Foscarnet

Foscarnet is an antiviral medication used to treat CMV retinitis in immunocompromised that have failed ganciclovir therapy. It can also be used for acyclovir-resistant HSV. This drug works by inhibiting viral DNA polymerase and does not require activation by a viral kinase. Foscarnet use can lead to nephrotoxicity, and viruses can become resistant when they mutate their DNA polymerase.



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Indications

CMV Retinitis
Side-toe-mega-virus with Red-tin-eyes
Foscarnet is an antiviral medication used to treat CMV retinitis in immunocompromised patients. Most often, these patients have symptoms which have persisted beyond ganciclovir treatment.

Acyclovir-resistant HSV
Apple-cyclops Resisted By Herpes-harp
Foscarnet is also indicated for use in the treatment of acyclovir-resistant HSV.

Mechanism

Does Not Require Activation (by Viral Kinase)
Does not require activation-key
This medication does not require phosphorylation or activation by thymidine kinases.

Inhibits Viral DNA Polymerase
Inhibiting-chains on DNA Polly-mirror
This med works by inhibiting viral DNA polymerase by binding to the pyrophosphate-binding site of this enzyme. Thus, foscarnet inhibits elongation of viral DNA.

Pyrophosphate Analog
Pyro-phosphate-P On-a-Log
Foscarnet is a pyrophosphate analog, mimicking its structure. It works by binding to the pyrophosphate-binding site of viral DNA polymerase.

Resistance through Mutated DNA Polymerase
Resistant Mutant DNA Poly-mirror
Viruses can gain resistance to Foscarnet when they mutate their DNA polymerase enzyme. By mutating the enzyme, Foscarnet is no longer able to bind to it and inhibit its effects.

Side Effects

Nephrotoxicity
Kidney with Toxic-green-glow
This drug is known to cause nephrotoxicity, and leads to increased creatinine levels in patients. This side effect, however, is reversible with adequate hydration and decreased dosage.

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Electrolyte Abnormalities

Electric-lights Abnormal

Foscarnet can lead to electrolyte abnormalities, such as hypokalemia, hypocalcemia, and hypomagnesemia. These abnormalities can lead to mental status changes, paresthesias, irritability, hallucinations, or even seizures.

Hypokalemia

Hippo-banana

Hypokalemia is a potassium level less than 3.5 mEq/L. It is characterized by muscle weakness, arrhythmias, presence of U waves, constipation, and hyporeflexia.

Hypocalcemia

Hippo-calcified-cow

Foscarnet can cause hypocalcemia, and less frequently hypercalcemia. Decreased levels of calcium below 8.5 mg/dL are termed hypocalcemia. It is characterized with decreased bone density, muscle spasms, tetany, increased deep tendon reflexes, and a prolonged QT interval.

Hypomagnesemia

Hippo-magnesium-magazine

Hypomagnesemia is characterized by a serum magnesium level of less than 1.5 mEq/L. It is characterized by increased deep tendon reflexes, seizures, muscle cramps, tremors, insomnia, and tachycardia.

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