Journal of Clinical & Experimental Ophthalmology
ISSN: 2155-9570

Yip and Sanjay. J Clinic Experiment Ophthalmol 2011, 2:1
DOI: 10.4172/2155-9570.1000128

Research Article Open Access

# Corneal Manifestations of Chronic Systemic Drug Therapy

**Vivien Cherng Hui Yip[1,2,3] and Srinivasan Sanjay[1,2,3]***

[1]Department of Ophthalmology and Visual Sciences, Alexandra Hospital, Singapore
[2]Department of Ophthalmology and Visual Sciences, Khoo Teck Puat Hospital, Singapore
[3]Eye Clinic, Jurong Medical Centre, Singapore

## Abstract

We report 2 cases of incidental ocular pathology secondary to systemic drug therapy. Two male patients aged 67 and 66 of Malay and Indian origin respectively presented to the eye clinic for routine eye evaluation for diabetic retinopathy. On eye evaluation, both patients were found incidentally to have corneal deposits secondary to chronic ingestion of amiodarone and chlorpromazine respectively. Both these medications are known to have ocular side effects. The Malay patient had additional lenticular deposits secondary to chlorpromazine. These drug-induced deposits can be visually significant and in some cases irreversible. We herein describe the ocular manifestations of amiodarone and chlorpromazine in these 2 patients respectively with the aim to increase awareness and highlight the importance of ophthalmic review for patients on chronic medications with known ocular side effects.

**Keywords:** Systemic drugs; Corneal deposits; Lenticular deposits; Amiodarone; Chlorpromazine

## Introduction

A comprehensive history including drug history is essential in an ophthalmic consult. Drug induced eye conditions are a common reason for referrals to the ophthalmology outpatient clinic. A wide-spectrum of medications can cause pathology in the eye, leading to possible impairment of vision. We highlight the importance of this by reporting 2 patients with incidental findings of drug-induced deposits on the anterior and posterior corneal surface.

## Case report 1

A 67 year old Indian man presented to the Department of Ophthalmology and Visual Sciences, Alexandra Hospital with a history of floaters in the right eye for a month. The patient mentioned that he had medications prescribed from India for diabetes and hypertension. His Snellen best corrected visual acuity was 6/6 in the right eye and 6/7.5 in the left eye. Ophthalmic examination revealed bilateral vortex keratopathy and diffuse pigmented deposits in the corneal endothelial layer. Colour and red-free photographs of the anterior segment of both eyes (Figure 1) revealed symmetrical fine greyish opacities in a whorl-like pattern at the inferior corneal epithelium, resembling cat whiskers and sparing the limbus. There was posterior vitreous detachment in the right eye but fundus examination was otherwise unremarkable. Patient was on metformin, glibencamide, lisinopril, amlodipine and amiodarone. The patient had been started on 200mg Amiodarone twice a day in India for cardiac protection though the patient had no history of angina or arrhythmias. He was referred for cardiac evaluation, here in Singapore with the view of possible role and if necessary cessation of amiodarone. Patient was also educated about the ophthalmic side effects of amiodarone including possible optic neuropathy which is not dose related.

## Case report 2

A 66 year old Malay man, with a history of chronic schizophrenia was newly diagnosed with Type 2 Diabetes. He was referred by the Institute of Mental Health to the Department of Ophthalmology and Visual Sciences, Alexandra Hospital for diabetic eye screening in April 2005. His Snellen best corrected visual acuity then was 6/7.5 in both eyes. The ophthalmic examination was normal and he had no diabetic retinopathy. Two years later he was noted incidentally to have corneal and lenticular deposits in both eyes which increased on subsequent visits, initially affecting just the central-lower zone of the cornea then progressed to involve the entire central zone. These were attributed to chlorpromazine which he had been taking since 2005 at 100mg in the morning and 200mg in the evening. Slit lamp photographs of both eyes revealed stellate anterior subcapsular opacities (Figure 2a) and a slit beam through the cornea demonstrates pigment dusting of the endothelium (Figure2b). Despite this, his vision remained at 6/7.5 in both eyes.

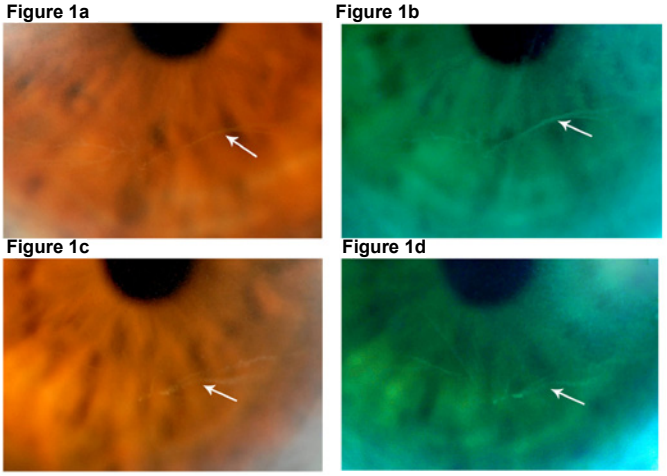


**Figure 1: a,b)** Colour and red-free photograph of the left eye showing whorl-like corneal deposits inferiorly. White arrow points to the lesion. **c,d)** Colour and red-free photograph of the left eye showing whorl-like corneal deposits inferiorly. White arrow points to the lesion.

***Corresponding author:** Sanjay Srinivasan, Khoo Teck Puat Hospital, 90 Yishun Central, Singapore 768828, Tel: 6566023283; Fax: 6566023725; E-mail: sanjay_s@alexandrahealth.sg

**Received** November 07, 2010; **Accepted** December 13, 2010; **Published** December 14, 2010

**Citation:** Yip VCH, Sanjay S (2011) Corneal Manifestations of Chronic Systemic Drug Therapy. J Clinic Experiment Ophthalmol 2:128. doi:10.4172/2155-9570.1000128

**Figure 2a** **Figure 2b**

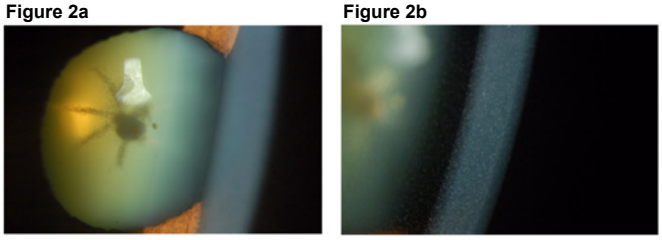

**Figure 2: a)** Slitlamp view of the right eye showing characteristic stellate cataract with dense dustlike brown-yellow granular deposits along the suture lines in the anterior pole of the lens. **b)** Slitlamp view of the right eySe showing fine, discrete, refractile deposits on the corneal endothelium.

## Discussion

Amiodarone keratopathy is a known side effect and can be classified in terms of severity and extent of the deposits. The most severe form is characterised by whorl-like grayish golden-brown opacities with arborising lines which may involve the visual axis [1]. The pathogenesis of amiodarone keratopathy is thought to result from the accumulation of lipid bearing intralysosomal inclusions in the basal layer of the corneal epithelium [2]. Amiodarone keratopathy is dose related and more severe in patients on higher dose and longer duration of treatment [3]. It presents in more than 97% of patients receiving 200 to 300 mg amiodarone daily and 99% of patients receiving 200 to 1200 mg amiodarone, 5 days per week [4,5].

Such deposits rarely impair vision although some patients may complain of haloes around lights. Corneal deposits of patients with amiodarone keratopathy are often seen in the corneal epithelium and rarely involve the endothelial layer. The first case of corneal endothelium deposits secondary to Amiodarone was reported by Erdermus et al. [6] Diffuse deposition in the corneal endothelium was determined with confocal scanning laser microscope, showing bright microdeposits in the cytoplasm of each endothelial cell. Our patient (Case Report 1) also had amiodarone induced deposits present in both the corneal epithelium and endothelium. His initial complaint of floaters was a red herring as the examination revealed amiodarone ocular toxicity involving the endothelium, which may be indicative of a more severe toxicity. Although our patient had good visual acuity, these findings prompted a detailed history and examination as to the indication for Amiodarone. These deposits are reversible and can resolve with cessation of amiodarone [7].

Our second patient (Case Report 2) who presented with corneal and lenticular deposits was also an incidental finding. This patient had chronic schizophrenia and was on long-term chlorpromazine. Chlorpromazine is known to cause corneal deposits and anterior capsular cataracts appear to be dose related and is largely irreversible [8,9]. It can cause significant drop in visual acuity and skin discolouration of sun-exposed areas [10]. Pigmentary retinopathy is usually associated with a high dose of Chlorpromazine of 2400 mg/day [11]. Chlorpromazine deposits in retinal pigment epithelium secondary to its photosensitizing effect on melanin containing cells, leads to retinal pigment epithelium damage and visual impairment. Patients on long-term chlorpromazine treatment need to be monitored for signs of ocular toxicity and fundoscopy should be routinely performed. The medication should be altered or dosage of chlorpromazine decreased if visual acuity is impaired.

## Conclusion

In view of these recent cases of systemic drugs producing ocular toxicity, the clinician must bear in mind the differential diagnosis of drug-induced ocular toxicity when examining a patient with ocular pathology. These 2 examples of drug induced ocular toxicity illustrate the importance of taking a comprehensive history, recognizing the possible side effects of medications and conducting follow-up ophthalmic examinations for patients on long-term medications that are known to impair vision.

### References

1. Miller HA (1969) Keratopathy following treatment with cordarone Bull Soc Ophthalmol. 69: 1059-1060.
2. D'Amico DJ, Kenyon KR, Ruskin JN (1981) Amiodarone keratopathy: drug-induced lipid storage disease. Arch Ophthalmol 99: 257-261.
3. Kaplan LJ, Cappaert WE (1982) Amiodarone keratopathy: Correlation to dosage and duration. Arch Ophthalmol 100: 601-602.
4. Ingram DV, Jaggarao NS, Chamberlain DA (1982) Ocular changes resulting from therapy with amiodarone. Br J Ophthalmol 66: 67-69.
5. Ghosh M, McCulloch C (1984) Amiodarone-induced ultrastructural changes in human eyes. Can J Ophthalmol 19: 178-186.
6. Erdurmus M, Selcoki Y, Yagci R, Hepsen IP (2008) Amiodarone-induced keratopathy: full-thickness corneal involvement. Eye Contact Lens 34: 131-132
7. Mantyjarvi M, Tuppurainen Kllaheimo K (1998) Ocular side effects of amiodarone. Surv Ophthalmol 42: 360-366
8. Isaac NE, Walker AM, Jick H, Gorman H (1991) Exposure to phenothiazine drugs and risk of cataract. Arch Ophthalmol 109: 256-260.
9. Rasmussen K, Kirk L, Faurbye A (1976) Deposits in the lens and cornea of the eye during long-term chlorpromazine medication. Acta Psychiatr Scand 53: 1-6.
10. Webber SK, Domniz Y, Sutton GL, Rogers CM, Lawless MA (2001) Corneal deposition after high dose chlorpromazine hydrochloride therapy. Cornea 20: 217-219.
11. Siddall JR (1966) Ocular toxic changes associated with chlorpromazine and thioridazine. Can J Ophthalmol. 1: 190-198.