treats different conditions depending on which receptors are targeted. The specific action of the drug also depends on whether the drug acts directly as a chemical messenger or indirectly by stimulating the release of chemical messengers.

Bronchodilators

Bronchodilators open up the bronchial tubes, or air passages. These adrenergic drugs act on the beta receptors directly. When they bind with beta-2 receptors, they cause the airways leading to the lungs to open up. This helps improve breathing in patients with respiratory diseases such as:

- asthma
- chronic obstructive pulmonary disease (COPD)
- emphysema
- bronchitis

Examples of bronchodilators include:

- albuterol
- formoterol
- levalbuterol
- olodaterol
- salmeterol

Vasopressors

Vasopressors can act on the alpha-1, beta-1, and beta-2 adrenergic receptors. They also can act on dopamine receptors. These drugs stimulate smooth muscle contraction in the blood vessels. This causes your blood vessels to become narrow. This effect also causes your blood pressure to increase.

Increasing blood pressure can help treat shock. Narrowing blood vessels can help stop bleeding. It can also help keep anesthetics (drugs that numb your body) from spreading by closing off nearby blood vessels.

Certain vasopressors may also be used for colds or allergies. They can shrink the swollen blood vessels in the mucous membranes of your nose. These drugs are often referred to as nasal decongestants.

Examples of different vasopressors include:

- ephedrine
- epinephrine
- dopamine

phenylephrine
pseudoephedrine
oxymetazoline

Cardiac stimulators

Cardiac stimulators can be used to stimulate and restore the heart beat. They're used if your heart stops beating suddenly because of electrocution, suffocation, or drowning. When this happens, epinephrine can be injected directly into your heart to help make it start beating again.

Other considerations

If you're thinking about an adrenergic drug, you should also consider side effects and your own medical history. Side effects of adrenergic drugs vary and depend on the specific drug you're taking. Not all people will experience all possible side effects of each adrenergic drug. Likewise, not every adrenergic drug is right for every person. Health conditions other than what you need to treat with an adrenergic drug can play a role in deciding which drug is right for you. You can discuss all of these factors with your doctor to find a good choice.