Polypeptide antibiotic

- POLYMYXIN
- BACITRACINE
- TYROTHRICIN
- VANCOMYCINE

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Polymyxin

- Source- *Bacillus polymyxa*
- These are cyclic polypeptide classified ABCDE&M

MECHANISM OF ACTION-:these are cationic surface active agent

- It interact with negatively charged phospholipids in bacterial cell membrane increase permeability of cell membrane and disrupt it leading to cell lysis
- It also inactivate endotoxins

Antibacterial spectrum

- Its action against gram negative bacteria e.g.. *E-coli*, *Salmonella* , *Pseudomonas* except *Proteus*
- Gram positive bacteria is less sensitive

Resistance

- Through reduce permeability
- Cross resistance between polymyxin B& D

Pharmacokinetics

- They are neither absorbed topically nor orally and do not penetrate BBB
- Systemic effect by parental administration
- Excreted in urine

Contraindication

- Renal disease patients

Drug interaction

- Synergistic effect with sulphonamide,trimethopri(enterobector)
- polymyxine+amphoteresin B(antifungal)

Toxicity

- Nephrotoxic
- Neurotoxin and neuromuscular blocked at high concentration

Uses

- Orally used in life threatening infection caused by gram negative bacilli or pseudomonas
- Tropically in eye, ear and skin infection and bovine mastitis

Bacitracin

- It is polypeptide antibiotic obtained from *Bacillus subtilis*
- It is narrow spectrum similar to penicillin G
- It consist of 5 to 10 separate chemical component

Mechanism of action :-It inhibit the formation of bacterial cell wall peptidoglycan

- It block lipid carrier
- It inhibit dephosphorylation reaction
- It increase influx of ions

Antimicrobial spectrum

- Active again gram positive ,*cocci* and *bacillus clostridium* and *spirochetes*
- Resistant against gram negative
- **Pharmacokinetics**
- Orally not absorbed from GIT
- It not used parenterally
- **clinical use**
- Inflammation
- Zinc enhance effect of bacitracin
- Topically used for eye,ear and skin infection with polymyxine or neomycine
- Clostridium induced enteritis

Tyrothricin

- It is a mixture of gramocidin and edtyrocidine
- Obtained from *Bacillus brevis*

Mechanism of action:-it act on the cell membrane and cause leakage of cell contents ,also uncouple oxidative phosphorylation

Pharmacokinetics :-drug is not absorbed orally and is too toxic for systemic use.

Cause haemolysis

Clinical use

- bovine mastitis
- Metritis
- Topically for skin and ear infection

Vancomycin

- It is a glycopeptide antibiotic
- source –*Streptomyces orientalis*

Mechanism of action:-It inhibite the synthesis of peptidoglycan

- It bin to the terminal diapeptide sequence of peptioglycane unit and prevent release of lipid carrier

Antimicrobial spectrum:-active against metheciline

resistant against *Staphylococcus*,*Streptococcus* and *Clostridium*

pharmacokinetics

- Absorbed from GIT

Clinical use

- Use in infection of soft and bony tissue in dog and cat
- Antibiotic induce enterocolitis caused by *clostridium defficile*
- Topically in skin infection with polymyxin

Toxicity

- Hypersenstivity
- Ototoxicity
- nephrotoxicity