Protease Inhibitors

Protease inhibitors are medications which inhibit the maturation of new viruses, by selectively binding to viral proteases and inhibiting replication. These are used in treating HIV/AIDS, as well as hepatitis C-related hepatitis. There are various side effects with this drug class, including nephropathy, lipodystrophy, hyperglycemia and GI distress.



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End in "-navir"
Navy-gear
These medications all share the suffix "-navir," with examples such as ritonavir and indinavir.

Indications

HIV/AIDS
Band-AIDS
Protease inhibitors are indicated for treating HIV and AIDS, as they inhibit HIV-1 protease.

Hepatitis C
Happy-tie Liver Cat
This drug class can be used to treat hepatitis, caused by hepatitis C virus.

Mechanism

Inhibit Protease
Propeller-ace with inhibiting-chains
These medications work by selectively inhibiting viral protease, which is an enzyme required for viral replication. Viral proteases cleave proteins. The inhibition of viral proteases prevents viral maturation by inhibiting the post-translational cleavage of viral polyproteins into functional viral proteins.

Unable to Cleave Proteins
Unable to Cleaver Protein
By inhibiting protease, the viral enzyme is unable to cleave viral polyproteins into functional viral proteins, inhibiting maturation of the virus into its more infectious form.

Inhibits Maturation of New Virus
Baby-virus with inhibiting-chains
Virus maturation occurs by assembling functional units, which are made from polypeptides that were cleaved by protease. By inhibiting viral protease, these functional protein precursors cannot be cleaved, and a new, mature, infectious virus cannot be assembled.

Side Effects

GI Distress
GI with Flare-gun
GI distress is a common side effect of these medications, and patients complain of intolerance, with features such as diarrhea and nausea.

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Nephropathy

Wavy-kidney

Protease inhibitors have been known to cause the side effect of nephropathy in patients. These manifest as proximal tubular injury and nephrolithiasis (kidney stones).

Lipodystrophy

Lip-disc-trophy

A side effect of protease inhibitor use is lipodystrophy, or abnormal degeneration of fat (adipose) tissue. This usually occurs in the face, and is commonly seen in HIV/AIDS patients taking drugs from this class.

Hyperglycemia

Hiker-glue-bottle

Hyperglycemia is a side effect associated with these medications, which can progress to type II diabetes mellitus. This is because use of these medications can lead to insulin resistance.

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