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#DST

# Sympathomimetics

- Overview: Sympathomimetics are drugs that mimic the effects of catecholamines,like epinephrine norepinephrine. They stimulate adrenergic receptors to produce various physiological responses, particularly in the cardiovascular system, and are used in various medical conditions.

Catecholamines:

- Key neurotransmitters include:
  - Epinephrine
  - Norepinephrine
  - Dopamine
  - Fenoldopam
  - Dobutamine
- Mode of Action:

Direct stimulation of adrenoceptors.

Displacement of stored catecholamines from adrenergic nerve endings (e.g., amphetamine, tyramine).

Inhibition of catecholamine reuptake (e.g., cocaine, tricyclic antidepressants).

- Pharmacodynamics:

a. Cardiovascular System:

Regulation of peripheral vascular resistance and venous capacitance through catecholamines.

Effects on blood vessels and heart function mediated by specific receptor interactions.

b. Heart:

Predominantly mediated through β1 receptors.

Positive chronotropic effect: increases heart rate.

Positive dromotropic effect: increases conduction velocity in the AV node.

- Specific Sympathomimetics:

a. Catecholamines:

Include epinephrine, norepinephrine, dopamine, fenoldopam, dobutamine.

b. Noncatecholamines:

Include phenylephrine, amphetamine, methamphetamine, methylphenidate, and others.

- Metabolic Effects:

Influence on glucose metabolism and lipolysis.

Increase in metabolic rate and energy expenditure.

- Effects on Endocrine Function:

Modulation of hormone release, including insulin and glucagon.

What happens to bronchial smooth muscles when β2-receptors are stimulated?

A. Bronchial smooth muscles remain unchanged, with no effect on airflow.

B. Bronchial smooth muscles contract, leading to bronchoconstriction.

C. Bronchial smooth muscles thicken, reducing airway diameter.

D. Bronchial smooth muscles relax, leading to bronchodilation.

What is the effect of β2-receptor stimulation on the pregnant human uterus?

A. Contraction of the uterine muscles

B. Stimulation of uterine contractions

C. Relaxation of the uterus

D. Increased uterine tone

What metabolic effects result from β3-receptor stimulation?

A. Increased glycogenolysis in the liver

B. Enhanced insulin release from the pancreas

C. Increased potassium uptake into cells

D. Increased lipolysis and fatty acid release

Which neurotransmitters are also known as catecholamines?

A. Glutamate and GABA

B. Serotonin and dopamine

C. Acetylcholine and norepinephrine

D. Epinephrine, norepinephrine, dopamine

What is the primary action of epinephrine on adrenoceptors?

A. Primarily acts on β2 receptors to cause vasodilation in all blood vessels

B. Only stimulates α1 receptors, causing vasoconstriction without cardiac effects

C. Stimulates all adrenoceptors, increasing heart rate and vasoconstriction

D. Inhibits adrenoceptors, leading to decreased heart rate

What is one mode of action for sympathomimetics?

A. Direct stimulation of adrenoceptors

B. Direct inhibition of adrenoceptors

C. Inhibition of acetylcholine release

D. Stimulation of serotonin receptors