CHLOROQUINE

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Chloroquine was first discovered in 1934 in the German laboratory of Hans Andersag, however it wasn't until 1949 when it was approved by the FDA as an effective drug against malaria. Although its initial use was for treatment of malaria, the drug has found a home in the dermatological field and is used to treat a variety of skin conditions that are refractory to standard medications. Chloroquine is quickly absorbed in its oral form, partially metabolized by the liver, and excreted in the urine. The effect peaks after 1-2 hours of ingestion, and it has a terminal elimination half-life of 1-2 months since it is stored and trapped in lysosomes.

Mechanism: The exact mechanism of chloroquine is unknown but there are many postulated theories. An important component of red blood cells, heme, is broken down by parasites. Chloroquine prevents the degradation of heme, and is actually toxic to the parasite. It only works to kill the parasitic form living in red blood cells, and an additional drug is needed to kill the parasitic form that resides in the liver. In the treatment of other systemic conditions, chloroquine raises the pH of vacuoles once the drug crosses the vacuolar membrane. Autoantigens, which are the main culprit in autoimmune disease, work best at an acidic pH. Therefore, chloroquine helps to decrease the effect of autoantigens. Furthermore, studies have shown that the inflammation associated with many autoimmune diseases is caused by pro-inflammatory cytokines like Il-1, Il-6, and TNF-alpha. Chloroquine inhibits these cytokines, which helps to decrease inflammation.

Uses: Chloroquine is used for both the prevention and treatment of malaria. For those traveling to countries where malaria is an epidemic, it is recommended to take the drug 1-2 weeks before traveling until 4 weeks after leaving the destination. The drug works against the malarial species Plasmodium ovale, P. malariae, P. knowlesi, and some strains of P. falciparum and P. vivax. Chloroquine is also effective against treating a wide variety of systemic diseases with dermatological manifestations including:

- Rheumatoid arthritis
- **Systemic** and **discoid lupus erythematosis**
- **Scleroderma**
- **Pemphigus**
- **Lichen planus**
- **Dermatomyositis**
- **Sarcoidosis**
- **Porphyria cutanea tarda**

It can be used alone or synergistically with corticosteroids. For patients with SLE, treatment with chloroquine for 3 months has shown to decrease the mean level of cytokines Il-6, Il-18, and TNF-alpha. It has been shown not only to treat the dermatological manifestations of SLE, but also to improve muscle pain and fatigue, prevent pericarditis and pleuritis, and prolong longevity. Chloroquine is also the drug of choice for prophylaxis and treatment of pregnant women with malarial infections, however it is a pregnancy category Class C drug. It is recommended that pregnant women speak with their doctor to make a decision of using chloroquine therapy.

Side Effects: The most common side effects include nausea, diarrhea, dizziness, blurred vision, itchiness, sleep disturbances, headaches, alopecia, stomach pain, abnormal skin pigmentation, and photosensitivity. One of the most serious effects includes retinopathy. The metabolite of chloroquine can be toxic to the retina, where it has been found to accumulate. However, this effect has not been recognized in those who take the recommended dose for a period of less than 10 years. Nevertheless, it is recommended to see an ophthalmologist once a year to check for retinal deposits. Less common side effects include abnormal

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ECG tracings, prolonged QT interval, amnesia, seizures, aplastic anemia, agranulocytosis and pancytopenia. Caution should be used in patients who already have psoriasis, since chloroquine can worsen psoriasis. Those with retinal and visual changes, G6PD deficiency, and hearing or hepatic impairment should also take caution. Chloroquine should not be taken with dronedarone, pimozide, or toremifene, which can cause arrhythmias if taken together.