Title: It’s Not Rare If It’s In Your Chair: A Case of Cytomegalovirus Retinitis in a Hospital Setting

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General Topic: Ocular Disease

Primary Topic: Posterior Segment

Abstract: The initiation of Highly Active Antiretroviral Therapy has made Cytomegalovirus retinitis a rare clinical finding. The infrequency at which it is encountered makes the management of CMV Retinitis challenging, which constitutes the need for review.

I. Case History

❖ Patient demographics
  ➢ 32 year old Hispanic male

❖ Chief complaint
  ➢ Optometry in-patient consult: c/o decreased distance and near vision OD for the past 2 weeks

❖ Ocular, medical history
  ➢ Pertinent Ocular History
    ▪ LEE: Unknown as per patient. No h/o ocular or visual problems per patient
  ➢ Medical History:
    ▪ (+) AIDS; diagnosed 01/2014, not currently on Highly Active Anti-retroviral therapy (HAART); CD4 count: 2
    ▪ (+) pseudohypothyroidism
    ▪ (-) HTN, DM
  ➢ Other pertinent information: Pt diagnosed with AIDS 01/2014; at that time, the patient did not seek HAART treatment and was hospitalized 07/09/2014 due to tachycardia, fever, oral thrush and seborrheic dermatitis. The patient’s CD4 Lymphocyte count upon admission to the hospital was 2.

❖ II. Pertinent findings
  ➢ Clinical
    ▪ Entering VAs without specs (patient on isolation measures in hospital bed)
      OD: 20/40 PHNI
      OS: 20/20
    ▪ Pupils: PERRL (-) APD OU
    ▪ Extra ocular muscles: full without restrictions OU
    ▪ Tonometry (Tonopen with one gtt proparacaine 0.5% and NaFl strip)
      OD: 18 mmHg
OS: 12 mmHg

Physical

- Slit Lamp Exam
  - Lids/Lashes: clear OU
  - Conjunctiva: clear OU
  - Cornea: OD: inferior punctate staining OS: clear
  - Iris: flat and intact OU
  - Angles: 4/4 OU
  - Anterior Chamber: Deep and Quiet OU
- Dilated Fundus Exam (1 gtt 1% Tropicamide, 1 gtt 2.5% Phenylephrine)
  - Lens: Clear OU
  - Vitreous: Clear OU
  - C/D:
    - OD C/D: 0.50; round, pink, distinct
    - OS: C/D: 0.50; round, pink, distinct
  - Vessels:
    - Attenuated vessels with scattered blot hemorrhages OU
  - Periphery:
    - OD: large area (~7-8 DD) of retinal whitening with scattered hemorrhages inferior 180 degrees extending to inferior arcades
    - OS: scattered round hemorrhages inferior temporal; one 0.5 DD round Roth spot superior temporal to optic nerve head

III. Differential diagnosis

- Primary/Leading: Cytomegalovirus retinitis OD
- Other:
  - HIV retinopathy OU
  - Hypertensive retinopathy
  - Diabetic retinopathy

IV. Diagnosis and discussion

- Elaborate on the Condition

  - Cytomegalovirus (CMV) is part of the herpesvirus family. CMV retinitis is an opportunistic infection that can manifest in AIDS patients with a CD4 lymphocyte count of 100 or less and presents as a viral necrotizing retinitis with a characteristic clinical appearance (3). Due to the initiation of Highly Active Antiretroviral Therapy (HAART), CMV retinitis is rare, but still presents in populations who do not seek treatment when diagnosed HIV positive.
  - CMV infects the vascular endothelium of all the retinal cells and retinal pigment epithelial (RPE) cells. The virus first gains access to the vascular endothelium and subsequently spreads to the perivascular glia and other retinal cells (1)
  - There are two types of CMV retinitis. The fulminant form, which can involve the macula, has a more intense retinal infiltration with a greater degree of
intraretinal hemorrhage (4). The indolent form is limited to the periphery and appears more granular with less hemorrhage than the fulminant form (4). In both types of presentation, the retinitis tends to follow vessels and spreads centrifugally in a brush-fire fashion with central clearing where the retina has already been completely destroyed. The border of the active retinitis is irregular and small white satellite lesions are highly characteristic (2).

- **Expound on Unique Features:**
  - This patient also presented at his second follow up appointment two weeks later with a decrease in Visual Acuity from 20/40 to 20/80 OD. Macular OCT was performed at and it was found that the patient had a secondary rhegmatogenous macula off retinal detachment OD. Approximately 18-33% of patients with CMV retinitis develop retinal detachments which subsequently must be surgically treated (2).

V. Treatment, management

- **Treatment and response to treatment**
  - I/V Ganciclovir 250 mg i/v q 12 hours with close monitoring of CBC due to side effect of bone marrow suppression was initiated after diagnosis of CMV retinitis. Treatment was initiated after the first Ophthalmology in-patient consult by Dr. Poirier and Dr. Hall (07/11/2014).
  - **Consult #1 with retinal specialist (07/31/2013):** Day 21 of i/v Ganciclovir treatment.
    - **Assessment:** Active CMV retinitis with a secondary rhegmatogenous macula off retinal detachment OD
    - **Plan:** IV Ganciclovir was continued due to active nature of the retinitis. Fundus photos with mydriatic camera and 5 line Raster macular OCT taken.
  - **Retina follow up #2 (08/07/2014).** Day 29 of IV Ganciclovir treatment:
    - **Assessment:** Involved CMV retinitis with secondary rhegmatogenous macular off retinal detachment OD
    - **Plan:** Continue IV Ganciclovir for 1 week, then transition to PO Valganciclovir upon discharge from hospital. Fundus photos with mydriatic camera and 5 line Raster macular OCT taken.
  - **Retina follow up #3 (08/14/2014)**
    - **Assessment:** Involved CMV retinitis with secondary rhegmatogenous macula off retinal detachment OD
    - **Plan:** Clear to discharge patient on Valganciclovir 900 mg BID PO. Referral made to New York Eye and Ear Infirmary for Pars Plana Vitrectomy and retinal detachment repair with oil bubble OD. Fundus photos with mydriatic camera and 5 line Raster macular OCT taken.

VI. Conclusion

- **Clinical Pearls, take away points**
  - When examining HIV positive patients, it is important to note the CD4 lymphocyte count. CMV retinitis is a concern for HIV-infected individuals whose CD4 lymphocytes have fallen below 50, individuals who are currently not on anti-retroviral treatment, or have failed HAART treatment (4).
**Diagnosis:** The gold standard of diagnosis of CMV retinitis is examination of the retina through a dilated pupil by clinician using an indirect ophthalmoscope (2).

**Treatment:** Once CMV retinitis is diagnosed, initiation of HAART and anti-CMV treatment is essential. The standard of care is an induction dose of IV Ganciclovir 5mg/kg BID for two to three weeks or until the retinitis stabilizes or there is documented clearance of virus from the blood as demonstrated by CMV antigenemia assay (5). Ganciclovir dosage must be adjusted in patients with renal insufficiency, so monitoring of creatinine clearance is important. The greatest side effects of treatment is bone marrow suppression, thus blood counts (CBC with differential) must be monitored twice a week during the induction dose and once a week during maintenance therapy (4). After involution of the CMV retinitis, the patient may transition to induction dose of oral Valganciclovir 900 mg PO QD for two weeks then maintenance dose of 900 mg PO QD (5). Valganciclovir is an oral prodrug of Ganciclovir that has superior bioavailability as compared to Ganciclovir. 61% of Valganciclovir is readily available from the GI tract as compared to 5% for oral Ganciclovir.

Other treatments that are not first line due to greater side effects include IV Foscarnet, IV Cidofovir, intraocular injections of Ganciclovir and Ganciclovir implants. Serious side effects include renal toxicity with Foscarnet and risk of vitreous hemorrhage, retinal detachment and endophthalmitis with implants (4).

**Complications:** 18-33 percent of eyes with CMV retinitis develop a rhegmatogenous retinal detachment due to multiple necrotic holes. Method of treatment depends on the status of the macula and activity of the retinitis (5). Pars plana vitrectomy with silicone oil tamponade is useful for macula-off retinal detachments in the setting of active retinitis. Vitrectomy with gas tapenade may be used if the retinitis is not active (5).

**Follow up:** Anti CMV therapy should be maintained until patients have been compliant with HAART for 18 months, CD4 counts are greater than 100 for at least 3 months, and the retinitis is involuted without relapse (4).

Many patients that have active CMV retinitis may not be symptomatic; therefore those patients with CD4 counts less than 50 should have a dilated fundus exam every 3 months (4). Patients also should be advised on the importance of compliance with HAART and other anti-CMV medications. Maintaining or increasing CD4 lymphocyte count to 100 or more may be cause for discontinuation of anti-CMV retinitis treatment (4).

**Conclusion:** Since the introduction of HAART in 1987, the prevalence of CMV retinitis had decreased greatly. Although HAART therapy is available, CMV retinitis is still prevalent in approximately 8 per 10,000 of HIV or AIDS cases in the United States (6). This can be attributed to the inaccessibility, inadequacy and resistance to HAART that still exists in developed countries (7). The prevalence of CMV retinitis is also increased in uneducated, low income and illiterate populations, which leads to missed follow up and non-compliance with treatment (2). As Optometrists, it is important to know that CMV retinitis does still exist in the United States and
it is important to be educated on the diagnosis, treatment and follow up protocols for CMV retinitis.

References:


5. Fishman, Jay A M.D; *Guidelines for Therapy of Cytomegalovirus Infection*; Drug Therapy Committee of the Massachusetts General Hospital and the Massachusetts General Physicians Organization; Volume XII, Issue I
