Tricyclic Antidepressants (TCAs) Overview

Tricyclic antidepressants, named for their three-ringed chemical structure, are drugs indicated for a wide range of presentations, including depression, bedwetting, OCD, and fibromyalgia. These drugs are lipid soluble and rapidly absorbed, and exhibit their effects by blocking serotonin and NE reuptake transporters, leading to increased availability of serotonin and NE neurotransmitters. There is a wide range of side effects caused by these drugs and patients should be monitored when they begin treatment. Some side effects can be described by the Tri-Cs; which are convulsion, coma, and cardiotoxicity (in the form of arrhythmias), and are likely related to the anti-histamine and anticholinergic effects of this drug. These drugs display adverse CNS stimulant effects, such as mania, agitation, seizure, confusion, and tremor. TCAs display antimuscarinic, atropine-like side effects, such as impaired gastric motility, dry mouth, blurry vision, increased temperature, and urinary impairment. Postural hypotension is an alpha-1 blockade effect of this drug class.



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Mechanism of Action

Blocks Serotonin and NE Reuptake
Block in Silver-tonic and North-epi-pen Reuptake-tube
TCAs modulate neurotransmission by blocking 5-HT and NE transporters. This leads to elevated synaptic concentrations of the neurotransmitters, respectively. It is important to consider that TCAs do not have much affinity for dopamine (3,4-dihydroxyphenethylamine, DA) transporters, and thus have limited effect on this particular neurotransmitter.

Lipid-soluble
Lips
TCAs are highly lipid-soluble and therefore, rapidly absorbed.

Side Effects

Adverse CNS Effects
Attacked CNS Brain
These drugs lead to CNS stimulation and cause a wide range of presenting symptoms, such as confusion, mania, agitation, tremor, seizures, and sedation.

Anticholinergic
Ant-tie-cola
Side effects tied to the antimuscarinic properties of these medications include impaired gastric motility, dry mouth, blurry vision, increased temperature, and urinary impairment.

Antihistamine
Ant-tie-history-man
Tricyclic antidepressants exhibit antihistamine effects, with the most severe manifestations being seizures and arrhythmias, though uncommon. There are also minor anti-histamine symptoms, which mostly mimic anticholinergic effects.

Tri-C: Convulsion, Coma, Cardiotoxicity
Triceratops with Converse, Combs, and Heart with Toxic-green-glow
A major collection of side effects attributed to TCAs can be described as the three C's. These are convulsions, coma and cardiotoxicity. Cardiac effects are predominantly due to sodium channel blockade, and these cardiotoxic effects can take the form of QRS widening, QT prolongation and torsades de pointes. Additional side effects of these drugs include hyperpyrexia and respiratory depression.

Blocks Alpha1 Receptors
Blocking the Afro (1) Wand Receptor
Tricyclic antidepressants display alpha-1 blockade effects and can lead to postural hypotension.

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