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**16/MHS06/066 (C.O)**

**400LEVEL**

**ASSIGNMENT**

Antibiotics can inhibit protein synthesis by targeting either the 30S subunit, examples of which include spectinomycin, tetracycline, and the aminoglycosides kanamycin and streptomycin, or to the 50S subunit, examples of which include clindamycin, chloramphenicol, linezolid, and the macrolides erythromycin etc.

**Clindamycin:**

Clindamycin is an antibiotic used for the treatment of a number of bacterial infections, including bone or joint infections, pelvic inflammatory disease, strep throat, pneumonia, middle ear infections, and endocarditis. It can also be used to treat acne, and some cases of methicillin-resistant Staphylococcus aureus. It targets the 50S subunit.

Mechanism of action:

Clindamycin prevents peptide bond formation, thereby inhibiting protein synthesis by reversibly binding to 50S ribosomal subunits. Depending on the organism, infection site, and drug concentration, clindamycin may be a bacteriostatic or bactericidal antibiotic. When taken orally, absorption cannot take place until clindamycin palmitate becomes hydrolyzed in the gastrointestinal (GI) tract. It then distributes across the body in tissue and other regions containing blood. Clindamycin cannot efficiently penetrate meninges very well and is therefore not an antibiotic of choice for infections of the cerebrospinal fluid (CSF). As it travels through the bloodstream, clindamycin is primarily bound to protein. Clindamycin is primarily metabolized in the liver by CYP 3A4 (major) and CYP 3A5, which oxidize the antibiotic into clindamycin sulfoxide (primary metabolite) and N-desmethyl clindamycin respectively. When administered orally, the antibiotic peaks within 60 minutes. When given intramuscularly (IM), the drug achieves peak concentrations in 1 to 3 hours. The half-life of clindamycin is approximately 3 hours in adults and approximately 2.5 hours in children, at which point it is excreted in the urine (major) and feces (minor) as active and inactive metabolites.

Indication of use:

Clindamycin is used primarily to treat anaerobic infections caused by susceptible anaerobic bacteria, including dental infections, and infections of the respiratory tract, skin, and soft tissue, and peritonitis. In people with hypersensitivity to penicillins, clindamycin may be used to treat infections caused by susceptible aerobic bacteria, as well. It is also used to treat bone and joint infections, particularly those caused by Staphylococcus aureus. Topical application of clindamycin phosphate can be used to treat mild to moderate acne.

Toxicity:

The most common adverse effects that occur with clindamycin toxicity are GI or allergic. There is no antidote for clindamycin toxicity, and the adverse effects will resolve with dose adjustment or discontinuation of the antibiotic. The treatment is supportive. The recommendation is to measure serum electrolytes in patients with vomiting and/or diarrhea. Vital signs need to be monitored along with CBC with differential, platelets, LFTs, and renal function in patients who are symptomatic. It is also essential to get an ECG and maintain continuous cardiac monitoring as cardiac arrhythmias, although rare, may occur. Evaluation for C. defficile toxin will be needed when colitis is suspected. It is important to look out for severe allergic reactions like DRESS or Steven-Johnson syndrome.  In these situations, immediate discontinuation of the antibiotic is imperative along with supportive management that includes: IV fluids, oxygen therapy, diphenhydramine, and corticosteroids. In cases of severe hypotension, it may be necessary to administer fluid boluses and start vasopressors. Airway management is likely not needed, but severe anaphylactic reactions will require airway management with endotracheal intubation. Rarely clindamycin toxicity will lead to cardiac arrhythmias and cardiac arrest, in which case advanced cardiovascular life support will be required.

Adverse effects:

1. Any change in bowel habits
2. Severe stomach pain, diarrhea that is watery or bloody
3. Little or no urination
4. A metallic taste in your mouth (after clindamycin injection).

Common clindamycin side effects may include:

1. Nausea
2. Vomiting
3. stomach pain
4. mild skin rash
5. vaginal itching or discharge