Muse Mistura Omolola

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PHA302(Pharmacology)

**Clindamycin (lincosamides)**

Clindamycin is a class of lincosamides, that is better absorbed after oral administration and is more active against the organisms within its spectrum. These include staphylococci, streptococci and most anaerobic bacteria, against which clindamycin exhibits outstanding activity. Enthusiasm for the use of clindamycin has been tempered by an association with the occasional development of severe diarrhoea, which sometimes progresses to a life-threatening pseudomembranous colitis.

**Mechanism of Action**

Lincosamides prevent bacterial replication in a bacteriostatic mechanism by interfering with the synthesis of proteins.

In a mechanism similar to macrolides and streptogramin B, lincosamides bind close to the peptidyl transferase centre on the 23S portion of the 50S subunit of bacterial ribosomes. High resolution X-ray structures of clindamycin and ribosomal subunits from bacterium have showed exclusive binding to the 23s segment of the peptidyl transferase cavity. Binding is mediated by the mycarose sugar moiety which has partially overlapping substrates with peptidyl transferase. By extending to the peptidyl transferase centre, lincosamides cause the premature dissociation of peptidyl-tRNA's containing two, three or four amino acid residues. In this case, peptides will grow to a certain point until steric hindrance inhibits peptidyl transferase activity. Lincosamides do not interfere with protein synthesis in human cells (or those of other eukaryotes) due to structural differences between prokaryotic and eukaryotic ribosomes. Lincosamides are used against gram positive bacteria since they are unable to pass through the porins of gram negative bacteria.

**Indication for Use**

Lincosamides are often used clinically as an alternative antibiotic for patients who are allergic to penicillin. In the lincosamides, clindamycin is most commonly used within the clinic due to its higher bioavailability, higher oral absorption and efficacy within the target organism spectrum. Lincosamides are generally the first-choice use antibiotic class in veterinary microbiology, most commonly used to combat skin infections.

Other clinical uses for lincosamide antibiotics in humans are numerous. They are efficacious in the treatment of

Denntal infections

Abdominal infections

Abscesses

Pelvic inflammatory disease and

Anaerobic infections.

Clindamycin alone has been shown to be efficacious in the treatment of acne, malaria and toxic shock syndrome and to decrease the risk of premature births in women with bacterial vaginosis.

**Toxicity and Adverse Effect**

There have been no records of severe organ toxicity. In few cases gastrointestinal disturbances have been associated with it’s administration. Pseudomembranous enterocolitis resulting from clindamycin-induced disruption of gastrointestinal flora can be a lethal adverse event observed in several species when used in the veterinary clinic, particularly in horses. At extremely high doses of clindamycin, skeletal muscle paralysis has been demonstrated in several species.

Other effects include; diarrhoea, nausea, vomiting, abdominal pain and rash.