

Name: Noel Martins O

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Pharmacology

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

Answer

A bacterial protein synthesis inhibitor is Chloramphenicol

CHLORAMPHENICOL

Chloramphenicol is an antibiotic useful for the treatment of a number of bacterial infections. This includes use as an eye ointment to treat conjunctivitis. By mouth or by injection into a vein, it is used to treat meningitis, plague, cholera, and typhoid fever.

Formula: $C_{11}H_{12}Cl_2N_2O_5$

Mechanism of Action

Chloramphenicol is a bacteriostatic by inhibiting protein synthesis. It prevents protein chain elongation by inhibiting the peptidyl transferase activity of the bacterial ribosome. It specifically binds to A2451 and A2452 residues in the 23S rRNA of the 50S ribosomal subunit, preventing peptide bond formation.

Indications for use

This medication is used to treat bacterial eye infections. Chloramphenicol is an antibiotic that works by stopping the growth of bacteria. This medication treats only bacterial eye infections. It will not work for other types of eye infections. Unnecessary use or misuse of any antibiotic can lead to its decreased effectiveness.

Toxicity

Despite being highly effective, it shows severe toxicity in the form of Aplastic anemia (AA) and bone marrow suppression. Its D – form is the toxic one and inhibits protein synthesis. In living system, CAP is hydrolyzed and absorbed completely. Its excretion is also at a high rate but is highly impaired in disorders associate liver and kidneys.

Chloramphenicol may cause bone marrow suppression during treatment; this is a direct toxic effect of the drug on human mitochondria. This effect manifests first as a fall in hemoglobin levels, which occurs quite predictably once a cumulative dose of 20 g has been given.

Adverse Effect

Along with its needed effects, chloramphenicol may cause some unwanted effects. Although not all of these side effects may occur, if they do occur they may need medical attention.

Rare:

- in babies only

Bloated stomach

drowsiness

gray skin color

low body temperature

uneven breathing

unresponsiveness

Less common:

Pale skin

sore throat and fever

unusual bleeding or bruising

unusual tiredness or weakness (the above side effects may also occur up to weeks or months after you Stop taking chloramphenicol)