Hydroxychloroquine-Induced Cardiotoxicity: A Case Series

SC Heyliger (MD Candidate)[1], NL Altman (MD)[2], J Maloney (MD)[3]

1. University of Colorado Anschutz Medical Campus
2. Department of Medicine-Cardiology, University of Colorado Hospital
3. Department of Medicine-Pulmonary Sciences & Critical Care, University of Colorado Hospital

BACKGROUND

- Used frequently in systemic lupus erythematosus (SLE), rheumatoid arthritis (RA), and as an anti-malaria agent.
- Known side effects of retinopathy and neuromyopathy; likely underappreciated cardiotoxicity.
- Inhibits lysosomes by changing pH concentrations leading to accumulation of glycogen and phospholipids causing ventricular hypertrophy and cardiomyopathy.
- Similar structure to Class Ia anti-arrhythmic causing arrhythmias, conduction disorders, and QT prolongation.
- 86 articles from 1963-2017 with 127 documented cases of cardiotoxicity.

PATIENTS/METHODS

- Six females on HCQ for either SLE or RA.
- Mean age of 62 years old.
- Mean length of time on HCQ was 17 years.
- Pre/post echocardiograms obtained after withdrawing HCQ.
- Endomyocardial biopsies taken for pathologic evaluation.

RESULTS

- Mean pre-LVSF of 36%.
- Post-LVSF measurements all improved between 5-10%.
- 100% of patients had an electrocardiac abnormality.
- 100% of patients with cardiomyocyte degradation with vacuolization and lysosomal inclusions.
- Two thirds of the patients with pathognomonic findings of curvilinear bodies.

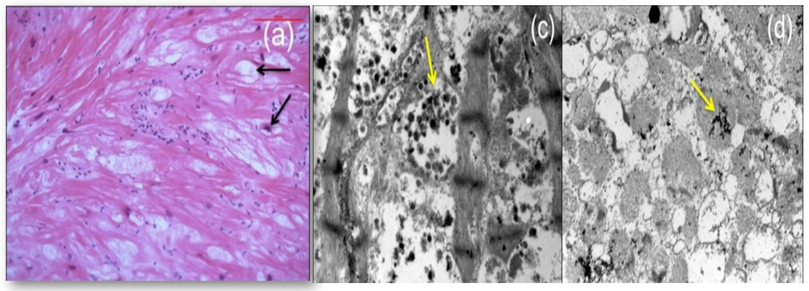
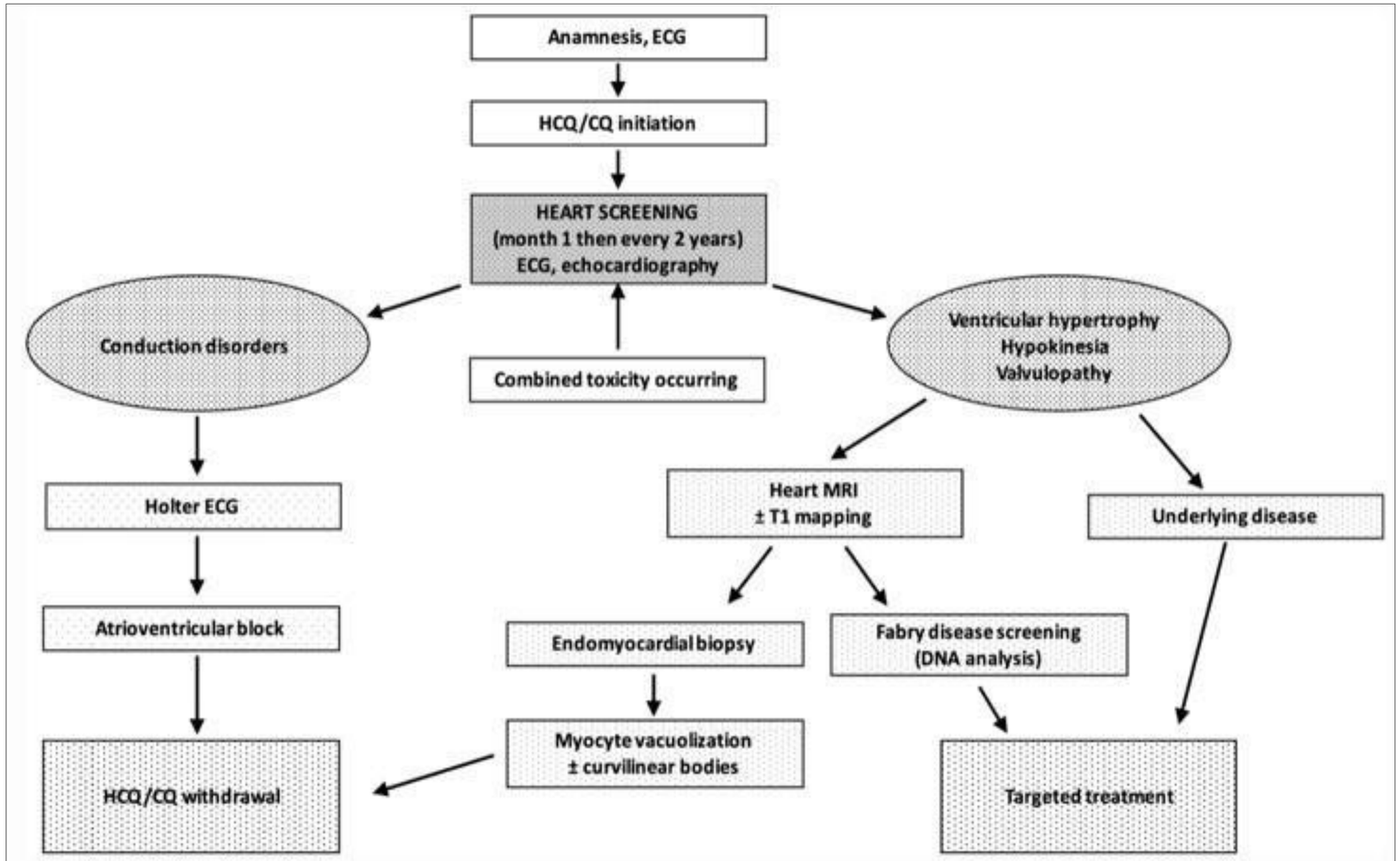


Figure A: Example of light microscopy with myocyte hypertrophy and focal myocyte damage with vacuolization of the cardiomyocytes.
Figures C/D: Examples of electron microscopy showing cytoplasmic inclusion bodies, rounded aggregates of dark osmiophilic staining bodies, some of which contain curvilinear and lamellar character.



Monitoring proposal for patients treated with chloroquine/hydroxychloroquine (CQ/HCQ). Combined toxicity occurrence (neuromyopathy, retinopathy) should lead to a thorough cardiac follow-up. *ECG* electrocardiography, *MRI* magnetic resonance imaging

Figure 2: Proposed algorithm and subsequent monitoring/testing when placing a patient on HCQ.

LIMITATIONS

- Small sample size.
- Single center study.
- Cofounding effects of other immunosuppressants.
- HCQ-induced versus rheumatologic association.

CONCLUSIONS

- Rare, but potentially fatal.
- High mimicry of other causes of cardiomyopathy.
- Accurate diagnosis with correlation of clinical history and pathologic evaluation.
- Screening and subsequent follow up.
- More data needed to determine true prevalence and potential predictive factors of poor outcomes.

University of Colorado
Anschutz Medical Campus