Microperimetry Results of Fresh & Resolved Cotton Wool Spots in a Patient Using Peginterferon Alpha for the Treatment of Hepatitis C Virus

LCDR Megan Clausen, OD, NOSC Tucson, Resident AY2011-2012
Alyon J. Wasik, OD, FAAO VA Tucson Medical Center, Arizona

Abstract: 56 year old hypertensive male has worsening of cotton wool spots after initiation of peginterferon and ribavirin. Microperimetry, which measures retinal light sensitivity, can document the scotoma and decreased surrounding retinal sensitivity caused by CWSs.

I. Case History
A. Patient Demographics: 56 year old Caucasian male
B. Chief Complaint:
   1. Blur at distance with spectacles
C. Pertinent Ocular History:
   1. Physiological tortuosity of artery at optic nerve OS
   2. Isolated CWS OD secondary to HTN (though BP 100/70) and/or mild anemia found two months ago at LEE
      a. BCVA: OD, OS 20/20
   3. Internal hordeolum right lower lid
D. Pertinent Medical History:
   1. Chronic hepatitis C virus
   2. Hypertension
   3. Anemia
   4. Polysubstance abuse
E. Current Medication:
   1. Atenolol
   2. Lisinopril
   3. Trazodone
   4. Peginterferon alfa-2A
   5. Ribavirin
F. Other Salient Information:
   1. None

II. Pertinent Findings
A. BCVA: OD 20/25, OS 20/20
B. Pupils: ERRL, no APD
C. Anterior segment: unremarkable
D. Dilated fundus exam:
   a. OD two CWSs infero-temporal just sup to arcade; two CWSs inferior to disc; one CWS supero-temporal within arcade
      OS unremarkable
   i. Started peginterferon alfa-2A 180 ug/0.5ml per week and ribavirin 600mg a day one week earlier
E. Six week follow-up:
a. OD - increased number of CWSs along superior and inferior arcades and surrounding disc
b. OS - several CWSs in superior and inferior arcades primarily near disc and few nasal to disc
c. Stable visual acuity OD/OS

F. Peginterferon and ribavirin stopped six days later after a total of eight weeks of therapy due to ocular findings
   a. 11 week follow-up: few CWSs starting to resolve

G. Laboratory studies:
   a. Consistently low hemoglobin (11.5), hematocrit (34.6), and RBCs (3.83)
   b. Fasting glucose WNL (83), hA1c WNL (5.2)
   c. HIV screening & Hepatitis B surface antigen: negative
d. Hepatitis C viral load: 1247184
   i. Genotype: 1a
   ii. Biopsy
      1. Fibrosis: stage 3 / Inflammation: grade 3

H. Radiology studies:
   a. None

I. Specialized testing:
   a. OCT Cirrus Macular Cube:
      i. Localized hyperreflection and thickening of inner retina consistent with CWSs OD, OS
   b. Microperimetry (MP-1):
      i. Focal light sensitivity testing at and around OD CWSs revealed reduced sensitivity overlying CWS and in the surrounding retina
   c. HVF SS 24-2
      i. OD scattered edge defects, OS sup lid defect

III. Differential Diagnosis
   A. Primary/Leading differentials:
      1. Hypertensive retinopathy
   B. Secondary differentials:
      1. Diabetic retinopathy
      2. Blood dyscrasia (e.g., anemia, leukemia, lymphoma)
      3. Carotid artery stenosis
      4. Collagen-vascular disease (e.g., systemic lupus erythematosus)
      5. Retinal artery or vein occlusion
      6. AIDS retinopathy

IV. Diagnosis and Discussion
   A. Worsening of CWS due to peginterferon & ribavirin treatment for hepatitis C virus
      1. 18-86% of patients treated with interferon develop retinopathy. This risk is increased in patients with hypertension and other vascular disorders.
      2. Typically interferon retinopathy is self limiting with no ocular complications though our patient developed mild vision loss and as a result the treatment was discontinued by the prescribing physician
3. Resolution of CWSs typically occurs in 4 to 12 weeks as in our patient

B. Microperimeter MP-1, Nidek Technologies, Italy
1. Target lights are directed at particular retinal locations allowing for more specific visual field testing. The MP-1 will only display target lights if the patient is fixating at the target and is in proper alignment
   i. Eye movements are tracked utilizing the live retinal image to ensure the target lights are displayed at the correct site
2. Microperimetry can be repeated on the same retinal location through the software placing the fixation target at the same location and utilizing retinal features to re-align the stimuli location
3. A customized pattern was used with a Goldman III target and a 4-2 threshold strategy

V. Treatment and Management
   A. Discontinuation of peginterferon and ribavirin
      a. Notification of prescribing physician
   B. Patient education
   C. Photodocumentation of posterior segment findings
   D. Visual field and microperimetry to monitor impact on vision during and after resolution of cotton wool spots
   E. Continued treatment of hypertension and anemia

VI. Conclusion
   A. The patient had a transitory decrease in visual acuity and nonspecific defects on Humphrey Visual Field testing. Microperimetry revealed scotomas associated with cotton wool spots.
   B. Cotton wool spots can leave lasting changes to the nerve fiber layer but studies vary in whether the scotoma present in active CWSs continues after the resolution of the infarct. Continued microperimetry testing (to be repeated at next follow-up visit) will reveal whether this patient’s scotomas resolve with the resolution of the cotton wool spots.

Bibliography:

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