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The Review on Azithromycin

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ABSTRACT:

Azithromycin is a broad-spectrum macrolide antibiotic with a long half-life and excellent tissue penetration. Azithromycin is an in vitro active azalide antibiotic and the major pathogenis believed to cause respiratory, skin and soft tissue infections in children. In children, azithromycin is usually given on day 1 at 10 mg/kg/day for 3 days, followed by 5 mg/kg/day for 4 additional days. Azithromycin is a subclass of microlide antibiotics. It is derived from erythromycin with a methyl--substituted nitrogen atom incorporated into the lactone ring, making the lactone ring 15-membered. Pathogens commonly susceptible to azithromycin include Haemophilus influenzae (includingampicillin-resistant strains), Moraxella catarrhalis, Streptococcus pneumoniae, Chlamydiatrachomatis, Mycoplasma pneumoniae, Streptococcus pyogenes, and Streptococcus agalactiae. Azithromycin is administered once daily, reaches clinically relevant concentrations at the site of infection, is slowly cleared from the body, and has few drug-drug interactions. A 5-day regimen (500 mg on day 1 and 250 mg on days 2-5) or a 3-day regimen (500 mg daily for 3 days).

Keywords: Azithromycin, Chalmydia Pneumoniae, Haemophillus, Interaction, Atoms

INTRODUCTION:

Azithromycin is an azalide, type of macrolide antibiotic.it works by decreasing the production of protein, thereby stopping bacterial growth. Azithromycin was discovered in 1980 by the Yugoslavpharmaceutical company Piliva and approved for medical use under the brand name Sumamed in1988.[1]The World Health Organization classifies it as critical important for human medicine.It is avalible as ageneric medication and is sold under many trade names worldwide.In 2020,it was the 68th mostcommonly prescribed medication in the Uniteed states with more than 10 million prescription.[2]Azithromycin is a broad- spectrum macrolide antibiotic with bacterostatic activity against many Grampositive and Gram-negative bacteria including Bordetlla pertusis and Legionella species. Azithromycinis an antibiotic medication used for the treatment of number of bacterial infection .[3] This includesmiddle ear infection,throat infection,pneumonia,traveller,s dairrhea and certain other intestinalinfection.sexully tansmiteed disease (STD) and infection of reproductive organ.[4] Azithromycin alsoused to treat or prevent disseminaded Mycobacterium avivum complex (MAC) infection. A type of lunginfection that often affects people with Human immunodeficiency virus (HIV).[5]Azithromycin and levofloxacin have been shown to be efficacious in treating infections. The adversedrug events associated with azithromycin and levofloxacin were considered rare.[6] However, the USFDA released warnings regarding the possible risk of QT prolongation with azithromycin andlevofloxacin Pharyngitis or tonsillitis in children, but recurrence of infection appears to be more frequent in this indication than withphenoxymethylpenicillin, requiring a dose of 12 mg/kg/day for 5 days. Community-acquired pneumonia, bronchitis and other respiratory infections inchildren responded to both azithromycin and amoxicillin/

clavulanic acid,cefaclor, erythromycin, or josamycin. Azithromycin was as good as or better than ceftibutene in a mixed population of general medical

patients. However, his symptoms of lower respiratory tract infections resolved faster with azithromycin than his with erythromycin, josamycin, or

cefaclor. [8]

PHARMACOLOGY :

BrandNames:

Azasite, Zithromax, Zmax, Zithromax Tri-Pak.

Type:

Small Molecule

Groups:

Approved

Weight :

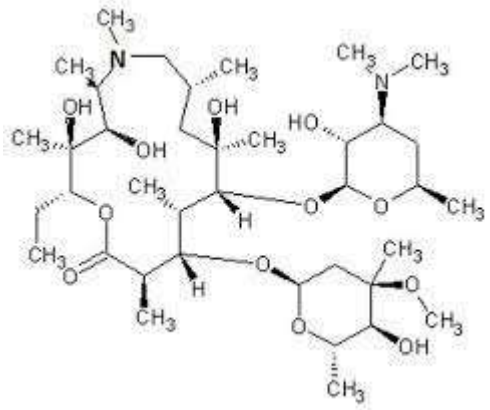
Average: 748.9845

Monoisotopic: 748.508525778

ChemicalFormula:

C38H72N2O12

STRUCTURE:



PHARMACOKINETIC:

Absorbtion :

Because azithromycin is an acid-stable antibiotic, it can be taken orally without the need for gastric acid protection. It is easily absorbed, but the rate of absorption is higher on an empty stomach. The time to reach maximum concentration (Tmax) in adults is 2.1-3.2 hours for him in oral dosage form. The bioavilabilitty of azithromycin is approximately 37% . Single oral 500 mg dose peak plasma concentration of about 0.35-0.45 mg/are attained within approximately 2 hours.[10]

Distribution :

After oral administration, azithromycin is widely distributed in tissues with an apparent steady-state volume of distribution of ±31.1 L/kg. Due to its high concentration in scavenger cells, azithromycin is actively transported to the site of infection. High concentrations are released during active phagocytosis. Concentrations of azithromycin in tissue can be more than 50-fold higher than in plasma due to removal of the ion and its high lipid solubility. [citation needed] Due to the half-life of azithromycin, a single dose of large doses ofcan maintain bacteriostatic levels in infected tissues for several days [12]. Drug is concentrated in macrophages and polymorphonuclear cells and is effective against Chlamydia trachomatis.

Protein binding :

The protein binding of azithromycin declined from about 50% at 0.02 mg/l to 12% at 0.5mg/l[14]

Route Of Elimination :

Azithromycin is mainly eliminated unchaged in the feaces its bilary excreation and transintestinal secretion over 1 week period Approximately 6% of the administered dose is found as unchanged drug in urine.[15] Clearance of azithromycin mean apparent plasma cl = 630 ml/min[16]

Mechanism of action :

Macrolysis inhibits bacterial protein synthesis. The macrolide's mechanism of action revolves around its ability to bind to her 50S ribosomal subunit of bacteria, thereby halting the synthesis of bacterial protein. It halts bacterial protein synthesis by inhibiting the transpeptidation/translocation step ofprotein synthesis and the assembly of the 50S ribosomal subunit.[18]

PHARMACODYNAMICS :

By inhibiting protein synthesis and translation, macrolides stop bacterial growth and treat bacterial infections. Influenza resistance mechanisms to macrolides include alterations in ribosomal methylases, intrinsic or acquired efflux pumps, and ribosomal proteins or RNA.

ADMINISTRATION :

Azithromycin is available in both oral and parenteral dosage forms. The usual dose of azithromycin is 250 mg or 500 mg once daily for 3 to 5 days, with higher doses prescribed for acute infections.
Oral Formulation: Is include tablets 250mg and 500mg, packets (1 gram powder is dissolved in 60ml of water. Dosing can be administered with or without food.[22]

Intravenous (IV): Is available in a 500 mg preservative free solution for reconstitution. Azithromycin is administration should not be via intramuscular injection or iv bolus [23]

Opthalmic Solution: 1% available in 2.5 ml bottle which is used in bacterial pinkeye.[24]

Suspenstion: Suspension is mostly prescribed to children.

What Conditions does Azithromycin Treat?

 Prevention of Mycobacterium avium complex disease

 Traveler's diarrhea

 Mycoplasma hominis infection of the female pelvic organs

 Skin infection due to Staphylococcus aureus bacteria

 Skin infection due to Streptococcus pyogenes bacteria

 Skin infection due to Streptococcus agalactiae bacteria.[25]

 whooping cough

 Strep throat

 Strep throat and tonsillitis

 Treatment to prevent traveler's diarrhea

 Acute gonorrhea of the urethra

 Acute gonorrhea of the cervix

 Severe episode of chronic bronchitis by M. catarrhal is

 Severe episode of chronic bronchitis due to Streptococcus pneumonia

 Chancroid

 Infection of the urethra caused by Chlamydia trachomatis

 Bacterial infection of cervix due to Chlamydia trachomatis

 AIDS with toxoplasmosis

 Lyme disease

 Infection of the middle ear by H. influenzae bacteria

 Mycobacterium avium bacteria infection

 Middle ear infection caused by Moraxella catarrhalis

 Infection of the middle ear by S. pneumoniae bacteria

 A bacterial infection of the middle ear

 Treatment to prevent bacterial infection of a heart valve

 Acute sinusitis caused by Streptococcus pneumoniae

 Acute sinusitis caused by Haemophilus influenzae

 Acute sinusitis caused by Moraxella catarrhalis

 Bacterial pneumonia caused by Streptococcus pneumoniae

 Bacterial pneumonia caused by Haemophilus influenzae

 Bacterial infection with chronic bronchitis

 Pneumonia caused by Legionella pneumophila bacteria

 Pneumonia caused by the bacteria Moraxella catarrhalis

 Severe episode of chronic bronchitis due to H. flu

SIDE EFFECTS :

 Nausia

 Headache

 Gastrointestinal Upset

 Dizziness

 Changes to your sense of taste

 Feeling dizzy or tired

 Itching, swelling

Serious side effects

 Arrhythmia

 The whites of your eyes turn yellow or skin turns yellow

 You have pale poo with dark pee- these can be signs of liver or gallbladder problems

 Tinnitus (you get ringing your ears).

 Vertigo (Temporary hearing loss, or you feel unsteady on your feet.

 You have severe pain in your stomach or back –this can be sign of inflammations of the pancreas (pancreatitis)

 You have diarrhea (perhaps with muscle cramps) that contains blood or mucus.[26]

 Losing Your appetite.

CONCLUSION:

Azithromycin tablets are the safest antibiotics, are well tolerated and have special pharmacokinetic properties. In addition, it has broad antibacterial properties. It is an effective treatment for all types of infections.The drug was administered slowly at high doses to reduce gastrointestinal side effects.

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