Fluoroquinolones Toxicities

Fluoroquinolones are a family of broad spectrum antibiotic drugs that commonly end with suffix floxacin like ciprofloxacin and moxifloxacin. These drugs are bactericidal and eradiate bacteria by interfering with DNA replication. Fluroquinolones inhibit topoisomerase II enzymes including bacterial DNA gyrase. These enzymes cut both strands of the DNA helix in order to unwind DNA tangles and supercoils which is necessary for proper DNA replication. These drugs are broad spectrum antibiotics that play an important role in the treatment of serious bacterial infections, especially against gram negative rod infections. Fluoroquinolones, especially ciprofloxacin, is commonly used in the treatment of urinary tract infections and also used in the treatment of Psuedomonas and Neisseria infections. Products containing multivalent cations, like aluminum or magnesium containing antacids, result in drastic reduction of oral absorption and should not be taken together. In general, adverse effects to fluoroquinolones are generally mild to moderate and include diarrhea, skin rashes, and headaches. On occasion, more serious adverse effects can occur. Fluoroquinolones can damage cartilage and ligaments and can cause spontaneous tendon rupture. They are also associated with fibromyalgia like symptoms including leg cramps and myalgias in children. Because they can damage cartilage and ligaments, they are not recommended for use in pregnant women or children and are considered a teratogen.



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Diarrhea
Toilet
GI disturbances are the most common side effect of fluoroquinolones and include nausea, vomiting, diarrhea, and abdominal pain. These adverse effects occur in about 2-20% of individuals taking fluoroquinolones.

Skin Rash
Dermatologist Examining Rash
A wide range of skin rashes have been reported with fluoroquinolone use including photosensitivity reactions to life threatening reactions like Stevens Johnson syndrome.

Headache
Head-egg Lump
CNS side effects have been reported with fluoroquinolone use including headache and a wide range of adverse psychiatric effects including anxiety, panic attacks, and depression.

Tendon Rupture in Adults
Achilles tendon rupture
A rare but serious adverse reaction with fluoroquinolones is spontaneous tendon rupture in adults. The Achilles tendon is the most common tendon affected and individuals taking concurrent corticosteroid therapy are at highest risk.

Myalgias in Kids
Child with Mayo-algae
Fluoroquinolones can cause fibromyalgia-like symptoms, especially in children. Common complaints include arthralgia, myalgia and leg cramps for all drugs within the class.

Damage to Cartilage
Cartilage-cart
Fluoroquinolones can damage cartilage and ligaments and therefore are not recommended for use in pregnant women or children.

Teratogen
Tarantula-gem
Teratogens are agents that cause a defect or malformation in the development of the embryo or fetus. Fluoroquinolones are considered teratogens because they can damage cartilage and ligaments. Therefore, they are not recommended for use in pregnant women or children.

QT Prolongation
QT-heart Prolonged
Fluoroquinolones prolong the heart's QT interval by blocking voltage-gated potassium channels. Prolongation of the QT interval can lead to torsades de pointes, a life-threatening arrhythmia, but in practice this appears relatively uncommon in part because the most widely prescribed fluoroquinolones (ciprofloxacin and levofloxacin) only minimally prolong the QT interval.

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