Bile Acid Resins

Bile acid resins are a group of drug that prevent reabsorption of bile and lead to a decrease in cholesterol, specifically LDL. These drugs are indicated for treating hyperlipidemia (abnormally high values of lipids or lipoproteins in the blood), but have other uses as well. The mechanism of this drug is binding to bile acids and preventing their reabsorption in the gastrointestinal system, leaving them to be excreted. Circulating cholesterol is then utilized to replace the lost bile, decreasing blood levels of cholesterol. Commonly prescribed bile acid resins include colestipol, cholestyramine, which can be used for diarrhea treatment and toxin absorption, and colesevelam. Side effects of these drugs include patient complaints, due to the bad taste and GI disturbances that accompany their use. These medications lead to decreased absorption of fat-soluble vitamins and cholesterol gallstones as well.



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Indications

Hyperlipidemia
Hiker-lips
This drug is indicated for hyperlipidemia, which refers to abnormally high levels of lipids or lipoproteins in the blood. Bile acid resins are also indicated for familial hyperlipidemia type IIa, an inherited disease where patients display xanthelasmas (cholesterol deposit near the eyelids), arcus senilis (lipid deposits on the cornea), and tendon xanthomas.

Mechanism of Action

Bile Acid Reabsorption Prevented
Acidic-lemon Prevented before Sponge
This drug is a bile acid sequesterant, which binds to bile acids in the gastrointestinal tract. These form insoluble complexes which are excreted in the feces.

Decrease LDL
Down-arrow Ladybug-devil
As bile is sequestered and excreted, the liver has to use cholesterol to make more bile. Intracellular cholesterol depletion leads to upregulate expression of HMG-CoA reductase and LDL reductase. This results in increased uptake of LDL particles by hepatocytes and subsequent reduction in plasma LDL.

Drugs

Colestipol (Colestid)
Coal-stapler
Colestipol is a bile acid resin, which is commonly used. It has been known to bind to other medications and decrease their absorption/mechanism of action, such as digoxin, furosemide, and tetracycline.

Cholestyramine (Questran)
Coal-star-man
Cholestyramine is a commonly used bile acid resin, which is also used in other diseases. This drug can be used in Crohn's patients who have undergone ileal resection to prevent diarrhea. Furthermore, cholestyramine can be used to absorb toxins during a C. difficile infection.

Colesevelam (Welchol)
Coal-servant
Colesevelam is another commonly used bile acid resin, which also has been used to improve glycemic control in type 2 diabetics.

Side Effects

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GI Distress

GI with Flare-gun

These drugs tend to cause GI upset in many patients, which include symptoms such as constipation, bloating, indigestion, and nausea.

Cholesterol Gallstones

Cholesterol-burgers with Gold-stones

Very rarely, bile acid sequesterants can lead to cholesterol gallstones. This is because treatment yields higher cholesterol concentrations in the bile.

Decreased Absorption of Fat-soluble Vitamins

Down-arrow Bacon Viking-ship

Use of these medications lead to decreased absorption of fat-soluble vitamins: Vitamins A, D, E, and K.

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