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**MATRIC NO:** 18/MHS06/065

Write on a named bacterial protein synthesis inhibitor stating its mechanism of action , indication for use ,toxicity and adverse effects.

**AMINOGLYCOSIDES**

The aminoglycoside are a group of antibiotics of complex chemical structure, resembling each other in antimicrobial activity, pharmacokinetic characteristics and toxicity. The main agents are gentamicin, streptomycin, amikacin, tobramycin and neomycin .Aminoglycosides are a class of antibiotics used to treat serious infections caused by bacteria that either multiply very quickly or are difficult to treat.

**Mechanism of action**

Aminoglycosides inhibit bacterial protein synthesis by blocking initiation. Their penetration through the cell membrane of the bacterium depends partly on oxygen –dependent active transport by a polyamine carrier system, and they have minimal action against anaerobic organism. Chloramphenicol blocks this transport system.

The effect of the aminoglycosides is bactericidal and it enhanced by agents that interfere with cell wall synthesis.

**Indication for use**

Aminoglycosides are useful in infections involving aerobic, Gram-negative bacteria, such as Pseudomonas, Acinetobacter, and Enterobacter. The most frequent use of aminoglycosides is empiric therapy for serious infections such as sepsis, complicated intra-abdominal infections, complicated urinary tract infections, and nosocomial respiratory tract infections. Infections caused by Gram-positive bacteria can also be treated with aminoglycosides, but other types of antibiotics are more potent and less damaging to the host.

Since they are not absorbed from the gut, they are administered intravenously and intramuscularly. Some are used in topical preparations for wounds. Oral administration can be used for gut decontamination (e.g., in hepatic encephalopathy). Tobramycin may be administered in a nebulized form.

**Adverse effects and toxicity**

Aminoglycoside can cause

1. **inner ear toxicity** which can result in sensor neural hearing loss. The incidence of inner ear toxicity varies from 7 to 90%, depending on the types of antibiotics used, susceptibility of the patient to such antibiotics, and the duration of antibiotic administration.
2. **vestibular ototoxicity** This leads to oscillopsia (gaze instability) and balance impairments that impact all aspects of an individual's antigravity function. This loss is permanent and can happen at any dose.