Class III Antiarrhythmics (K+ Channel Blockers)

Class III drugs work mainly by blocking K⁺ channels, and are used when other types of antiarrhythmics fail. These medications work to prevent arrhythmias and re-entrant arrhythmias by increasing myocyte action potential duration, effective refractory period and QT interval. A commonly used class III antiarrhythmic is amiodarone, which is considered a "dirty drug" due to its multisystemic toxicities, and prescribers should check pulmonary, liver, and thyroid function tests in patients taking this drug (causes pulmonary fibrosis, hepatotoxicity and hypo/hyperthyroidism). Other drugs in this class include ibutilide and dofetilide, which are helpful in restoring atrial fibrillation and flutter to normal sinus rhythm. Sotalol is a nonselective β-blocker which has class III antiarrhythmic properties, and use of this medication can cause excessive β-block in patients.



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Indications

Arrhythmias
Broken Arrhythmia-drum
Because of its side effect profile, these drugs are prescribed after other anti-arrhythmics fail, and are indicated to treat arrhythmias and prevent re-entrant arrhythmias.

Mechanism of Action

Increase AP Duration, ERP, and QT Interval
Up-arrow Action-clapper-P and Ear-P with Elongated QT-heart
These drugs increase AP (action potential) duration, ERP (effective refractory period), and QT interval. They do not slow conduciton velocity, but rather, they prolong repolarization in atrio-ventricular myocytes.

Drug Names

Amiodarone
Army-odor
Amiodarone increases refractoriness and has a long half-life. It is indicated for refractory life-threatening ventricular arrhythmias, and is the first line treatment for patients not responding to CPR. Amiodarone is unique, as it has class I, II, III, IV antiarrhythmic effects because it alters the lipid membrane.

Check Function Tests
Lung, Thyroid, and Liver with Test Tubes
When using amiodarone, doctors must check pulmonary, liver and thyroid function tests because of the documented toxicities of the drug. It is known to cause pulmonary fibrosis, hepatotoxicity and hypo/hyperthyroidism.

Dirty Drug
Dirty
Amiodarone is referred to as a "dirty drug" because it can bind to several different targets or receptors and thus have a wide range of effects. Side effects include cardiovascular effects (CHF, heart block, bradycardia), pulmonary fibrosis, hepatotoxicity, thyroid issues, corneal deposits, skin discoloration, neurological effects, and constipation.

Ibutilide
Eye-beetle
Ibutilide is indicated for quick conversion of atrial flutter or atrial fibrillation to a normal sinus rhythm. It is administered only through IV infusion and works by prolonging action potential duration. A side effect is torsades de pointes.

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Dofetilide

Dove-feet

Dofetilide is indicated for converting and maintaining normal sinus rhythm in the case of atrial flutter or atrial fibrillation.

Sotalol

Satellite-dish

Another class III antiarrhythmic is the non-selective competitive ?-adrenergic receptor blocker called Sotalol. It has significant side effects, including dyspnea, dizziness and torsades de pointes.

Beta-Blocker

Beta-fish with LOL-Blocks

Multiple class effects of this drug can cause excessive β-block on the heart. Sotalol is also a nonselective β-blocker.

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