Linezolid

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Indications

MRSA and MRSE (with MIC > 1 mcg/ml) or patient with vancomycin allergy Linezolid 600mg IV or PO q 12 hrs

Linezolid is an antibiotic used for the treatment of serious infections caused by Gram-positive bacteria that are resistant to other antibiotics. Linezolid is active against most Gram-positive bacteria that cause disease, including streptococci, vancomycin-resistant enterococci (VRE), and methicillin-resistant Staphylococcus aureus (MRSA).

The main uses are infections of the skin and pneumonia although it may be use for a variety of other infections.

When administered for short periods, linezolid is a relatively safe antibiotic. It can be used in people of

all ages and in people with liver disease or poor kidney function. Common adverse effects of short-term use include headache, diarrhea, and nausea. Long-term use, however, has been associated with serious adverse effects such as bone marrow suppression and low platelet counts, particularly when used for more than two weeks. If used for longer periods still, it may cause sometimes irreversible chemotherapy-induced peripheral neuropathy and optic nerve damage, and lactic acidosis (a buildup of lactic acid in the body), all most likely due to mitochondrial toxicity.

As a protein synthesis inhibitor, it stops the growth of bacteria by disrupting their production of proteins, that is, it is a bacteriostatic agent, not bacteriocidal. Although many antibiotics work this way, the exact mechanism of action of linezolid appears to be unique in that it blocks the initiation of protein production, and not one of the later steps.

Bacterial resistance to linezolid has remained very low since it was first detected in 1999, although it may be increasing. It is a member of the oxazolidinone class of drugs.

Linezolid was discovered in the 1990s by a team at Pharmacia and Upjohn Company and first approved for use in 2000. It is on the World Health Organization's List of Essential Medicines, the most important medications needed in a basic health system.

Linezolid costs approximately US$100 per tablet in the United States. Nonetheless, it appears to be more cost-effective than generic alternatives such as vancomycin, mostly because of the possibility of switching from intravenous to oral administration as soon as patients are stable enough, without the need for dose adjustments.

In animal studies of meningitis caused by Streptococcus pneumoniae, linezolid was found to penetrate well into cerebrospinal fluid, but its effectiveness was inferior to that of other antibiotics.

There does not appear to be enough high-quality evidence to support the routine use of linezolid to treat bacterial meningitis. Nonetheless, it has been used successfully in many cases of central nervous system infection—including meningitis—caused by susceptible bacteria, and has also been suggested as a reasonable choice for this indication when treatment options are limited or when other antibiotics have failed.

The guidelines of the Infectious Diseases Society of America recommend linezolid as the first-line drug of choice for VRE meningitis, and as an alternative to vancomycin for MRSA meningitis.

Linezolid appears superior to vancomycin in treating community-acquired MRSA infections of the central nervous system, although very few cases of such infections have been published (as of 2009).

Linezolid in Neurosurgery

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