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Importance of Hydroxychloroquine Retinopathy Monitoring

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ABSTRACT/INTRODUCTION

Hydroxychloroquine (HCQ) is a 4-aminoquinoline drug originally developed as an antimalarial and still used for prevention and treatment of malaria.[1] In modern clinical practice, it is widely used as a disease-modifying anti-rheumatic drug (DMARD) for the long-term management of inflammatory rheumatological and dermatological conditions, including rheumatoid arthritis and systemic lupus erythematosus.[2] While generally well tolerated, HCQ is associated with recognised adverse effects such as hepatotoxicity, cardiomyopathy, and retinal toxicity.[2] Hydroxychloroquine-induced retinopathy is of particular clinical concern because retinal damage is often irreversible and may progress even after treatment cessation.[1,2]

Keywords: Hydroxychloroquine (HCQ); Drug; Malaria

BACKGROUND

HCQ retinopathy results from damage to photoreceptors and the retinal pigment epithelium (RPE), leading to characteristic parafoveal or pericentral changes and, in advanced disease, bull's-eye maculopathy.[2] The prevalence of HCQ retinopathy increases with cumulative exposure. The Royal College of Ophthalmologists (RCOphth) estimates a prevalence of approximately 7.5% after long-term use, rising to 20–50% after 20 years depending on daily dose and duration of therapy.[1]

Guidelines

The RCOphth recommends annual retinal monitoring for patients receiving HCQ:

- after five years of continuous therapy, or
- earlier in high-risk patients, including those:
    - receiving doses exceeding 5 mg/kg/day
    - with renal impairment
    - taking tamoxifen
    - prescribed chloroquine[1]

Recommended screening modalities include spectral-domain optical coherence tomography (SD-OCT) and fundus autofluorescence (FAF) to facilitate early detection of retinal changes[1].

METHODS

This retrospective audit reviewed 20 patients undergoing HCQ retinopathy monitoring at South Warwickshire Hospital (SWFT). Data were assessed against RCOphth monitoring standards. Parameters evaluated included documentation of:

- HCQ therapy start date
- patient weight
- prescribed dose
- duration of therapy
- concurrent tamoxifen use
- renal function

Information was extracted from ophthalmology records and referral documentation.

RESULTS

Documentation of HCQ therapy start date was complete in ophthalmology records (100%) but present in only 70% of referrals. Patient weight was not documented in any ophthalmology records and was recorded in only 5% of referrals. HCQ dose was absent from ophthalmology documentation but present in 85% of referrals. Duration of therapy was consistently recorded in ophthalmology records but missing in 40% of referral documents. Tamoxifen use and renal function were fully documented within ophthalmology records (100%); however, renal function was absent in 95% of referral documentation.

DISCUSSION

This audit identified key deficiencies in the documentation of weight, HCQ dose, renal function, and therapy duration—parameters that are essential for accurate risk stratification and prevention of retinal toxicity in long-term HCQ users. Incomplete documentation may compromise clinicians' ability to identify high-risk patients and initiate timely intervention.

Inadequate patient counselling regarding ocular risks and the importance of monitoring also remains a significant concern. Evidence from a UK rheumatology audit demonstrated that formal documentation of counselling on ocular complications was present in only one-third of patients receiving HCQ for longer than five years, despite guideline recommendations[3]. Effective patient education is essential to promote adherence to monitoring programmes and facilitate early symptom reporting.

Large cohort studies further underscore the multifactorial nature of HCQ retinopathy risk. Melles et al. reported a cumulative retinopathy risk of approximately 8.6% after 15 years of HCQ use, with progressively higher risk associated with increased weight-based dosing[4]. Similarly, Jorge et al. identified age, female sex, chronic kidney disease, and tamoxifen use as independent risk factors for HCQ retinopathy.[3,4,5]

Notably, HCQ-induced retinal toxicity can progress even after cessation of therapy. This is because HCQ accumulates in the retinal pigment epithelium (RPE) and binds to melanin, resulting in persistent drug exposure

within retinal tissue.[1,2] Damage to photoreceptors and the RPE is largely irreversible, so structural and functional retinal deterioration may continue despite discontinuation of the drug. These mechanisms highlight the need for continued ophthalmic monitoring after stopping HCQ, particularly in patients with long-term or high-dose exposure.

Taken together, the findings from this audit mirror wider evidence demonstrating persistent gaps in documentation and counselling, despite clear national guidance and increasing recognition of HCQ-associated retinal toxicity.

RECOMMENDATIONS

Improved documentation may be achieved through structured data capture within nurse-led monitoring clinics and standardised clinic letter templates. The introduction of electronic prompts or tick-box fields for therapy duration, dose, weight, and renal function could improve compliance with RCOphth standards. Integrating these prompts within shared electronic records accessible to general practitioners may further support identification of missing data and reduce the risk of preventable long-term adverse outcomes.

CONCLUSION

This audit highlights significant gaps in clinical documentation relative to RCOphth monitoring standards for hydroxychloroquine retinopathy. Addressing these deficiencies through structured data capture and improved interdisciplinary communication may enhance patient safety and support earlier detection of HCQ-associated retinal toxicity.

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