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Hydroxychloroquine concentration in Indian patients with lupus nephritis

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Objectives : Lupus nephritis (LN) is an important risk factor for morbidity and mortality in systemic lupus erythematosus (SLE). Hydroxychloroquine (HCQ) is an integral part of the therapeutic armamentarium for SLE. Data regarding HCQ blood levels and recommended therapeutic cut-offs have not been reliably determined. The present study aims to estimate and correlate HCQ concentrations in whole blood and its components in LN patients in Indian subpopulation.

Methods : Lupus nephritis patients on HCQ therapy for a minimum of 3 months were included in this study. Patients on RRT and pregnant patients were excluded. HCQ blood levels (ng/mL) from EDTA whole blood, plasma and serum were measured by liquid chromatography-tandem mass spectrometry and correlation among different bio-samples was done. Chloroquine was used as internal standard.

Results : In this cohort study, 180 patients were included with mean age of 26.4±9.5 years and 90.5% being females. The mean HCQ dose was 4.7±1.8 mg/kg. The mean HCQ levels were 584.97±351.61 ng/mL in whole blood, 326.73 ±235.77 ng/mL in plasma and 287.45±210.02 ng/mL in serum. (Figure 1) Whole blood levels with dose of 200 mg/day were lower than 400 mg/day. HCQ plasma concentrations had positive linear correlations with serum concentrations ($r=0.441$ ($p<0.001$)). The mean levels in whole blood were approximately 2-fold the levels in serum and plasma. Nearly one-fifth (39, 19.5%) of the study cohort had levels below LLOQ suggesting drug non-compliance. Among patients with whole-blood HCQ levels below detectable limits, only 15% had detectable serum levels suggesting comparability between various samples for detecting non-adherence.

Conclusions : This is the first Indian study to look at HCQ concentrations in patients with lupus nephritis. Though whole blood levels are ideal for assessment, plasma and serum samples have good correlation and can help in detecting non-adherence. Correlation with clinical features and dosing will help to optimize HCQ dosing suited to local population.

Scatter plot with serum, plasma and whole blood HCQ levels.png

