Linezolid (Zyvox)

This newer bacteriostatic antimicrobial agent is considered part of the oxazolidinone class. Through inhibition of the 50S subunit, Linezolid is able to combat gram-positive causes of pneumonia and skin infections, as well as MRSA and VRE. This antibiotic is comparatively expensive and sometimes hard to obtain. However, its use is often limited by its severe adverse effects, including bone marrow suppression and serotonin syndrome. Linezolid's efficacious use against drug-resistant organisms makes it an important antibiotic to know and remember.



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Mechanism Of Action

Oxazolidinone Antibiotic
Ox-soldier ABX-guy
Linezolid is a drug from the oxazolidinone family. This drug was the first of its class of antibiotics consisting of heterocyclic, nitrogen-containing, organic, 5-member ring compounds. Linezolid was first approved for use by the FDA in 2000.

Binds 23S rRNA of 50S Subunit
Binds (23)S Jersey with Rabbit-zombie and (50)S Cent Subunit
Linezolid, like many other antibiotics, has a mechanism of action based around the ribosomal subunit, particularly the 50S subunit, where it binds 23S rRNA to prevent the formation of a functional 70S subunit, which is a necessary component of translation.

Inhibits Protein Synthesis
Mr. Protein in Inhibiting-chains
Since this drug's mechanism blocks the creation of the required 70S subunit, translational production of peptide chains cannot take place; this leads to cell stagnation and death in some cases, though Linezolid is primarily bacteriostatic.

Indication

Gram-Positive Organisms
Graham-cracker Positive-angel
This medication is used to combat resistant gram-positive organisms, especially pneumonia and skin infections secondary to staphylococcus and streptococcus.

MRSA
MR. Saw
One of the major uses of linezolid in today's clinical setting is as an alternative to vancomycin in fighting MRSA infections, particularly in those who may not be suitable candidates for vancomycin use.

VRE (Vancomycin Resistant Enterococci)
Van-tank-mice Tied-up
VRE (Vancomycin Resistant Enterococci) are organisms that continue to be a concern due to their deleterious effects, broad drug resistance, and difficulty in being eradicated. It has been discovered that certain VRE strains are even now developing resistance to linezolid.

Side Effects

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Bone Marrow Suppression

Bone Marylin-Monroe Suppressed

This rare, severe adverse effect is thought to be duration-dependent (typically less than 2 weeks). Use extreme caution with patients who already have bone marrow suppression or chronic infections. It is recommended that the CBC is monitored weekly, and it should be discontinued in patients exhibiting evidence of myelosuppression.

Decreased Platelet Count

Down-arrow Plate Count

Thrombocytopenia is the most common blood dyscrasia caused by linezolid. Careful monitoring of platelet count and symptoms of bleeding, particularly in patients on antiplatelet therapy such as aspirin, is warranted.

Peripheral Neuropathy

Purple-wavy Neuron-extremities

Sensation changes, such as numbness, tingling, burning, and itching, can occur with Linezolid use. This drug is also associated with optic neuropathy, as well as diminishment or loss of proprioception, vibration, and/or temperature sensations.

Lactic Acidosis

Lake of Acidic-lemon

Linezolid is one of several medications known to cause lactic acidosis in certain patients. Prescribers should be mindful of this adverse effect in patients presenting with recurrent nausea and vomiting, decreased levels of bicarbonate, or in which an otherwise unexplained metabolic acidosis is seen.

Serotonin Syndrome

Silver-tonic Savage

Extreme caution should be exercised in patients who exhibit a constellation of multisystem excitation symptoms indicative of serotonin syndrome. These include confusion, agitation, hallucinations, seizures, hyperthermia, shivering, tachycardia, rhabdomyolysis, and possibly organ failure in the most severe cases. Patients on linezolid should not combine the drug with SSRIs (Selective Serotonin Reuptake Inhibitors), and they should wait 2 weeks after stopping an MAOI (monoamine oxidase inhibitor), as serotonin syndrome can occur.

Considerations & Patient Education

Avoid Tyramine Containing Foods

Avoid Tire-man and Food

Foods such as aged cheese, fava bean pods, soy sauce, soybean-based foods, cured or aged meat, sauerkraut, beer on tap, and Marmite yeast extract should be avoided in patients taking Linezolid, as they contain high amounts of tyramine. Additionally, food at risk for being spoiled, including meat, poultry, or fish, should all be avoided in patients currently taking Linezolid. Consumption of these foods can lead to tyramine excess, which may result in dangerous blood pressure changes and the associated symptoms of chest pain, tachycardia, confusion, headaches, nausea and vomiting, vision changes, epistaxis, and anxiety.

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