Alpha-2 Agonists (Sympathoplegics)

α₂ agonists are a class of medication which act on α₂ adrenergic receptors to yield a decreased sympathetic outflow centrally. By decreasing sympathetic outflow, these drugs treat hypertensive symptoms. Clonidine, is a commonly used antihypertensive drug which can lead to rebound hypertension if therapy is abruptly ceased. α-Methyldopa is another antihypertensive agent, which is particularly helpful in pregnancy, as it treats pregnancy-induced hypertension and pre-eclampsia. Along with its α₂ agonist activity, it also works by interrupting dopamine formation. This drug, however, may result in a Coomb's+ hemolytic anemia.



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Indications

Hypertension
Hiker-BP
Drugs of this class are used to treat hypertension, as they reduce peripheral resistance by stimulating presynaptic ?₂adrenoreceptors in the central nervous system.

Renal disease
Kidneys
These drugs may be used in patients with renal disease as they do not cause a decrease in blood flow to the kidney.

Mechanism of Action

Centrally acting Alpha-2 Agonist
C-Brain on Afro (2) Tutu Dragonist
The primary mechanism of action of alpha-2 agonists is stimulation of presynaptic alpha-2 receptors in the central nervous system. Drugs of this class are centrally acting and decrease sympathetic outflow, as they activate medullary presynaptic ?₂ adrenoceptors. Remember that ?₂ activation decreases sympathetic outflow.

Drugs

Clonidine
Clown-dine
Clonidine activates α receptors, which causes inhibition of norepinephrine release from synaptic vesicles. Clonidine is frequently administered with a diuretic, and may produce side effects of lethargy, dry mouth and constipation.

Rebound Hypertension
Bouncing Hiker-BP
An adverse side effect of clonidine includes severe rebound hypertension in the case of abrupt withdrawal.

Alpha-Methyldopa
Afro Metal-dough-boy
Methyldopa decreases total peripheral resistance by reducing sympathetic outflow from the CNS. It is used to treat moderate or mild hypertension and can be used together with a diuretic for increased effect.

Pregnancy
Pregnant-woman
This drug may be used to treat hypertension during pregnancy.

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Coombs (+) Hemolytic Anemia

Positive-Comb Hemolysing-RBCs from Anemia-Anemone

Methyldopa usage may lead to drug-induced immune-mediated hemolysis, leading to a positive direct Coombs test.

SLE Like Syndrome

Dressed like a Loopy-butterfly

Patients taking methyldopa may develop an SLE-like syndrome, with symptoms like fever, pericarditis, arthralgias and malaise, with positive anti-nuclear antibodies.

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