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NURSING SCIENCE

SYSTEMIC PHARMACOLOGY IN NURSING PRACTICE

PHA 324

ANSWERS

1. 4-AMINOQUINOLINES: CHLOROQUINE

AMODIAQUINE

PIPERAQUINE

1. QUINOLINE-METHANOL:MEFLOQUINE
2. CINCHONA ALKALOID: QUININE

QUINIDINE

1. BIGUANIDES:PROGUANIL

CHOLRPROGUANIL

1. DIAMINOPYRIMIDINE:PYRIMETHAMINE
2. 8-AMINOQUINOLINE:PRIMAQUINE

TAFENOQUINE

1. SULFONAMIDE AND SULFONE:SULFADOXINE

DAPSONE

SULFAMETHOPYRAZINE

1. ANTIBIOTICS: TETRACYCLINE

DOXYCYCLINE

CLINDAMYCIN

1. SESQUITERPINE LACTONE:ARTESUNNATE

ARTHEMETER

ARTEETER

ARTEROLANE

1. AMINO ALCOHOLS:HALOFANTRINE

LUMEFANTRINE

1. NAPHTHYRIDINE:PYRONARINDINE
2. NAPHTHOQUINONE:ATOVAQUONE

4-AMINOQUINOLINES

The mechanism of action of 4-aminoquinolines is characterized by the concentration of the drug in the digestive vacuole of the intra erythrocytic parasite. Various hypotheses have been advanced to explain the specificity of action on the parasite; the most recent one is the inhibition of the haem polymerase of the parasite, leading to the accumulation of soluble haem toxic for the parasite. Chloroquine-resistant parasites accumulate the drug to a lesser extent than do sensitive parasites.

QUINOLINE METHANOL

The molecular basis of the action of these drugs is not completely understood, but they are thought to interfere with hemoglobin digestion in the blood stages of the malaria parasite's life cycle. The parasite degrades hemoglobin, in an acidic food vacuole, producing free heme and reactive oxygen species as toxic by-products. The heme moieties are neutralized by polymerisation, while the free radical species are detoxified by a vulnerable series of antioxidant mechanisms.

CINCHONA ALKALOID

A cinchona alkaloid that relaxes skeletal muscle by increasing the refractory period, decreasing excitability of motor end plates (curare-like), and affecting distribution of calcium with muscle fiber.

BIGUANIDES

Biguanides stimulate AMP-activated protein kinase (AMPK) thereby decreasing blood glucose concentrations by several different actions. They decrease hepatic gluconeogenesis, improve tissue sensitivity to insulin, increase peripheral glucose uptake and use, and decrease intestinal absorption of glucose.

DIAMINOPYRIMIDINE

Trimethoprim) Mode of action: Inhibition of other metabolic processes. Trimethoprim interferes with folic acid pathway by binding the enzyme dihydrofolate reductase.

8-AMINOQUINOLINE

The mode of action of primaquine, an 8-aminoquinoline, is not understood but two potential mechanisms have been described. The 8-aminoquinolines inhibit the function of DNA in a way distinct from that associated with the 4-aminoquinolines.

SULFONAMIDES

Sulfonamides interfere with folic acid synthesis by preventing addition of para-aminobenzoic acid (PABA) into the folic acid molecule through competing for the enzyme dihydropteroate synthetase.

ANTIBIOTICS

Antibacterial action generally falls within one of four mechanisms, three of which involve the inhibition or regulation of enzymes involved in cell wall biosynthesis, nucleic acid metabolism and repair, or protein synthesis, respectively. The fourth mechanism involves the disruption of membrane structure. Many of these cellular functions targeted by antibiotics are most active in multiplying cells. Since there is often overlap in these functions between prokaryotic bacterial cells and eukaryotic mammalian cells, it is not surprising that some antibiotics have also been found to be useful as anticancer agents.

SESQUITERPENE

Sesquiterpene molecules deliver oxygen molecules to cells, like hemoglobin does in the blood. Sesquiterpenes can also erase or deprogram miswritten codes in the DNA.

NAPHTHOQUINONE

Naphthoquinone diospyrin is an inhibitor of DNA gyrase with a novel mechanism of action. ... Our evidence strongly suggests that the compounds bind to the N-terminal domain of GyrB, which contains the ATPase active site, but are not competitive inhibitors of the ATPase reaction.