17/mhs06/019

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Bacteria protein synthesis inhibitor represent another major group of clinically useful antibacterial , such as erythromycin, tetracycline, chloramphenicol, and aminoglycosides. They selectively interact with the 70S bacterial ribosome and spare the 80S eukaryotic ribosome particle.

Chloramphenicol is a bacteriostatic broad spectrum antibiotic that is effective against a variety of susceptible and serious bacterial infections but is not frequently used because of its high risk of bone marrow toxicity.it is active also against rickettsiae. Haemophilus influenzae ,N. meningitidis , and some strains of Bacteroides are highly susceptible , and for them chloramphenicol may be bactericidal.

Mechanism of action of chloramphenicol

Chloramphenicol inhibits protein synthesis in bacteria and, to a lesser extent , in eukaryotic cells. The drug readily penetrates bacterial cells, probably by facilitated diffusion. It acts primarily by binding reversibly to the 50S ribosomal subunit. Although binding of tRNA at the codon recognition site on the 30S ribosomal subunit is thus undisturbed , the drug appears to prevent the binding of the amino-acid containing end of the aminoacyl tRNA to the acceptor site on the 50S ribosomal subunit .The interaction between peptidyltransferase and its amino acid substrate cannot occur, and peptide bond formation is inhibited.

Pharmacokinetics of chloramphenicol

Following oral administration, chloramphenicol is rapidly and completely absorbed. It is widely distributed to virtually all tissues and body fluids. The drug penetrates cell membranes readily. Excretion of active chloramphenicol and of inactive degradation products occurs by way of the urine.

Clinical uses of chloramphenicol

Because of potential toxicity, bacterial resistance and the availability of other effective drugs, chloramphenicol may be considered mainly for treatment of serious rickettsial infections, bacterial meningitis caused by a markedly penicillin- resistant strain of pneumococcus or meningococcus, and typhoid fever.

Adverse reaction of chloramphenicol

- Gastrointestinal disturbances: Adults occasionally develop nausea, vomiting and diarrhea.
- Oral or vaginal candidiasis may occur as a result of alteration of normal microbial flora.
- Bone marrow disturbances or depression: chloramphenicol commonly causes a dose-related reversible suppression of red cell production at dosage exceeding 50mg/kg/d.
- Serious and fatal blood blood dyscrasias (aplastic anemia, hypoplastic anemia, thrombocytopenia, and granulocytopenia) are known to occur after administration of chloramphenicol

Toxicity for new born infants

Newborn infants lack an effective glucuronic acid conjugation. Mechanism for the degradation and detoxification of chloramphenicol. Consequently, when infants are given dosages above 50mg/kg/d, the drug may accumulate resulting in the gray baby syndrome, with vomiting, flaccidity, hypothermia, gray color, shock, and collapse.