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COURSE CODE: PHA 302

COURSE TITLE: INTRODUCTORY PHARMACOLOGY AND TOXICOLOGY

WRITE ON A NAMED BACTERIAL PROTEIN SYNTHESIS INHIBITOR, STATING ITS MECHANISM OF ACTION, INDICATION FOR USE, TOXICITY AND ADVERSE EFFECTS.

A protein synthesis inhibitor is a substance that stops or slows the growth or proliferation of cells by disrupting the processes that lead directly to the generation of new proteins. It usually refers to substances such as antimicrobial drugs that act at the ribosome level.

AMINOGLYCOSIDE ANTIBIOTICS

The aminoglycosides primarily act by binding to the aminoacly site of 16s ribosomal RNA within the 30s ribosomal subunit, leading to a misreading of the genetic code and inhibition of translocation. The initial steps required for peptide synthesis, such as binding of mRNA and the association of the 5os ribosomal subunit, are uninterrupted, but elongation fails to occur due to disruption of mechanisms for ensuring translational accuracy. The ensuing antimicrobial activity is usually bactericidal against susceptible aerobic gram-negative bacilli.

 Aminoglycosides initially penetrate the organisms by disrupting the magnesium and calcium bridges between lipopolysaccharide moieties. They are transported across the cytoplasmic membrane in an energy-dependent manner. This step can be inhibited by divalent cations, increased osmolality, acidic pH an anaerobic environment.

INDICATION AND USAGE

1. Chronic hepatic insufficiency
2. Hepatic encephalopathy
3. Surgical prophylaxis

TOXICITY

Aminoglycosides should be relied upon as monotherapy in infectious that involves the lungs, abscesses and the central nervous system because of the poor activity and penetration into these sites.