Chloroquine: A Drug With Multiple Uses

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Abstract:

Chloroquine besides being an antimalarial, has been used in rheumatoid arthritis, primary Gougerot-Sjogren, Photo lesions, necrobiosis lipoidica, verrucous from of chilblain, Lupus erythematosus, subacute cutaneous lupus arthrematosus, lupus pregnancy, porphyria cutanea tarda, & lepromatous reaction, extra-intestinal amoebiasis, photo reactions and infections mononucleosis. Resistance to chloroquine is being developed for treatment of malaria. Chloroquine may produce toxicity and adverse effects like halos around the eyes, photophobia, retinopathy, maculopathy and sensorineural hearing loss have been reported. Other adverse effects include pruritus, intermittent porphyria, arrhythmias and mental disturbances. It may also produce achromotrichia albinum, transient, edema, exfoliative dermatitis & fixed drug eruptions.

Introduction:

Chloroquine is rapidly acting erythrocytic schizonticide; it controls most of the clinical attacks in 1 to 2 days with disappearance of parasites from peripheral blood. It has no effect on pre and o xo-erythrocytic phase of schizony. Also it does not prevent relapses in vivax and ovale malaria. Mechanism of action of chloroquine is not clearly known. It is actively concentrated by sensitive intraerythrocytic plasmodia, higher concentrations are found in the infected RBCs. Probably by accumulating in the acidic vesicles of the parasites and because of its weak basic nature, it raises the vesicular PH and thereby with degradation of hemoglobin by the parasitic lysosomes, clumping of pigment and changes in the parasitic membrane follow.

Uses of Chloroquine:

Chloroquine is the drug of choice for clinical cure and suppressive prophylaxis of all types of malaria except that caused by resistant P. falciparum. It completely cures sensitive falciparum disease but reapse in vivax and ovale malaria are not prevented though the interval between relapses is increased. Individuals visiting endemic areas should have suppressive dose of antimalarial one week before and continue for 10 weeks after return.

Chloroquine is not only an antimalarial it can also be used in another ailments. In rheumatoid arthritis it has been proven effective. Data from studies have been analyzed for the treatment of rheumatoid arthritis.

Presence of certain HLA Class II antigens is strongly associated with progressive joint destruction in rheumatoid arthritis, some such antigens may be more effective than other Class II antigens in inducing the formation of autoreactive T. Cell after presentation of antigens, treatment was done with chloroquine and other antirheumatic drugs, it was concluded that early and aggressive antirheumatic drug treatment affects association of HLA Class II alleles with progression of joint damage in the rheumatoid arthritis⁴.

In a study efficacy of minocycline with that of a conventional disease modifying antirheumatic drug, hydroxychloroquine in patients with early seropositive rheumatoid arthritis. This study was performed on sixty patients, the result were that minocycline treated patients were more likely to achieve a response at years compared with hydroxychloroquine group⁵. The effect of delayed and early treatment in patients with rheumatoid arthritis was compared. The median log to the initiation of disease modifying treatment was 15 days in the early treatment group and 123 days in the delayed treatment group. There was less joint damage after 2 years in the early treatment group compared with delayed treatment group⁶.

A case has been reported who developed rheumatoid arthritis after alpha interferon therapy and was treated with chloroquine and NSAIDS with partial response⁷. An audit of the use of antirheumatic drugs in a North Indian referral hospital was done, the most frequently prescribed drug. Chloroquine was the most commonly used drug⁸.

A case of primary Gougerot-Sjogren syndrome in a 13 years old girl has been, reported who improved well on administration of hydroxychloroquine⁹.

The commercial availability of antigen specific techniques such as enzyme linked immunoabsorbant assay for serum desmoglein autoantibody should eliminate delay in diagnosis.

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Hydrox chloroquine may be another treatment option for those children with photo-distributed lesions. Further experience and long term outcome studies in children are needed to determine whether somemedication side effects may outweigh the risk from the disease itself. A case of necrobiosis lipoidica diabeticorum has been reported who was successfully cured with oral chloroquine. A case of 45 years old woman with verrucous forms of chilblain lupus erythematosus, was successfully managed by methyl prednisolone and hydroxychloroquine. After one year therapy a new skin biopsy revealed a substantial reduction of hyperkeratosis and hyaline degeneration of collagen tissue in the perivascular areas. The combination of the extensive hyperkeratosis and hyalinization, this seems to be a feature of the long lasting untreated lesions in chilblain lupus erythematosus.

A patient has been reported suffering from subacute cutaneous lupus erythematosus who developed classified nodules that were histopathologically consistent with lupus perniculitis, she was treated with a contribution and diltiazem with good therapeutic response. The addition of diltiazem happened to be beneficial in patients with classified nodules of lupus panniculitis.

According to a study of hydroxychloroquine in lupus pregnancy in a group of patients, beneficial effects were achieved and decreased in prednisolone dose with no detriment to patients health.

Porphyria cutanea tarda has been treated with low doses chloroquine twice weekly but venesection should be used in patients with severe iron overload, long term follow up is needed in all patients to monitor relapse.

Chloroquine has been used to treat lepra reaction, a case has been reported developing seizures on chloroquine therapy in lepra reaction, the seizures were controlled with phynytain.

Chloroquine is far less effective in extra-intestinal amoebiasis, effective in photogenic reaction and infections mononucleosis where it gives symptomatic relief.

Chloroquine Resistant Malaria:

Chloroquine resistance among plasmodia has been shown in developing countries. Drug resistance malaria has posed a major problem, in malaria control. Resistance to sulfadoxine-pyrimethamine and to mefloquine was also prevalent on the Thai-Cambodian and Thai-Maynma (Thai-Burmese) borders rendering them established multi-drug-resistant areas. Chloroquine resistance spread across Africa during 1980 and severe resistance was especially found in East Africa. As a result more than ten African countries have switched their first line drug to sulfadoxine-pyrimethamine. The efficacy of this drug in Africa is progressively deteriorating especially in foci in East Africa which are classified as emerging. MDR areas. In relation to antimalarial drug resistance Africa carries the greatest burden of disease caused by plasmodium falciparum and it could be expected burden to rise in near future mainly because of the drug resistance. Although effective drugs are available such as artether - lumefantrine mefloquine, atovaquone proguanil and halofantrine, they are uniformly too expensive for routine use. Affordable options include chloroquine plus sulfadoxine pyrimethamine, amodiaquine in combination with with sulfadoxine + pyrimethamine and chloroprophuanil - dapsone. Artemisinin in combination therapy may offer considerable advantages over alternative therapies but its introduction faces considerable logistic difficulty.

Resistance to the malaria treatment chloroquine, and pyrimethamine - sulfadoxine is problem in East-Africa, considering this view point an alternative drug allocation study to access the efficacy of chloroprophuanil - dapsone in the treatment of falciparum malaria was done it was concluded that chloroprophuanil - dapsone was a practicable therapy under the circumstances.

Toxicity and adverse effects:

Chloroquine is usually well tolerated even with prolonged use but may develop adverse effects. Corneal deposits of chloroquine may be symptomatic or may cause halos around the eyes or photophobia may develop. A case has been presented in with chloroquine toxicity developed after eight years of malaria prophylaxis at a cumulative dose and the individual developed retinopathy. Macular toxicity was also observed.

Ophthalmic examination was done in 21 children born to women who took chloroquine during pregnancy the mean duration of gestational exposure was 7.2 months and no ophthalmic abnormality was detected in these children. Therapeutic Use of these drugs (chloroquine) during pregnancy may not pose a significant risk of ocular toxicity to offspring. A case has been reported developing, maculopathy <8 years after starting hydroxylchloroquine therapy for systemic lupus erythematosus. A case of unilateral sensorineural hearing loss in a 7 year old girl with idiopathic
pulmonary haemosiderosis after two years of hydroxychloroquine treatment according to two authors sensorineural hearing loss has previously been reported with hydroxychloroquine treatment, they claim that this was the first report in a child and associated to idiopathic pulmonary haemosiderosis and has the characteristic of being unilateral21.

Other adverse effects include puritus which may be intolerable, headache, gastrointestinal disturbances precipitation of acute intermittent porphyria in susceptible individuals, mental disturbances and interference with cardiac rhythm. Acute over dose may be rapidly fatal. Chloroquine may produce achromotrichia, albinism, dicroomia, transient edema, exofoiative dermatitis, fixed drug eruptions pichem planus like dermatitis, and photosensitization22.

The antidiarreheal agent like kaolin and calcium and magnesium - containing antacids interferewith the absorption of chloroquine and should not be co-administered with these drugs23.

Chloroquine may also rarely produce hemolysisin glucose 6 phosphate dehydrogenase (G6PD) deficient persons24.

Conclusion:

According to the review of the literature it has been concluded that chloroquine can be used for the treatment of many diseases but its prolonged use has to be monitored to avoid toxicity due to cumulative property. However rational therapy should be done.

References:


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