Tetracycline Drug Names and Indications

Tetracyclines are a group of broad-spectrum antibiotics, named after their structure, which contains a four hydrocarbon ring derivative. Drugs in this group include tetracycline, doxycycline, demeclocycline, and minocycline. Doxycycline is fecally eliminated and can, therefore, be used in patients with renal impairment. Demeclocycline is a specific tetracycline that is widely used in the treatment of hyponatremia caused by syndrome of inappropriate antidiuretic hormone (SIADH), when fluid restriction alone is not adequate. The use of demeclocycline in SIADH actually utilizes a side effect of the drug, which is an antidiuretic hormone antagonist. In individuals without SIADH, it can induce nephrogenic diabetes insipidus.These antibiotics are protein synthesis inhibitors that bind to the 30S prokaryotic ribosomal subunit in the mRNA-translation complex. By doing so, these drugs prevent the binding aminoacyl tRNA to the mRNA-ribosome complex. Because these drugs are relatively water-soluble, they demonstrate limited CNS penetration. In addition, orally administered tetracyclines may chelate divalent cations like Ca2+, Mg2+, and Fe2+, and impair absorption. Therefore, oral administration of these drugs should be separated from the consumption of foods or supplements with high amounts of divalent cations like milk, antacids, or iron by at least one or two hours. Tetracyclines remain the treatment of choice for infections caused by chlamydia, rickettsia, and spirochetal infections like Borrelia burgdorferi. They are also sometimes used in the triple-therapy regimen for Helicobacter pylori, as well as in the treatment of Mycoplasma pneumonia.Side effects of tetracyclines are not common, but an important one to note is photosensitivity. Tetracyclines can increase the risk of sunburn under exposure to sunlight. These drugs may also cause GI distress. Tetracyclines are also considered teratogens due to the strong association with teeth discoloration in the fetus, and as the teeth develop in infancy. These drugs are also associated with the inhibition of bone growth in children when given at therapeutically high doses. Therefore, these drugs should not be administered to children under the age of eight.

PLAY PICMONIC

Drug Names

Demeclocycline
Democratic-donkey-cycling
Demeclocycline is a drug within the tetracycline family, and is widely used in the treatment of hyponatremia caused by syndrome of inappropriate antidiuretic hormone (SIADH). This drug is administered when fluid restriction alone is not adequate. The use of demeclocycline in SIADH actually utilizes a side effect of the drug, which is an antidiuretic hormone antagonist. In individuals without SIADH, demeclocycline can induce nephrogenic diabetes insipidus.

Minocycline
Miner-cycling
Minocycline is a tetracycline antibiotic which has a slightly broader spectrum than the other members of the group. This antibiotic is classified as a long-acting antibiotic, and has a half-life approximately two to four times that of other simple water-soluble tetracyclines. It is also is the most lipid-soluble, giving it the highest penetration into the brain and prostate. However, as a result, it is also associated with the greatest amount of CNS side effects, like vertigo.

Doxycycline
Dachshund-cycling
Doxycycline is a tetracycline antibiotic that has a similar spectrum of coverage as other tetracyclines. It is commonly used in prophylaxis against malaria. Importantly, doxycycline is unique from other drugs in this class because it is fecally eliminated and can therefore be used in patients with renal failure.

Fecally Eliminated
Dachshund Defecating
Doxycycline is unique from other drugs in this class because it is fecally eliminated. Thus, it can be used in patients with renal failure.

Can be Used in Renal Failure
Dead Kidney
Doxycycline is unique from other drugs in this class because it is fecally eliminated and can therefore be used in patients with renal failure.

Indications

Antidiuretic Hormone Antagonist

Anti-die-rocket Harmonica Ant-toga

Demeclocycline is a semisynthetic, specific tetracycline that is widely used in the treatment of hyponatremia caused by syndrome of inappropriate antidiuretic hormone (SIADH), when fluid restriction alone is not adequate. The use of demeclocycline in SIADH actually utilizes a side effect of the drug, which is an antidiuretic hormone antagonist. In individuals without SIADH, it can induce nephrogenic diabetes insipidus.

Chlamydia

Chlamydia-clam

Chlamydia trachomatis is an obligate intracellular human pathogen. It is well known for its ability to cause human disease, including granular conjunctivitis, urethritis, and lymphogranuloma venereum. This organism is sensitive to tetracyclines, and this drug class can also be used to treat infections caused by Chlamydia pneumoniae and Chlamydia psittaci.

Rickettsia

Racket

Rickettsial diseases are caused by a variety of obligate intracellular, gram-negative bacteria from the genera Rickettsia, Orienta, Ehrlichia, and Coxiella. Rickettsial infections that cause diseases in humans include Rocky Mountain spotted fever, typhus, Ehrlichiosis and Q fever. Tetracycline antibiotics are typically contraindicated in children, but an exception to this rule is when a child is suspected of having Rocky Mountain Spotted Fever. If there is a high clinical suspicion of Rickettsial infection in a patient, a tetracycline antibiotic should be started immediately.

Borrelia burgdorferi

Barrel Burglar-fairy

Borrelia burgdorferi is a spirochete bacteria, which characteristically causes the symptoms of lyme disease. This bacteria is transmitted through the ixodes tick as a vector, which is required for its lifecycle. The classic presentation of lyme disease, or Borrelia burgdorferi infection after a tick bite, is an initial bulls-eye rash with central clearing. This rash is referred to as erythema migrans. After several weeks, the patient can experience a variety of neurologic or cardiac symptoms, including Bell's palsy and heart block.

Helicobacter Pylori

Helicopter

Helicobacter pylori is a curved, gram-negative bacteria, which is flagellated. It is found in the upper gastrointestinal tract of over 50% of the world's population. H. pylori is the causative culprit of peptic ulcer disease and chronic gastritis. Tetracycline can be used as part of the “quadruple-therapy” regimen for treating H. pylori infections.

Mycoplasma Pneumonia

Mic Nude-Mona

Mycoplasma pneumoniae is the organism that causes Mycoplasma pneumonia, also called walking pneumonia. The term “walking pneumonia” is used because X-ray findings often show a pulmonary infection before physical signs of atypical pneumonia are observable at all; thus, it is an occult pneumonia. This variety of pneumonia is an atypical pneumonia, and is spread through respiratory droplet transmission. It is called an atypical pneumonia because there is a protracted course, lack of sputum production, and extra-pulmonary symptoms as compared to typical pneumonia.